CONSTRUCTION SPECIFICATIONS

CONSTRUCTION DOCUMENTS TECHNICAL SPECIFICATIONS FOR THE CONSTRUCTION OF

HEWN TIMBER CABINS REFURBISHMENT FOR FRANCIS MARION UNIVERSITY FLORENCE, SOUTH CAROLINA

FW ARCHITECT'S COMM. NO. 2115

OSE PROJECT # H18-9583-SG-A

AUGUST 2022



FWARCHITECTS, INC. A.I.A. ARCHITECTURE • PLANNING • INTERIORS P.O. BOX 2261 FLORENCE, SOUTH CAROLINA THIS PAGE LEFT INTENTIONALLY BLANK

DATED **August 2022** ARCHITECT'S COMM. NO. 2115

HEWN TIMBER CABINS REFURBISHMENT FOR FRANCIS MARION UNIVERSITY **FLORENCE, SOUTH CAROLINA**

PROJECT# H18-9583-SG-A



NOTE: TO GENERAL CONTRACTORS, SUBCONTRACTORS AND ALL MATERIAL SUPPLIERS: THERE SHALL BE NO ASBESTOS CONTAINING MATERIAL USED IN THE CONSTRUCTION OF THIS PROJECT IN ANY FORM WHATSOEVER.

NOTE: ALL CONSTRUCTION MUST MEET ALL SEISMIC REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE.

> F W ARCHITECTS, INC., AIA POST OFFICE BOX 2261 **1550 WEST EVANS STREET** FLORENCE, SOUTH CAROLINA 29503

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PROJECT TEAM LIST

HEWN TIMBER CABIN REFURBISHMENT FOR FRANCIS MARION UNIVERSITY

Florence, South Carolina Project Number: H18-9583-SG-A

OWNER:

Francis Marion University 4822 East Palmetto Street Florence, South Carolina 29506

ARCHITECT OF RECORD:

FW Architects, Inc. PO Box 2261 Florence, SC 29503 (843) 662-9961

CIVIL ENGINEER:

Ervin Engineering Co.

PO Box 3 Florence, SC 29503 (843) 662-4941

STRUCTURAL ENGINEER:

M. Padgett Engineering & Construction, LLC PO Box 6996 Florence, SC 29502 (843) 908-4569

MECHANICAL ENGINEER & ELECTRICAL ENGINEER:

M. Padgett Engineering & Construction, LLC PO Box 6996 Florence, SC 29502 (843) 908-4569

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

AGENCY/OWNER: Francis Marion University PROJECT NAME: Hewn Timber Cabins Refurbishment PROJECT NUMBER: H18-9583-SG-A CONSTRUCT	
PROJECT NAME: <u>Hewn Timber Cabins Refurbishment</u> PROJECT NUMBER: <u>H18-9583-SG-A</u> CONSTRUCT	
PROJECT NUMBER: <u>H18-9583-SG-A</u> CONSTRUCT	
	FION COST RANGE: \$ 250,000 to \$ 275,000
PROJECT LOCATION: 4822 E. Plametto Street, Florence, SC	с
DESCRIPTION OF PROJECT/SERVICES: Construct a 940	0 sq. ft. open air exposed timber education structure with sma
conditioned storage room. Slab on grade with single slope roof.	Provide 1 off-street gravel bus parking space, sidewalks an
outdoor kiosks. Cemetary to have brick paver entrance walk, ben	iches and 2 monolithic plaque holders.
BID/SUBMITTAL DUE DATE: 11/15/2022 TIM	ME: NUMBER OF COPIES:
PROJECT DELIVERY METHOD: Design-Bid-Build	
AGENCY PROJECT COORDINATOR: Taylor Hucks	
EMAIL: taylor.hucks@fmarion.edu	TELEPHONE: (843) 661-1488
DOCUMENTS MAY BE OBTAINED FROM: https://www.f	fmarion.edu/facilitiesmanagement/
BID SECURITY IS REQUIRED IN AN AMOUNT NOT LE	SS THAN 5% OF THE BASE BID.
PERFORMANCE AND LABOR & MATERIAL PAYMENT	BONDS: The successful Contactor will be required to provide
Performance and Labor and Material Payment Bonds, each in the	e amount of 100% of the Contract Price.
DOCUMENT DEPOSIT AMOUNT: \$ 0.00 IS	S DEPOSIT REFUNDABLE Yes 🗌 No 🗍 N/A 🛛
Bidders must obtain Bidding Documents/Plans from the above listed source(s) to any other source do so at their own risk. All written communications with officie	be listed as an official plan holder. Bidders that rely on copies obtained from a plan holder \mathcal{K} hidders will be via small or vehicle posting
Agency WILL NOT accent Bids sent via email.	al plan noiders de bidders will be via eman of website posting.
All questions & correspondence concerning this Invitation shall be addressed to	the A/E.
A/E NAME: Mark Palmer	A/E CONTACT: PO Box 2261 Florence, SC 29503
EMAIL: mpalmer@fw-architects.com	TELEPHONE: (843) 662-9961
PRE-BID CONFERENCE: Yes 🗋 No 🖾	MANDATORY ATTENDANCE: Yes 🗌 No 🛛
PRE-BID DATE:	TIME:
PRE-BID PLACE:	
BID OPENING PLACE: Francis Marion Facilities Manageme	ent Building - 4822 E. Plametto Street, Florence, SC 29502
BID DELIVERY ADDRESSES:	
HAND-DELIVERY:	MAIL SERVICE:
Attn: Taylor Hucks	Attn: Taylor Hucks
4822 E. Palmetto Street	4822 E. Palmetto Street
Florence SC 29502	Florence, SC 29502
1010100, 00 27302	

South Carolina Division of Procurement Services, Office of State Engineer Version of MAIA Document A701[™] – 2018

Instructions to Bidders

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

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South Carolina Division of Procurement Services, Office of State Engineer Version of MAIA Document A701[™] – 2018

Instructions to Bidders

for the following Project: (Name, State Project Number, location, and detailed description) Hewn Timber Cabins Refurbishment H18-9583-SG-A

4822 E. Palmetto St., Florence SC 29502 (A new 940 sq. ft. open-air, exposed timber, education structure with a small conditioned storage room and site amenities. The cemetery is to have a brick paver walk and site amenities.)

THE OWNER:

(Name, legal status, address, and other information) Francis Marion University (Attn: Taylor Hucks) 4822 E. Palmeto Street Florence SC 29502 Telephone: 843-661-1488

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) FW Architects, Inc. 1550 West Evans Street Florence SC 29501 Attn: Mark Palmer (843-662-9961)

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- 2 BIDDER'S REPRESENTATIONS
- 3 BIDDING DOCUMENTS
- 4 BIDDING PROCEDURES
- 5 CONSIDERATION OF BIDS
- 6 POST-BID INFORMATION
- 7 PERFORMANCE BOND AND PAYMENT BOND

8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

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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: FMU physical plant bulletin board

Building Where Posted: FMU physical plant

Address of Building: 4822 E. Palmetto Street, Florence SC 29502

WEB site address (if applicable): https://www.fmarion.edu/facilitiesmanagement/

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

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§ 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.

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 A101TM–2017, Exhibit A, Insurance and Bonds, SCOSE Version.

Title

.3 AIA Document A201TM-2017, General Conditions of the Contract for Construction, SCOSE Version.
 .4 Drawings

Number

.5 Specifications

Section

Title

Date

Date

Pages

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.6	Addenda:			
	Number	Date	Pages	
7	Other Exhibits: (Check all boxes that	apply and include appropriate info	ormation identifying the exhibit where r	equired.)
	AIA Document E203 [™] –2013, Building Information Modeling and Digital Data Exhibit, dated indicated below:			
	AIA Document E204 [™] –2017, Sustainable Projects Exhibit, dated as indicated below:			
	The Sustaina	bility Plan:		
	Supplementa	ry and other Conditions of the Contr	ract:	

.8 Other documents listed below:

(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

ARTICLE 9 Miscellaneous

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

BI	D SUBMITTED BY:			
	(Bidder's Name)			
BI	D SUBMITTED TO: Francis Marion University			
	(Agency's Name)			
FO	R: PROJECT NAME: Hewn Timber Cabins Refurbishment			
	PROJECT NUMBER: H18-9583-SG-A			
<u>OF</u>	FER			
§ 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 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 $\underline{60}$ 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):			
	S, which sum is hereafter called the Base Bid. (Bidder to insert Base Bid Amount on line above)			

§ 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			
			ŝ	
	ALTE	CRNATE #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.

2021 Edition

§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 <u>150</u> Calendar Days from the Date of Commencement, subject to adjustments as provided in the Contract Documents.

b) LIQUIDATED DAMAGES

Bidder further agrees that from the compensation to be paid, the Agency shall retain as Liquidated Damages the amount of \$_500.00______ for each Calendar Day the actual construction time required to achieve Substantial Completion exceeds the specified or adjusted time for Substantial Completion as provided in the Contract Documents. This amount is intended by the parties as the predetermined measure of compensation for actual damages, not as a penalty for nonperformance.

§ 10. AGREEMENTS

- a) Bidder agrees that this bid is subject to the requirements of the laws of the State of South Carolina.
- b) Bidder agrees that at any time prior to the issuance of the Notice to Proceed for this Project, this Project may be canceled for the convenience of, and without cost to, the State.
- c) Bidder agrees that neither the State of South Carolina nor any of its agencies, employees or agents shall be responsible for any bid preparation costs, or any costs or charges of any type, should all bids be rejected or the Project canceled for any reason prior to the issuance of the Notice to Proceed.

§ 11. ELECTRONIC BID BOND

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

ELECTRONIC BID BOND NUMBER: _____

SIGNATURE AND TITLE:

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 MAIA 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 ATA 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 in the year (In words, indicate day, month and year.) day of

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

Francis Marion University 4822 E. Palmetto Street Florence SC 29502

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)

Hewn Timber Cabins Refurbishment

H18-9583-SG-A 4822 E. Palmetto St., Florence SC 29502

(A new 940 sq.ft. open-air, exposed timber, education structure with a small conditioned storage room and site amenities. The cemetery is to have a brick paver walk and site amenities.

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

FW Architects, Inc. 1550 West Evans Street Florence SC 29501 Attn: Mark Palmer (843-662-9961)

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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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The Owner and Contractor agree as follows.

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TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
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- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

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

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

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

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

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work within the Contract Time indicated in the Notice to Proceed.

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

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ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum, including all accepted alternates indicated in the bid documents, in current funds for the Contractor's performance of the Contract. The Contract Sum shall be

(\$

), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates that are accepted, if any, included in the Contract Sum: (Insert the accepted Alternates.)

Item

Price

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

Item

Price

§ 4.4 Unit prices, if any:

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

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

§ 4.5 Liquidated damages

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

§ 4.6 Other:

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

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ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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

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

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

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

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

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

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

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

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

§ 5.1.7 Retainage

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

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

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

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

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

§ 5.2 Final Payment

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

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

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

ARTICLE 6 DISPUTE RESOLUTION

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

ARTICLE 7 TERMINATION OR SUSPENSION

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

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

ARTICLE 8 MISCELLANEOUS PROVISIONS

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

§ 8.2 The Owner's representative:

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

Name: Darryl L. Bridges Title: VP Finance & Facilities - FMU Address: 4822 E. Palmetto St., Florence SC 29502 Telephone: 843-661-1110 Email: dbridges@fmarion.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: Taylor Hucks Title: Project Manager - FMU Address: 4822 E. Palmetto Str., Florence SC 29502 Telephone: 843-661-1488 Email: taylor.hucks@fmarion.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: Dennis S. Ward, FAIA, NCARB
Title: President
Address: 1550 West Evans Str., Florence SC 29501 (PO Box 2261, Florence SC 29502)
Telephone: 843-662-9961
Email: dward@fw-architects.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 primaveratype format satisfactory to the Owner and the Architect that shall also (1) provide a graphic representation of all activities and events that will occur during performance of the Work; (2) identify each phase of construction and occupancy; and (3) set forth milestone dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents.

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

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- .2 The Contactor shall monitor the progress of the Work for conformance with the requirements of the Construction Schedule and shall promptly advise the Owner of any delays or potential delays. Whenever the Construction Schedule no longer reflects actual conditions and progress of the Work or the Contract Time is modified in accordance with the terms of the Contract Documents, the Contractor shall update the Construction Schedule to reflect such conditions.
- .3 In the event any progress report indicates any delays, the Contractor shall propose an affirmative plan to correct the delay, including overtime and/or additional labor, if necessary.
- .4 In no event shall any progress report constitute an adjustment in the Contract Time, any milestone date, or the Contract Sum unless any such adjustment is agreed to by the Owner and authorized pursuant to Change Order.

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

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101®–2017, SCOSE Version Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101[®]-2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201®-2017, SCOSE Version General Conditions of the Contract for Construction
- .4 Form SE-390, Notice to Proceed Construction Contract
- .5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number

Date

Pages

Init.

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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 E204TM–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 Cond	litions of the Contract:		
Docu	ument	Title	Date	Pages

.9 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201®–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

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

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

OWNER (Signature)

CONTRACTOR (Signature)

(Printed name and title)

(Printed name and title)

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

Insurance and Bonds

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

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

Hewn Timber Cabins Refurbishment H18-9583-SG-A 4822 E. Palmetto St., Florence SC 29502

THE OWNER: (Name, legal status and address)

Francis Marion University 4822 E. Palmetto Street Florence SC 29502

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

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.

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§ 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 selfinsured 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

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

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§ 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.

§ 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.

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§ 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

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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.)

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.3.2 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 Payment Bond Performance Bond Penal Sum (\$0.00) 100% of Contract Price 100% of Contract Price

§ 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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General Conditions of the Contract for Construction

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

General Conditions of the Contract for Construction

for the following PROJECT:

(Name, State Project Number, and location or address)

Hewn Timber Cabins Refurbishment H18-9583-SG-A 4822 E. Palmetto St., Florence SC 29502

THE OWNER:

(Name, legal status, and address)

Francis Marion University 4822 E. Palmetto Street Florence SC 29502

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)

FW Architects, Inc. 1550 West Evans Street Florence SC 29501

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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.
- 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

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 E203TM-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

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

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

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§ 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.

§ 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 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.

§ 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, 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.

§ 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 his 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 State Fire Marshal. The EOR will complete the Office of State Fire Marshal (OSFM) form "Request for Fire Sprinkler System Shop Review for State Construction Projects" and submit it to OSE for signature.
- .3 OSE will sign the form and return it to the Architect's EOR. The EOR will submit a copy of the signed form with the approved shop drawings to OSFM for review and approval; and, forward a copy of each to OSE.
- .4 Upon receipt of the OSFM approval letter, the EOR will forward a copy of the letter to the Owner, Contractor, Architect, and OSE.
- .5 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 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 hamless 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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§ 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.

AlA Document A201°-2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007, and 2017 by The American Institute of Architects. All rights reserved. South Carolina Division of Procurement Services, Office of State Engineer Version of AlA Document A201°-2017. Copyright © 2016 and 2020 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AlA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was created on under the terms of AIA Documents on Demand[®] Order No. 2114372750, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents[®] Documents[®] Documents-on-Demand – End User License Agreement. To report copyright violations, e-mail copyright@aia.org. § 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

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§ 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

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

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

- .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

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 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.

AIA Document A201°-2017. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997, 2007, and 2017 by The American Institute of Architects. All rights reserved. South Carolina Division of Procurement Services, Office of State Engineer Version of AIA Document A201°-2017. Copyright © 2016 and 2020 by The American Institute of Architects. All rights reserved. The "American Institute of Architects," "AIA," the AIA Logo, "A201," and "AIA Contract Documents" are registered trademarks and may not be used without permission. This document was created on under the terms of AIA Documents on Demand® Order No. 2114372750, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Documents•on-Demand – End User License Agreement. To report copyright violations, e-mail copyright@aia.org. § 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 Any change in the Work initiated after the declaration of Substantial Completion must be approved in writing by the OSE regardless of the amount of the change or 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.

§ 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

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§ 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.

§ 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

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§ 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 reasons for withholding certification and Owner of the Architect's reasons for Section 9.5.1; or (3) withhold 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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§ 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. § 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.

§ 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

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§ 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

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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§ 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 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

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§ 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

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 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 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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§ 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 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.

§ 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; or (b) that Contractor and its subcontractors or sub-subcontractors; or (b) that 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, and (b) include in their contracts 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:

- .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;

- .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

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§ 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

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

SE-355 <u>PERFORMANCE BOND</u>

KNOW ALL Name:	MEN BY THESE PRESENTS, that (Insert full	name or legal title and address of Contractor)			
Address:					
hereinafter ref	Cerred to as "Contractor", and (Insert full name and a	uddress of principal place of business of Surety)			
Name:					
Address:					
hereinafter cal	led the "surety", are jointly and severally held a	and firmly bound unto (Insert full name and address of Agency)			
Name:	FRANCIS MARION UNIVERSITY				
Address:	4822 East Palmetto Street				
	Florence SC 29506				
hereinafter ref of the Bond to administrators	Ferred to as "Agency", or its successors or assign o which payment to be well and truly made, the s, successors and assigns, jointly and severally, f	ns, the sum of, being the sum he Contractor and Surety bind themselves, their heirs, executors, firmly by these presents.			
WHEREAS,	Contractor has by written agreement dated	entered into a contract with Agency to construct			
State Proj	ect Name: <u>HEWN TIMBER CABINS REFURI</u>	BISHMENT			
State Proj	ect Number: <u>H-18-9583-SG-A</u>				
Brief Des	cription of Awarded Work:				
in accordance	with Drawings and Specifications prepared by	(Insert full name and address of A/E)			
Name:	Name: <u>FW ARCHITECTS. INC. AIA</u>				
Address:	1550 West Evans Street				
	Florence SC 29501				
which agreem	ent is by reference made a part hereof, and is he	reinafter referred to as the Contract.			
IN WITNESS each cause thi	S WHEREOF , Surety and Contractor, intending s Performance Bond to be duly executed on its	g to be legally bound hereby, subject to the terms stated herein, do behalf by its authorized officer, agent or representative.			
DATED this (s)	day of, 2022, hall be no earlier than Date of Contract)	BOND NUMBER			
CONTRAC	TOR	SURETY			
By:		Bv:			
<i>u</i>	(Seal)	(Seal)			
Print Name	:	Print Name:			
Print Title:		Print Title:			
		(Attach Power of Attorney)			
Witness:		Witness:			

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

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 ref	erred to as "Contractor", and (Insert full name and address of principal place of business of Surety)
Name:	
Address:	
hereinafter cal	led the "surety", are jointly and severally held and firmly bound unto (Insert full name and address of Agency)
Name:	FRANCIS MARION UNIVERSITY
Address:	4822 E.Palmetto Street
	Florence SC 29506.
hereinafter ref of the Bond to administrators	erred to as "Agency", or its successors or assigns, the sum of(\$), being the sum of which payment to be well and truly made, the Contractor and Surety bind themselves, their heirs, executors, 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 Proj	ect Name: <u>HEWN TIMBER CABINS REFURBISHMENT</u>
State Proj	ect Number: <u>H18-9583-SG-A</u>
Brief Des	cription of Awarded Work:
in accordance	with Drawings and Specifications prepared by (Insert full name and address of A/E)
Name:	FW ARCHITECTS, INC., AIA
Address:	1550 West Evans Street
	Florence SC 29501
which agreem	ent 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 (shall be no earlier than Da	ate of Contract)	BOND NUMBER	
CONTRACTOR		SURETY	
By:	(Seal)	By:	(Seal)
Print Name:		Print Name:	
Print Title:		Print Title:(Attach Power of Attorney)	
Witness:		Witness:	

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

SE-357 LABOR & MATERIAL PAYMENT BOND

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

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

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

- **2.1** Promptly makes payment, directly or indirectly, for all sums due Claimants; and
- **2.2** Defends, indemnifies and holds harmless the Agency from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract.

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

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

- **4.1** Every person who has furnished labor, material or rental equipment to the Contractor or its subcontractors for the work specified in the Contract, and who has not been paid in full therefore before the expiration of a period of ninety (90) days after the date on which the last of the labor was done or performed by him or material or rental equipment was furnished or supplied by him for which such claim is made, shall have the right to sue on the payment bond for the amount, or the balance thereof, unpaid at the time of institution of such suit and to prosecute such action for the sum or sums justly due him.
- **4.2** A remote claimant shall have a right of action on the payment bond upon giving written notice by certified or registered mail to the Contractor within ninety (90) days from the date on which such person did or performed the last of the labor or furnished or supplied the last of the material or rental equipment upon which such claim is made.
- **4.3** Every suit instituted upon a payment bond shall be brought in a court of competent jurisdiction for the county or circuit in which the construction contract was to be performed, but no such suit shall be commenced after the expiration of o ne year after the day on which the last of the labor was performed or material or rental equipment was supplied by the person bringing suit.

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

- **5.1** Send an answer to the Claimant, with a copy to the Agency, within sixty (60) days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.
- 5.2 Pay or arrange for payment of any undisputed amounts.
- **5.3** The Surety's failure to discharge its obligations under this paragraph 5 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a claim. However, if the Surety fails to discharge its obligations under this paragraph 5, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs to recover any sums found to be due and owing to the Claimant.

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

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

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

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

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

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

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

13. DEFINITIONS

- **13.1** Claimant: An individual or entity having a direct contract with the Contractor or with a Subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of the Contractor and the Contractor's Subcontractors, and all other items for which a mechanic's lien might otherwise be asserted.
- **13.2** Remote Claimant: A person having a direct contractual relationship with a subcontractor of the Contractor or subcontractor, but no contractual relationship expressed or implied with the Contractor.
- **13.3** Contract: The agreement between the Agency and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

SE-380 CHANGE ORDER TO DESIGN-BID-BUILD CONTRACT

AGENCY: FRANCIS MARION UNIVERSITY

PROJECT NAME: <u>HEWN TIMBER CABINS REFURBISHMENT</u>

PROJECT NUMBER: H18-9583-SG-A

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:
- 4. Amount of this Change Order:
- 5. New Contract Sum, including this Change Order:

ADJUSTMENTS IN THE CONTRACT TIME:

- 1. Initial Date for Substantial Completion:
- 2. Sum of previously approved increases and decreases in Days:
- 3. Change in Days for this Change Order:

4. Total Number of Days added to this Contract including this Change Order:

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 Cert	ification 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.

\$

\$ 0.00

\$

Days Days 0.00

0 Days

CONTRACT DATE:

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DIVISION NO. 01 – GENERAL REQUIREMENTS OF THE CONTRACT

01 21 00 - ALLOWANCES

PART ONE - GENERAL:

1-01 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.

1-02 SUMMARY:

- A. This Section includes administrative and procedural requirements governing allowances.
 - 1. Selected materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Contingency allowances
 - 2. Landscape Design and Installation allowance.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Modification Procedures" specifies procedures for submitting and handling Change Orders.
 - 2. Division 1 Section "Quality Control Services" specifies procedures governing the use of allowances for inspection and testing.

1-03 SELECTION AND PURCHASE:

- A. At the earliest practical date after award of the Contract, advise the Architect of the date when the final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At the Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by the Architect from the designated supplier.

1-04 SUBMITTALS:

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show the actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1-05 UNUSED MATERIALS:

- A. Return unused materials to the manufacturer or supplier for credit to the Owner, after installation has been completed and accepted.
 - 1. When requested by the Architect, prepare unused material for storage by Owner where it is not economically practical to return the material for credit. When directed by the Architect, deliver unused material to the Owner's storage space. Otherwise, disposal of unused material is the Contractor's responsibility.

PART TWO – PRODUCTS (Not Applicable)

PART THREE – EXECUTION:

3-01 EXAMINATION:

A. Examine products covered by an allowance promptly upon delivery for damage or defects.

3-02 PREPARATION:

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3-03 SCHEDULE OF ALLOWANCES:

- A. <u>Allowance Number One:</u> If needed.
- B. <u>Allowance Number Two:</u> If needed.

End of Section

SECTION 01 23 00 - ALTERNATES

PART ONE - GENERAL:

- **1-01 <u>REQUIREMENTS</u>:** The requirements of all section of Division One apply to work included under this section.
- **1-02** <u>WORK INCLUDED:</u> Furnish all labor and materials necessary to complete alternates indicated, specified or both.
- **1-03 <u>ALTERNATE PRICE</u>:** Each General Contractor shall quote in his bid the amount to be added or deducted to accomplish the Alternate listed below.

PART TWO - ALTERNATES:

2-01 ALTERNATE NUMBER ONE: If needed.

END OF SECTION

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SECTION 01 25 13 - PRODUCT SUBSTITUTIONS

PART ONE - GENERAL

1.1 <u>RELATED DOCUMENTS</u>

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-00 Specification Sections, apply to this Section.

1.2 <u>SUMMARY</u>

- A. This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Contract.
 - 1. Multiple Prime Contracts: Provisions of this Section apply to the construction activities of each prime Contractor.
- B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."
- C. Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.
- D. Procedural requirements governing the Contractor's selection of products and product options are included under Section "Materials and Equipment."

1.3 **DEFINITIONS**

- A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following are not considered substitutions:
 - 1. Substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to Contract Documents requested by the Owner or Architect.
 - 3. Specified options of products and construction methods included in Contract Documents.
 - 4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 <u>SUBMITTALS</u>

- A. Substitution Request Submittal: Requests for substitution will be considered if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of the Architect.
 - 1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.
 - Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
 - b. Samples, where applicable or requested.
 - c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
 - d. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.
 - e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - f. Cost information, including a proposal of the net change, if any in the Contract Sum.
 - g. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.
 - 3. Architect's Action: Within one week of receipt of the request for substitution, the Architect will request additional information or documentation necessary for evaluation of the request. Within 2 weeks of receipt of the request, or one week of receipt of the additional information or documentation, which ever is later, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a Change Order.

PART TWO - PRODUCTS

2.1 <u>SUBSTITUTIONS</u>

- A. Conditions: The Contractor's substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.
 - 1. Extensive revisions to Contract Documents are not required.
 - 2. Proposed changes are in keeping with the general intent of Contract Documents.
 - 3. The request is timely, fully documented and properly submitted.
 - 4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.
 - 5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
 - 6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
 - 7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
 - 8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
 - 9. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
 - 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.
 - 11. Where a proposed substitution involves more than one prime Contractor, each Contractor shall cooperate with the other Contractors involved to coordinate the Work, provide uniformity and consistency, and to assure compatibility of products.
- B. The Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART THREE - EXECUTION (Not Applicable)

END OF SECTION

SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1-01 **DESCRIPTION**

- A. NO EXTRA WORK SHALL BE PERFORMED WITHOUT FIRST RECEIVING WRITTEN APPROVAL FROM THE ARCHITECT.
- B. Work included: Make such changes in the Work, in the Contract Sum, in the Contract Time of Completion, to any combination thereof, as are described in written Construction Change Directives or written Change Orders signed by the Owner and the Architect and issued after execution of the Contract, in accordance with provisions of this Section.
- C. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, AIA Document A201 and Spec Sections 00 72 13-General Conditions and 00 73 00-Extension of General Conditions, found in Division 00 of these Specifications.
 - 2. Changes in the Work are described further in Article 7 of the General Conditions.

1-02 QUALITY ASSURANCE

A. Include within the Contractor's quality assurance program such measures as are needed to assure familiarity of the Contractor's staff and employees with these procedures for processing Change Order data.

1-03 SUBMITTALS

- A. Make submittals directly to the Architect.
- B. Submit the number of copies called for under the various items listed in this Section along with appropriate back-up materials.

1-04 PROCESSING CHANGES INITIATED BY THE OWNER

- A. Should the Owner contemplate making a change in the Work or a change in the Contract Time of Completion, the Architect will issue a Proposed Change Order request or a Construction Change Directive to the Contractor.
 - 1. Proposed Change Order requests will describe the contemplated change and will request that the Contractor provide a detailed price and estimate of time that it seeks in the event the change is authorized by the Owner.
- 2. Construction Change Directives will be dated and will be numbered in sequence.
- 3. The Construction Change Directives will describe the contemplated change, and will carry one of the following instructions to the Contractor:
 - a. Make the described change in the Work at no change in the Contract Sum and no change in the Contract Time of Completion in accordance with Paragraph 7.3 of the General Conditions.
 - b. Make the described change in the Work, and provide for a credit or cost to be determined in accordance with Paragraph 7.3.7 of the General Conditions.
- B. If the Contractor has been directed by the Architect to make the described change in the Work at no change in the Contract Sum and no change in the Contract Time of Completion, but the Contractor wishes to make a claim for one or both of such changes, the Contractor shall proceed with the change and shall notify the Architect as provided for under Article 15.1 of the General Conditions.
- C. If the Contractor has been directed by the Architect to make the described change subject to later determination of cost or credit in accordance with Paragraph 7.3 of the General Conditions, the Contractor shall:
 - 1. Take such measures as needed to make the change;
 - 2. Consult with the Architect and reach agreement on the most appropriate method for determining credit or cost for the change.
- D. If the Contractor has been directed by the Architect to promptly advise him as to credit or cost proposed for the described change, the Contractor shall:
 - 1. Analyze the described change and its impact on costs and time;
 - 2. Secure the required information and forward it to the Architect for review;
 - 3. Meet with the Architect as required to explain costs and, when appropriate, determine other acceptable ways to achieve the desired objective;
 - 4. Alert pertinent personnel and subcontractors as to the impending change and, to the maximum extent possible, avoid such work as would increase the Owner's cost for making the change, advising the Architect in writing when avoidance no longer is practicable.

1-05 PROCESSING CHANGES INITIATED BY THE CONTRACTOR

If the Contractor recommends a change in the Work, he shall submit a Proposed Change Order with detailed cost and time information as detailed below.

1-06 PROCESSING CHANGE ORDERS

CONTRACTOR'S ACTIONS

- A. Make written reply to the Architect in response to each Proposed Change Order request or Construction Change Directive.
 - 1. State proposed change in the Contract Sum, if any.
 - 2. State proposed change in the Contract Time of completion, if any.
 - 3. Clearly describe other changes in the Work required by the proposed change or desirable therewith, if any.
 - 4. Include full backup data such as, subcontractor's letter of proposal or similar information.
 - 5. Submit this response in a single copy.

ARCHITECT'S ACTIONS

- A. When cost of credit for the change has been agreed upon by the Owner and the Contractor, or the Owner has directed that cost or credit be determined in accordance with provisions of Paragraph 7.3 of the General Conditions, the Architect will issue a Change Order or Constructive Change Directive to the Contractor.
- B. Change Orders will be dated and will be numbered in sequence.
- C. The Change Order will describe the change or changes, will refer to the Construction Change Directive(s) involved, and will be signed by the Owner, and the Architect.
- D. The Architect will issue three copies of each Change Order to the Contractor.
 - 1. The Contractor promptly shall sign all three copies and return all three copies to the Architect for the Architect's signature.
 - 2. The Architect will sign all three copies and return three copies to the Owner for the Owner's signature.
 - 3. The Owner will sign all three copies, retain one copy for his file and return the remaining two copies to the Architect who will then forward fully executed copies to the Contractor.
- E. Should the Contractor disagree with the stipulated change in Contract Sum, or change in Contract Time of Completion, or both:
 - 1. The Contractor promptly shall return three copies of the Change Order, unsigned by him, to the Architect with a letter signed by the Contractor's disagreement.
 - 2. The Contractor's disagreement with the Change Order shall not in any way relieve the Contractor of his responsibility to proceed with the change as ordered under pertinent provisions of the Contract Documents.

End of Section

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SECTION 01 29 00 – PAYMENT PROCEDURES

PART ONE - GENERAL

1-01 **DESCRIPTION**

- A. Work included: Comply with procedures described in this Section when applying for progress payment and final payment under the Contract.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, AIA Document A201 and Spec Sections 00 72 13-General Conditions and 00 73 00-Extension of General Conditions, found in Division 00 of these Specifications.
 - 2. The Contract Sum and the schedule for payments are described in the Form of Agreement.
 - 3. Payments upon Substantial Completion and Completion of the Work are described in the AIA General Conditions, as amended and in Division 01 of these Specifications, including General Requirements–01 77 00 Execution and Closeout Procedures.
 - 4. The Architect's approval of applications for progress payment and final payment is contingent upon the Architect's approval of status of Project Record Documents pursuant to the requirements of Section 017839 and the AIA General Conditions, as amended.
 - 5. The Architect's approval of applications for progress payment is contingent upon receipt of Project Schedule updates to be submitted along with each pay application.

1-02 QUALITY ASSURANCE

- A. During progress of the Work, modify the schedule of values as approved by the Architect to reflect changes in the Contract Sum due to Change Orders or other modifications of the Contract.
- B. Base requests for payment on the approved schedule of values.
- C. Payment Application Times: Each progress payment date is as indicated in the Agreement. The period of construction Work covered by each Application or Payment is the period indicated in the Agreement.
- D. Application Preparation: complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Contractor. Incomplete applications will be returned without action.

1-03 SUBMITTALS

- A. Formal Submittal: Unless otherwise directed by the Architect.
 - 1. Make formal submittal of request for payment by filling in all appropriate information, by typewriter or neat lettering in ink, on AIA Document G702, "Application and Certificate for Payment", plus Continuation Sheets, AIA Document G703, using data from the Schedule of Values and the accompanying cost loaded schedule, if applicable. Submit other supporting documentation required by the Architect as detailed by the AIA Documents including, but not limited to, lien waivers, Consent of Surety, etc.
 - 2. Sign and notarize the Application and Certificate for Payment.
 - 3. Submit the original of the Application and Certificate for Payment, plus two (2) identical copies of the entire Application including all continuation sheet or sheets, to the Architect. All copies shall bear original signatures and original notarizations.
 - 4. The Architect will review the formal submittal and, upon approval and agreement, will:
 - a. Retain one copy for the Architect's files and transmit two copies to the Owner.
 - 5. Request for Payment against any change order will not be honored until the change order is signed by all appropriate parties.
- B. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Certificates of Partial Substantial Completion issued previously for Owner occupancy or designated portions of the Work.

Administrative actions and submittal that shall proceed or coincide with this application include:

- 1. Occupancy permits and similar approvals.
- 2. Warranties (guarantees) and maintenance agreements.
- 3. Test/adjust/balance records.
- 4. Maintenance instructions.
- 5. Start-up performance reports.
- 6. Change-over information related to Owner's occupancy, use operation and maintenance.
- 7. Final cleaning.
- 8. Application for reduction of retainage and consent of surety.
- 9. Advice on shifting insurance coverages.
- 10. Punch list of incomplete Work, recognized as exception to Architect's Certificate of Substantial Completion (area by area).
- 11. Change of door locks to Owner's access keys.

- C. Final Payment Application: In conjunction with the requirements of administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:
 - 1. Completion of Project closeout requirements.
 - 2. Completion of items specified for completion after Substantial Completion.
 - 3. A final release which indicates no further claims will be submitted against this contract.
 - 4. Assurance that Work is complete.
 - 5. Transmittal of required Project Construction Records to Owner including all record documents.
 - 6. Proof that all taxes, fees and similar obligations have been paid.
 - 7. All required lien releases/waiver of claims from subcontractors, suppliers and other vendors.
 - 8. Consent of Surety.

END OF SECTION

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SECTION 01 29 73 – SCHEDULE OF VALUES

PART ONE - GENERAL

1-01 **DESCRIPTION**

- A. Work included: Provide a detailed breakdown of the agreed Contract Sum showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to AIA Document A201 and Spec Sections 00 72 13-General Conditions, 00 73 00-Extension of General Conditions, and Sections in Division 1 of these Specifications.
 - 2. Schedule of Values is required to be compatible with the continuation sheet, accompanying applications for payment, as described in Section 012900 Payment Procedures.

1-02 QUALITY ASSURANCE

- A. Use required means to assure arithmetical accuracy of the sums described.
- B. When so required by the Program Manager and/or Architect, provide copies of the subcontractor's Schedule of Values or other data acceptable to the Program Manager and/or Architect, substantiating the sums described.

1-03 SUBMITTALS

- A. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.
 - 1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of the Architect.
 - c. Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed for each construction phase:
 - a. Generic name.
 - b. Related Specification Section.
 - c. Name of subcontractor.

- d. Name of manufacturer or fabricator.
- e. Name of supplier.
- f. Dollar value.
- g. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.
- 3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Break principal subcontract amounts down into several line items.
- 4. Round amounts off to the nearest whole dollar; the total shall equal the Contract Sum.
- 5. For each part of the Work where an Application for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- 6. Allowances: Show line item value of each allowance noted in Section 01 02 00 Cash Allowances.
- 7. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item shall be complete including its total cost and proportionate share of general overhead and profit margin.
 - a. Temporary facilities and other major cost items that are not direct costs of actual work-in-place shall be shown as separate line items in the Schedule of Values.
- 8. Schedule Updating: Update the Schedule of Values when Change Orders or Construction Change Directives result in a change in the Contract Sum.
- B. Prior to first application for payment, submit a proposed schedule of values to the Architect.
 - 1. Meet with the Architect and determine additional data, if any, required to be submitted.
 - 2. Secure the Architect's approval of the schedule of values prior to submitting first application for payment. NO APPLICATIONS FOR PAYMENT WILL BE PROCESSED PRIOR TO APPROVAL OF THE SCHEDULE OF VALUES, as well as other submittals required by contract to accompany payment applications.

END OF SECTION

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART ONE - GENERAL

1-01 RELATED DOCUMENTS

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

1-02 <u>SUMMARY</u>

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Schedule. (See Section 01 32 16)
 - 2. Submittals Schedule.
 - 3. Daily construction reports.
 - 4. Material location reports.
 - 5. Field condition reports.
 - 6. Special reports.
- B. Specific requirements of each contract are also indicated in individual Specification Sections, All Bid Documents and on Drawings.
- C. Daily Construction Reports: Submitted Daily to architect & Owner, in a format as defined by Owner (including electronic formats such as Primavera Expedition).
- D. Material Location Reports: Submit as required by architect & Owner.
- E. Field Condition Reports: Submitted to Architect & Owner, in a format as defined by architect & Owner, (including electronic formats such as Primavera Expedition).
- F. Special Reports: Submitted per occurrence to Architect and Owner's Representative in a format as defined by architect & Owner (including electronic formats such as Primavera Expedition).

1-03 QUALITY ASSURANCE

1. Photographer Qualifications: Digital photos of high quality taken by the General Contractor are acceptable.

1-04 <u>COORDINATION</u>

A. Auxiliary Services: Cooperate with other trades, architect & Owner, and provide auxiliary services requested, including access to Project site and use of temporary facilities including temporary lighting.

1-05 ACTION ITEMS

A. Green Globes Action Items: Provide meeting agendas/minutes/attendance for any design phase meetings held with the projects team and/or Owner.

PART 2 - PRODUCTS

2-01 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. Show submittals on the Preliminary Construction Schedule.
 - b. Submittals must be logged and maintained in a format as defined by architect & Owner (including electronic formats such as Primavera Expedition).

2-02 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

(For specific information – refer to Specification Section 01 32 16)

- 1. Phasing: Arrange list of activities on schedule by phase.
- 2. Work under More Than One Contract: Include a separate activity for each contract.
- 3. Work by The Owner: Include a separate activity for each portion of the Work performed by The Owner.
- 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date. Delivery dates indicated stipulate the earliest possible delivery date.

- 5. The Owner-Furnished Products: Include a separate activity for each product. Include delivery date. Delivery dates indicated stipulate the earliest possible delivery date.
- 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion. (Show staff occupying the building to set up classes & stocking at least 30 days prior to the contract substantial completion date).
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
- 7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - I. Startup and placement into final use and operation.
- 8. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
 - a. Structural completion.
 - b. Permanent space enclosure.
 - c. Completion of mechanical installation.
 - d. Completion of electrical installation.
 - e. Substantial Completion.
- 9. Responsibilities: Identify each activity according to the responsibility for that activity. Responsibilities categorization of activities shall include
 - a. The Owner
 - b. Architect
 - c. City or County Agency having jurisdiction
 - d. General Contractor
 - e. Mechanical Contractor
 - f. Plumbing Contractor

- g. HVAC Contractor
- h. Electrical Contractor
- i. Technology Contractor
- j. Others having prime contracts

The purpose of this responsibility is to sort the schedule by entities having prime agreements with The Owner, Architect, agencies having jurisdiction. Establish secondary responsibilities in a separate activity definition for the purposes of sorting by subcontractors for the contractor's convenience.

2-03 <u>REPORTS</u>

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. High and low temperatures and general weather conditions.
 - 5. Accidents.
 - 6. Meetings and significant decisions.
 - 7. Unusual events (refer to special reports).
 - 8. Stoppages, delays, shortages, and losses.
 - 9. Meter readings and similar recordings.
 - 10. Emergency procedures.
 - 11. Orders and requests of authorities having jurisdiction.
 - 12. Change Orders received and implemented.
 - 13. Construction Change Directives received.
 - 14. Services connected and disconnected.
 - 15. Equipment or system tests and startups.
 - 16. Partial Completions and occupancies.
 - 17. Substantial Completions authorized.
- B. Material Location Reports: At intervals as required by the architect & Owner, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information on Primavera Expedition. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2-04 SPECIAL REPORTS

- A. General: Submit special reports directly to architect & Owner, within one day of an occurrence. Distribute copies of report to parties affected by the occurrence by way of Primavera Expedition.
- 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, and response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise architect & Owner in advance when these events are known or predictable.

End of Section

C.

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SECTION 01 32 16 – CONSTRUCTION SCHEDULES AND REPORTS

1-01 GENERAL REQUIREMENTS

- A. The work under this contract shall be planned, scheduled, executed and reported using the Critical Path Method (hereinafter referred to as: CPM), pursuant to the provisions of the General Conditions. Any deviation between this scheduling specification and the General Conditions shall be governed by the more stringent spec at the full discretion of the Architect & Owner.
- B. The primary objectives of the project scheduling program are to insure the adequate planning, scheduling and execution of the construction activities so they may be prosecuted in an orderly and expeditious manner, within the Contract Time and the milestones stipulated by the Contract, to provide optimum coordination between contractors, to establish the basis for measuring and monitoring individual contractor progress and overall project progress, to detect problems for the purpose of taking corrective action to maintain the scheduled program and to provide a mechanism or tool for determining and monitoring such corrective actions.
- C. Any schedule templates prepared for this project by the owner are made available by the Owner solely as an aid to the Contractor. Anv construction plan depicted in the schedule template may not optimize, and it is not intended to optimize, the Bidder's costs or resources. It is intended that these schedules will reflect the milestones and completion dates established by the Owner. However, the services provided by the Architect & Owner, the existence of schedules, networks, or any other charts or services prepared or performed by the Architect & Owner shall in no way relieve the General Contractor of the responsibility of complying with all of the requirements of the Contract Documents, including but not limited to the responsibility of completing the Work within the Contract Time and the responsibility of planning, scheduling and coordinating the work. The Contractor is required to comply with all control procedures specified herein and with any reasonable changes that may be necessary, in the opinion of the Architect & Owner, or that are provided to the contractor regarding key dates, during the contract duration.
- D. Any and all milestone or specific Dates listed in these specifications, or else where in the Contract Documents, represent only the major items of construction/erection work or interface dates. The milestone completion dates indicated are considered essential to the satisfactory performance of this Contract and to the coordination of all work on the project.

The milestone dates listed are not intended to be a complete listing of all work under this Contract or of all interfaces with other project contractors.

The milestone dates listed represent the latest allowable completion dates. Earlier completion dates may be established as agreed by the General Contractor, Architect & Owner.

E. If the Contractor should desire or intend to complete the work earlier than any required Milestone or Completion date, the Architect & Owner shall not be liable to the Contractor for any costs or other damages should the contractor be unable to complete the Work before such Milestone or Completion date. The duties, obligations and warranties of the Owner to the Contractor shall be consistent with and applicable only to the completion of the Work on the Milestone and completion dates required in the Owner-Contractor Agreement, unless the Owner and Contractor otherwise agree in writing.

F. THE GENERAL CONSTRUCTION CONTRACTOR IS THE PROJECT EXPEDITER / COORDINATOR AND HAS THE DUTY OF SCHEDULE PREPARATION, COORDINATION, UPDATING & REPORTING.

1-02 PRE-BID

- A. The Owner reserves the right to the following prior to the receipt of bids:
 - 1. Architect & Owner, or a third party scheduling consultant may prepare a Preliminary Provisional Network, which displays a construction plan to complete the Project in compliance with Specific Dates listed in the Bid Documents..
 - a. The Architect & Owner & make no warranty or representation either express or implied, as to the reasonableness of or feasibility of the fact that this Preliminary Provisional Network may be a complete listing of all of the Work activities required by this Contract.
 - b. Each Bidder is under the obligation of reviewing and analyzing the Preliminary Provisional Network and determining its feasibility and reasonableness with regard to the activities required by the Contract Documents, the duration of such activities and the sequence of work required in order to complete the work within the contract time.
 - 2. At the sole discretion of the Owner the Architect & Owner may conduct a Pre-Bid Conference to familiarize bidders with the Project and the Preliminary Provisional Network, if supplied.

1-03 POST AWARD ACTIVITIES

A. The Contractor shall perform the following after receipt of the Notice to Proceed:

Immediately following the receipt of Notice to Proceed, the General Contractor shall commence the preparation of the Detailed Construction Schedule. In this respect and prior to the next meeting with the Architect & Owner, the Contractor shall assemble, with the assistance of his Subcontractors and Suppliers, information regarding the project that includes but is not limited to:

- 1. A Detailed Construction Schedule that represents the Contractor's best judgment in how he shall prosecute and complete the work in compliance with the Contract Milestone Dates and any Specific Dates stipulated in the General Conditions or other contract documents.
- 2. The identity and duration of all activities to be included in this construction plan shall meet the following criteria:
 - (a) Activity descriptions shall be clear and concise. The beginning and end of each activity shall be readily verifiable.
 - (b) Responsibility for each activity shall be identified with a single performing organization. (i.e., Primes, suppliers, vendors and all sub-contractor)
 - (c) The cost component for each activity shall be provided, if requested by the Owner. The sum of the activity cost components shall equal the contract price.
 - (c) An activity must be no more than 14 calendar days in duration unless approved in advance by the Architect & Owner.
 - (e) Include relevant predecessors and successors for each activity as well as the type of relationships between, and any lag time required. All activities except the first activity (i.e., NTP) and last activity (i.e., Final Completion) shall have both predecessors and successors.
 - (f) Listing of Project submittals, approvals, and material/equipment site deliveries dates.
- 3. The identity of planned and reasonably anticipated inclement weather as identified in Article 4.3.7.2 of the General Conditions.
- 4. The identity of long lead items and delivery dates of all major pieces of equipment or materials.
- 5. The schedule must be resource loaded and identify the contractor performing the work and the number of workers needed to perform each activity.
- B. The General Contractor shall, within thirty (30) calendar days following Notice to Proceed, submit to the Architect & Owner, <u>a Computerized</u> <u>Construction Schedule</u> in precedence format for his construction/erection work scope.

- The Detailed Construction Schedule shall show:
- a. The order and interdependencies of the contractor's activities and the major points of interface or interrelation with the activities of others, including Specific Dates for completion.
- b. Conformance with and identification of the specified mandatory milestone dates specified in the Contract Documents.
- c. The description and quantity of work by activity.
- d. The time required for engineering, preparation and approval of shop drawings, manufacturing, and delivery of Contractor-furnished permanent plant materials.
- e. The time required for procurement, delivery, and erection of the Contractor's permanent plant materials.
- f. Delivery of Owner-furnished material and equipment.
- g. Shop fabrication and delivery.
- h. Critical Path (or Paths).

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- i. Erection and installation.
- j. Testing of equipment and materials.
- k. Activity calendars<u>.</u> Incorporating potential weather delays, or multi- work periods.
- C. The Detailed Construction Schedule shall indicate an early completion date for the project that is no later than the project's required completion date. All activity duration's shall be given in work days. The Schedule shall also indicate each of the following:
 - 1. Interfaces with the work of outside contractors, e.g., utilities, power, and with any separate contractor.
 - 2. Estimated duration time for each activity.
 - 3. Early start date for each activity.
 - 4. Late start date for each activity.
 - 5. Early finish date for each activity.
 - 6. Late finish date for each activity.
 - 7. Float available for each path of activities containing float.
 - 8. Actual start date for each activity begun.
 - 9. Actual finish date for each activity completed.
 - 10. Identification of all critical path activities in the schedule analysis.
 - 11. The critical path for the project, with said path of activities being clearly and easily recognizable on the time-scaled network diagram. The relationship between all non-critical activities and activities on the critical path shall be clearly shown on the network diagram.
 - 12. The dollar value of each activity in relation to the schedule of values, if required by the Owner.
 - 13. The responsibility code for the Contractor or Subcontractor performing each activity or portion thereof.
- D. The Architect & Owner will review the General Contractor's Detailed Construction Schedule, for compatibility with the Project Milestones and

Completion Schedule. If requested, a meeting will be held between the Architect & Owner and Contractor to resolve any conflicts in the Contractor's schedule. Contractor shall revise his schedule as required by the Architect & Owner ensure completion of the Project in accordance with the Project's Milestone and Completion Dates and shall submit his revised schedule to the Architect & Owner within five (5) calendar days.

- E. Within fourteen (14) calendar days following Notice to Proceed, the Contractor shall submit a Schedule of Values for review by the Architect & Owner. The Schedule of Values will allocate a dollar value (cost) for each activity. Each activity cost allocation shall include a labor, equipment and material cost and a pro rata contribution to overhead and profit. The sum of all activity costs shall be equal to the total Contract Sum. Each activity cost shall be coded with a cost code corresponding to the subcontractor responsible for performing the Work so that subtotals for each division of the Work can be prepared.
- F. Approval by the Architect & Owner of the General Contractor's Project Construction Schedule is advisory only and shall not relieve the Contractors of the responsibility for accomplishing the Work within each and every Contract-required Milestone and Completion date. Omissions and errors in the approved Project Construction Schedule shall not excuse performance which is not in compliance with the contract. Acceptance by the Architect & Owner in no way makes the Architect & Owner an insurer of the Project Construction Schedule's success or liable for time or cost overruns flowing from its shortcomings. The Owner hereby disclaims any obligation or liability by reason of Architect & Owner acceptance of or acquiescence to the Project Construction Schedule.
- G. The **General Contractor** shall compile, organize, and present a fully integrated Computerized Project Construction Schedule to the Architect & Owner within thirty (30) days of Notice to Proceed. The General Contractor shall provide five (5) hard copies of the Detailed Construction Schedule, the Schedule of Values and Computer Reports to the Architect & Owner and Prime Contractors for final review and acceptance. The General Contractor shall use the approved Project Construction Schedule in planning, organizing, directing, coordinating, performing and executing the work (including all activities of Subcontractors, equipment deliveries, vendors, and suppliers) and shall be the basis for evaluating the progress of the Work, subject to such revisions made in such schedule as provided for herein or in the Contract Documents.
- H. The **General Contractor** will develop and maintain the overall Project Construction Schedule, of which the Contractor's Detailed Construction Schedule will be a part. This schedule will be in precedence format and will be computer generated and updated and with the inclusion of the

approved prime contractor schedules will be the controlling schedule document utilized for managing overall project construction.

1-04 COMPUTER COST AND SCHEDULE REPORTS

- A. Every month the <u>General Contractor</u> will generate all monthly Prime contractors' progress documents (i.e., monthly Turn-a-round Documents and the progress payment application Cost/Schedule Reports) from the Detailed Construction Schedule, based on the Progress Reports received from the Contractors. These Reports will reflect the progress of the project in respect to both cost and time.
- B. Report Content:
 - 1. The initial and subsequent Schedule Reports shall include the following minimum information for each activity: activity number, by total float (from the least to the most), and late start date, in chronological order:
 - a. activity number
 - b. activity description
 - c. estimated duration in days
 - d. early and late start dates
 - e. early and late finish dates
 - f. percentage of activity completed as of each report
 - g. total float-positive/days behind schedule-negative
 - h. responsibility for activity

The General Contractor will produce monthly (4) four schedule reports. The reports are:

- 1. All activities on the Project Construction Schedule sorted by activity number.
- 2. Activity by Prime Contractor sorted. Further sorted by activity number.
- 3. All activities for prime contractors sorted by total float.
- 4. All activities by late start in chronological order.
- 2. The initial and subsequent Cost Reports shall include the following activity information sorted by trade:
 - a. activity number
 - b. activity description
 - c. current month percentage of value of work in place against Total Value
 - d. previous month percentage of value of work in place against Total Value
 - e. total cost of each activity

1-05 UPDATES

- A. Five (5) calendar days prior to the date of application for Progress Payment, each Prime Contractor's Project Manager and Superintendent, Architect & Owner shall meet at the job site for the purpose of reviewing the Contractor's report of actual progress, and obtaining from the Contractor (following his meeting with all concerned Subcontractors and suppliers) up-to-date and accurate progress data.
- B. Before the date of Application for Progress Payment, the General Contractor shall produce copies of all reports referred to in the contract documents.
- C. Each updated schedule must include the original base line schedule that was accepted by the Architect & Owner, and signed by each Prime Contractor. It also needs to reflect actual progress and anticipated completion durations.

1-06 PROGRESS PAYMENTS

- A. The submission and approval of progress updates and the reports calculating the value of work done for any given pay period for each activity based on the percentage complete for that activity less the amount previously paid for past percentages complete and percent of retainage shall be an integral part and basic element of the application upon which Progress Payments shall be made pursuant to the provisions of the General Conditions. The Contractor shall be entitled to progress payments only as determined from the current updated and approved Project Cost Report. Each month the updated and approved Project Cost Report shall be attached to AIA form G702 in submitting payment applications.
- B. Due to the fact that the Schedules and Reports System may not be fully operational before thirty (30) days after the Notice to Proceed, the Contractor may be due one Provisional Progress Payment for mobilization, overhead, procurement of bonds and insurance, and general conditions. However, no payment for work will be approved until the Contractor has complied with the provisions of this Section.
- C. The following outlines the Contractor's pay cycle process Payment cycle (Payment check issued on approximately the 15th on the following month):
 - 1. Current month construction progress status approved by Design Consultant by 20th of the month.
 - 2. Current month Payment Application approved by Design Consultant, and Owner by 25th of the month.

2-01 CONTRACTOR'S ORGANIZATION

The Contractor shall maintain, as part of its organization, <u>a staff/or</u> <u>consultant of sufficient knowledge</u> and whose responsibility will be to prepare input information for the Detailed Construction Schedule, monitor progress, provide input for updating and revise logic diagrams when necessary.

2-02 SPECIFIC DATES

The Contractor is required to adhere to the Specific Dates as set forth in the Contract Documents.

2-03 RECOVERY SCHEDULE

Pursuant to the General Conditions, should the General Contractor / Project Coordinator's approved Project Construction Schedule fall behind schedule to the extent that any of the mandatory specific or milestone dates or completion dates fall behind by 14 days or more, or in the opinion of the Architect & Owner are in jeopardy, the Contractor shall be required to, at no extra cost to the Owner, prepare and submit to the Owner and Design Consultant a supplementary Recovery Schedule, in a form and detail appropriate to the need, to explain and display how they intend to reschedule those activities to regain compliance with the Project Construction Schedule during the immediate subsequent pay period. This recovery schedule must indicate how the contractor / contractors intend to make up the delay in the project, either by additional shifts, additional work days (weekends & holidays), or by additional crews or crew sizes.

2-04 NETWORK REVISIONS

A. Should the Contractor, after approval of the initial Project Construction Schedule, desire to change his plan of construction, he shall submit his requested revisions to the Architect & Owner along with a written statement of the revisions including a description of the logic for rescheduling the work, methods of maintaining adherence to intermediate milestones and Specific Dates and the reasons for the revisions. The Contractor shall revise his schedule to include the effect of Changes, acts of God or other conditions or events which have affected the network. If the requested changes are acceptable to the other Prime Contractors, the Architect & Owner, and they do not adversely impact any Milestone or Completion Dates, they will be incorporated into a revised Approved Project Construction Schedule, to be compiled and produced by the General Contractor in the next reporting period. All costs associated with such revision shall be at the sole expense of the contractor.

- B. When the Owner orders changes by Change Order which have the potential to impact the Contract milestones or Specific Dates stipulated in the Contract Documents, a Revised Network will be prepared by the Contractor and provided to the Architect & Owner for concurrence or revision as he deems necessary. After the revised network has been mutually agreed upon, it will be incorporated into a revised Project Construction Schedule, to be compiled and produced by the General Contractor. Change Order logic will affect only those activities and performance dates directly concerned. Adjustments in Scheduled intermediate Completion Dates or for the Contract as a whole will be considered only to the extent that there is insufficient remaining float to absorb these changes.
- C. Any change to the approved Project Construction Schedule must be approved in writing by the Architect & Owner.
- D. Neither the updating or revision of approved Project Construction Schedule nor the submission, updating, change or revision of any report or schedule submitted to Architect & Owner by Contractor under this Section nor Owner's review or non-objection of any such report or schedule shall have the effect of amending or modifying, in any way, the Contract Time, any Contract Completion Date, or Contract Milestone Dates or of modifying or limiting in any way Contractor's obligations under this Contract.

2-05 FLOAT TIME

- A. Float or slack time is defined as the amount of time between the earliest start date and the latest start date or between the earliest finish date and the latest finish date of a chain of activities on the Detailed Construction Network. Contractor's work shall proceed according to early start dates, and the Architect & Owner shall have the right to reserve and apportion float time according to the needs of the project. The Contractor acknowledges and agrees that actual delays, affecting paths of activities containing float time, will not have any affect upon contract completion times, providing that the actual delay does not exceed the float time associated with those activities.
- B. Extensions of time for performance as described in the Contract Documents will be granted only to the extent that time adjustment for the activity or activities affected by any condition or event which entitles the Contractor to a time extension exceed the total float or slack along the path of activities affected at the time of Notice to Proceed of a Change Order or the commencement of any delay or condition for which an adjustment is warranted under the Contract Documents.

2-06 REQUESTED TIME ADJUSTMENT SCHEDULE:

- The updated approved Project Construction Schedule submitted by the Α. General Contractor shall not show a completion date later than the Contract Time, subject to any time extensions approved by Owner. If Contractor believes he is entitled to an extension of the Contract Time under the Contract Documents, Contractor shall submit to Owner and Design Consultant, a separate schedule analysis (entitled "Requested Time Adjustment Schedule") indicating suggested adjustments in the Contract Time which should, in the opinion of Contractor, be made in accordance with the contract Documents by time extension, due to changes, delays or conditions occurring during the past month or previously, or which are expected or contemplated by Contractor (whether such conditions are excusable under the Contract or are alleged to be due to Contractor or Owner fault); this separate schedule, if submitted, shall be time-scaled utilizing a computer generated and computer-drawn network analysis schedule, unless otherwise approved by the Architect & Owner and shall be accompanied or preceded by a formal time extension request as required by the Contract and a detailed narrative justifying the time extension requested.
- B. Neither the Architect & Owner shall have any obligation to consider any time extension request unless the requirements of all of the Contract Documents, are complied with the Owner shall not be responsible or liable to Contractor for any constructive acceleration due to failure of Owner to grant time extensions under the Contract Documents should Contractor fail to substantially comply with the submission requirements and the justification requirements of this Contract for time extension requests. Contractor's failure to perform in accordance with the approved Project Construction Schedule shall not be excused, nor be chargeable to Owner, because Contractor has submitted time extension requests or a "Requested Time Adjustment Schedule."

2-07 COORDINATION

- A. The Contractor shall coordinate his work with that of other contractors and shall cooperate fully with the Architect & Owner in maintaining orderly progress toward completion of the work as scheduled. The Architect & Owner decisions regarding priority between the Contractor's work and the work of other contractors at the site shall be final. If the Contractor's critical path work is delayed by the Architect & Owner decision, the Contractor shall submit any required time extension requests to the Owner in accordance with the Contract Documents.
- B. The milestone dates referred to in the Contract Documents for delivery of Owner-furnished equipment and materials and interface activities of other

contractors on the site are based on dates set forth in separate contracts with the Owner.

- C. Failure of Owner-furnished equipment and materials to arrive as scheduled, or failure of other construction contractors to meet their schedule, shall not be justification for an extension of time, except where such failure causes, in the opinion of the Architect & Owner a delay in the Contractor's critical path work, in which case the provisions of the General Conditions regarding extensions of time and extra work shall apply.
- D. The Contractor shall keep himself, and his subcontractors, advised at all times during the course of the Work regarding delivery status of Owner-furnished equipment and materials and of the progress of construction work being performed under separate contracts.
- E. The Architect & Owner will, upon written request by the Contractor, furnish delivery information which may be available to the Architect & Owner.

2-08 SCHEDULE OF OFF-SITE ACTIVITIES

- A. The Contractor shall include in his Detailed Construction Network all procurement related activities which lead to the delivery of materials to the site in a timely manner. Upon written approval by the Architect & Owner, these activities may be submitted as a separate Off-Site Activities Schedule, properly correlated to the Detailed Construction Schedule. The schedule of off-site activities shall include, but is not limited to, the following:
 - 1. Dates for submittals, ordering, manufacturing or fabricating, and delivery of equipment and materials. Long lead items requiring more than one month between ordering and delivery to site shall be clearly noted;
 - 2. All significant activities to be performed by the Contractor during the fabrication and erection/installation in a Contractor's plant or on a job site, including materials/equipment purchasing, delivery; and
 - 3. Contractor's drawings and submittals to be prepared and submitted to the Design Consultant.
- B. The Contractor shall be solely responsible for expediting the delivery of all material to be furnished by him so that the construction progress shall be maintained according to the approved Project Construction Schedule for the Work as approved by the Architect & Owner.
- C. The Architect & Owner shall be advised in writing by the Contractor whenever it is anticipated by the Contractor that the delivery date of any material and/or equipment furnished by the Contractor for installation will

be later than the delivery date shown on the schedule, subject to schedule updates.

- D. Submittals, equipment orders and similar items are to be treated as schedule activities, and shall be given appropriate activity numbers.
- E. The Contractor, in developing his off-site and procurement schedules, will ensure that off-site activities do not control the critical path of on-site activities.

2-09 CONTRACTOR COVENANTS AND GUARANTEES

- A. Contractor covenants and guarantees that Contractor will not:
 - 1. Misrepresent to Architect & Owner its planning scheduling or execution of the Work;
 - 2. Utilize schedules materially different from those made available by Contractor to the Architect & Owner or any Subcontractor or separate Contractors for the direction, execution and coordination of the Work, or which are not feasible or realistic.
 - 3. Prepare schedules, updates, revisions or reports for the work which do not accurately reflect the actual intent or reasonable and actual expectations of Contractor and its Subcontractor as to:
 - (a) The sequences of activities,
 - (b) The duration of activities,
 - (c) The responsibility of activities,
 - (d) Resources availability,
 - (e) Labor availability or efficiency,
 - (f) Foreseeable weather conditions,
 - (g) The value associated with the activity,
 - (h) The percentage complete of any activity,
 - (i) Completion of any item of work or activity,
 - (j) Project milestone completion,
 - (k) Delays, slippage's, or problems encountered or expected,
 - (I) Subcontractor requests for time extensions or delay claims of subcontractors, and
 - (m) Float time
- B. Contractor's failure to substantially comply with the foregoing covenant and guarantee shall be a substantial and material breach of contract which will permit Owner to terminate Contract for default, or withhold payments under the Contract Documents, and shall entitle Owner to the damages afforded for misrepresentation or fraud by these Contract documents or applicable law.
- C. Should Contractor fail to substantially comply with the provisions of the Contract documents relating to planning, scheduling and

execution of the Work by the overall project schedule, Owner and the Design Consultant shall have the right, at their option, after five (5) days notice, to retain the services of scheduling consultants or experts (including attorneys if necessary in their opinion) to prepare a schedule in accordance with the Contract Documents and to review and analyze same, in order to allow Architect & Owner to evaluate the program of the Work by Contractor, to determine whether Contractor is substantially complying with the Contract Documents, and to direct such action on the part of the contractor to ensure that Contractor will meet the Project's Construction Schedule and all Milestone and Completion Dates. All costs incurred by Owner in preparing the be charged to the schedule hereunder shall responsible If Contractor fails to substantially comply with the Contractor(s). scheduling and execution of the work requirements of the Contract Documents, Contractor hereby agrees to pay all costs for a 3rd party scheduling consultant (selected by the Owner) for the development and twice monthly updating of the construction schedule.

2-10 DEFAULT

Failure of the Contractor to substantially comply with the requirements of this Section shall constitute reason that the Contractor is failing to prosecute the Work with such diligence as will insure its completion within the Contract times and shall be considered grounds for termination by the Owner, pursuant to the General Conditions.

END OF SECTION

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SECTION 01 33 00 - SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 <u>SUMMARY</u>

- A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including;
 - 1. Contractor's construction schedule.
 - 2. Submittal schedule.
 - 3. Daily construction reports.
 - 4. Shop Drawings.
 - 5. Product Data.
 - 6. Samples.
- B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:
 - 1. Permits.
 - 2. Applications for payment.
 - 3. Performance and payment bonds.
 - 4. Insurance certificates.
 - 5. List of Subcontractors.
- C. The Schedule of Values submittal is included in Section "Applications for Payment."
- D. Inspection and test reports are included in Section "Quality Control Services."
- E. Submittal of Project photographs is included under Section "Construction Photographs."

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 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 elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

- a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- 3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
 - a. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 - b. If an intermediate submittal is necessary, process the same as the initial submittal.
 - c. Allow two weeks for reprocessing each submittal.
 - d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
- B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
 - 1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
 - 2. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number and title of appropriate Specification Section.
 - i. Drawing number and detail references, as appropriate.
- C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.
 - 1. On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
 - 2. Transmittal Form: Use AIA Document G 810.
 - 3. Transmittal Form: Use the sample form at the end of this Section for transmittal of submittals.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar- chart type Contractor's construction schedule. Submit within 30 days of the date established for "Commencement of the Work".
 - 1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".
 - 2. Within each time bar indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
 - 3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
 - 4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.
 - 5. Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.
 - 6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by requirements for phased completion to permit Work by separate Contractors and partial occupancy by the Owner prior to Substantial Completion.
- C. Work Stages: Indicate important stages of construction for each major portion of the Work, including testing and installation.
- D. Area Separations: Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.
- E. Cost Correlation: At the head of the schedule, provide a two item cost correlation line, indicating "precalculated" and "actual" costs. On the line show dollar-volume of Work performed as of the dates used for preparation of payment requests.
 - 1. Refer to Section "Applications for Payment" for cost reporting and payment procedures.

- F. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.
 - 1. When revisions are made, distribute 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 construction activities.
- G. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.5 <u>SUBMITTAL SCHEDULE</u>

- A. After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule.
 - 1. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.
 - 2. Prepare the schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:
 - a. Scheduled date for the first submittal.
 - b. Related Section number.
 - c. Submittal category.
 - d. Name of subcontractor.
 - e. Description of the part of the Work covered.
 - f. Scheduled date for resubmittal
 - g. Scheduled date the Architect's final release or approval.
- B. Distribution: Following response to initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
 - 1. When revisions are made, distribute 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 construction activities.
- C. Schedule Updating: Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.6 DAILY CONSTRUCTION REPORTS

- A. Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Architect at weekly intervals:
 - 1. List of subcontractors at the site.
 - 2. Approximate count of personnel at the site.

- 3. High and low temperatures, general weather conditions.
- 4. Accidents and unusual events.
- 5. Meetings and significant decisions.
- 6. Stoppages, delays, shortages, losses.
- 7. Meter readings and similar recordings.
- 8. Emergency procedures.
- 9. Orders and requests of governing authorities.
- 10. Change Orders received, implemented.
- 11. Services connected, disconnected.
- 12. Equipment or system tests and start-ups.
- 13. Partial Completions, occupancies.
- 14. Substantial Completions authorized.

1.7 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
- B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
 - Sheet Size: Except for templates, patterns and similar full- size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 36" x 48".
 - 7. Initial Submittal: Submit one correctable translucent reproducible print and one blue- or black-line print for the Architect's review; the reproducible print will be returned.
 - 8. Initial Submittal: Submit 2 blue- or black-line prints for the Architect's review; one will be returned.
 - 9. Final Submittal: Submit 3 blue- or black-line prints; submit 5 prints where required for maintenance manuals. 2 prints will be retained; the remainder will be returned.
 - 10. Final Submittal: Submit 3 blue- or black-line prints and 2 additional prints where required for maintenance manuals, plus the number of prints needed by the Architect for distribution. 2 prints will be retained; the remainder returned.
 - a. One of the prints returned shall be marked-up and maintained as a "Record Document".

- 11. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- C. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.
 - 1. Preparation of coordination Drawings is specified in section "Project Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.
 - 2. Submit coordination Drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1.8 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."
 - 1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
 - a. Manufacturer's printed recommendations.
 - b. Compliance with recognized trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
 - 2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.
 - 3. Preliminary Submittal: Submit a preliminary single-copy of Product Data where selection of options is required.
 - 4. Submittals: Submit 2 copies of each required submittal; submit 4 copies where required for maintenance manuals. The Architect will retain one, and will return the other marked with action taken and corrections or modifications required.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - 5. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
 - a. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.
 - b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.9 <u>SAMPLES</u>

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.
 - 1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect's Sample. Include the following:
 - a. Generic description of the Sample.
 - b. Sample source.
 - c. Product name or name of manufacturer.
 - d. Compliance with recognized standards.
 - e. Availability and delivery time.
 - 2. 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 the final submittal and the actual component as delivered and installed.
 - a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.
 - b. Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
 - c. Refer to other Sections for Samples to be returned to the Contractor for incorporation in the Work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample submittals.
 - 3. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.
 - a. Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.
 - 4. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.
 - 5. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.
- B. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work. Show distribution on transmittal forms.
- 1. Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.
 - a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.10 ARCHITECT'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.
 - 1. Compliance with specified characteristics is the Contractor's responsibility.
- B. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
 - 1. Final Unrestricted Release: Where submittals are marked "Approved," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
 - 2. Final-But-Restricted Release: When submittals are marked "Approved as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
 - 3. Returned for Resubmittal: When submittal is marked "Not Approved, Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
 - a. Do not permit submittals marked "Not Approved, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.
 - 4. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF TEXT SECTION (SEE SUBMITTAL TRANSMITTAL ATTACHED)

AIA[°] Document G810[™] – 2001

Transmittal Letter

PROJECT: (Name and address)

TO: (Name and address)

FROM: (Name and address)

WE TRANSMIT: VIA: FOR: THE FOLLOWING:	Attached Overnight Courier Approval Comment Drawings Submittals	delivery / Action	Under separate Mail Fax Information Distribution Specifications Other	e cover	 E-mail Other Use as requested Other Digital Files
NO. OF COPIES	DATE	FORMAT		DESCRIPTION	

REMARKS:

BY:

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SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 <u>SCOPE</u>

- A. Description Of Requirements: Required inspection and testing services are intended to assist in the determination of probable compliance of the work with requirements specified or indicated. These required services do not relieve the Contractor of responsibility for compliance with these requirements or for compliance with requirements of the contract documents. See Section 01 41 50 - Special Inspections and Structural Testing, and Section 01 41 60 - Quality Assurance Plan for Seismic Requirements for additional requirements regarding inspections and testings.
 - 1. Definitions: The requirements of this section relate primarily to customized fabrication and installation procedures, not to the production of standard products. Quality control services include inspections and tests and related actions including reports, performed by independent agencies and governing authorities, as well as directly by the Contractor. These services do not include observation activities performed directly by the Architect or Engineer.

Specific quality control requirements for individual units of work are specified in the sections of these specifications that specify the individual element of the work. These requirements, including inspections and tests, cover both production of standard products, and fabrication of customized work. These requirements also cover quality control of the installation procedures.

Inspections, tests and related actions specified in this section and elsewhere in the contract documents are not intended to limit the Contractor's own quality control procedures which facilitate overall compliance with requirements of the contract documents.

Requirements for the Contractor to provide quality control services as required by the Architect/Engineer, the Owner, governing authorities or other authorized entities are not limited by the provisions of this section.

1.2 <u>RESPONSIBILITIES</u>

- A. Contractor Responsibilities: It shall be the Owner's responsibility to engage and pay for testing and inspections and similar quality control services.
 - Contractor shall be responsible for proper notification when an inspection or test is required, to provide access to facilitate the inspection / test and shall be responsible to make corrections necessary when work is not in compliance with the Contract Documents. These responsibilities shall apply regardless of which party pays for the inspection / test.

- B. Owner's Responsibilities:
 - 1. The Owner will engage and pay for the services of an independent agency to perform all inspections and tests unless specifically specified as the Contractor's responsibility or to be provided by another identified entity (i.e., the manufacturer).
 - 2. Inspections: All special inspections as listed in Section 01 41 50 Special Inspections and Structural Testing shall be the Owner's responsibility to procure and pay for required inspections and testing.
- C. Retest Responsibility: Where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance of related work with the requirements of the contract documents, then **retests are the responsibility of the Contractor**, regardless of whether the original test was the Contractor's responsibility. Retesting of work revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original work. Same agency that performed original tests shall perform re-tests. Re-inspection and re-testing fees shall be withheld from the contractor's payment application. There shall be no money going from the contractor to the inspection/testing firm.
- D. Responsibility for Associated Services: The Contractor is required to cooperate with the independent agencies performing required inspections, tests and similar services. Provide such auxiliary services as are reasonably requested. Notify the testing agency sufficiently in advance of operations to permit assignment of personnel. These auxiliary services include, but are not necessarily limited to, the following:

Providing access to the work. Taking samples or assistance with taking samples. Delivery of samples to test laboratories. Security and protection of samples and test equipment at the project site.

- E. Coordination: The Contractor and each independent agency engaged to perform inspections, tests and similar services for the project shall coordinate the sequence of their activities so as to accommodate required services with a minimum of delay in the progress of the work. In addition the Contractor and each independent testing agency shall coordinate their work so as to avoid the necessity of removing and replacing work to accommodate inspections, tests, taking of samples and similar activities.
- F. Qualification for Service Agencies: Except as otherwise indicated, engage inspection and test service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which are recognized in the industry as specialized in the types of inspections and tests to be performed. Testing agency shall be approved by the Architect and the Building Official.

1.3 SUBMITTALS

A. General: Refer to Division - 1 section on "Submittals" for the general

requirements on submittals. See Sections 01 41 50 and 01 41 60 for specific reporting requirements for Special Inspections. Submit a certified written report of each inspection, test or similar service, to the Architect, Owner, Building Official, and Contractor.

- 1. Inspection / testing firm shall be responsible to notify the Contractor and Architect immediately of all failed tests in writing. If deficiency is not corrected, the inspection / testing firm shall notify the Owner and Building Official.
- 2. Report Data: Written reports of such inspection, test or similar service shall include, but not be limited to the following:

Name of Project. Name of testing agency or test laboratory. Dates and locations of samples and tests or inspections. Names of individuals making the inspection or test. Designation of the work and test method. Complete inspection or test data. Test results. Interpretations of test results. Notation of significant ambient conditions at the time of sample-taking and testing. Comments or professional opinion as to whether inspected or tested work complies with requirements of the contract documents.

Recommendations on corrections necessary, if applicable.

Recommendation on retesting, if applicable.

- 3. A copy of each report shall be kept in the job trailer.
- B. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 TESTING AND INSPECTION

- A. See individual specification sections and Sections 01 41 50 and 01 41 60 for testing and inspection required.
- B. Testing Agency Duties:
 - 1. Test samples of mixes submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify Architect and Contractor of observed irregularities or nonconformance of Work or products.

- 6. Perform additional tests and inspections required by Architect.
- 7. Attend preconstruction meetings and progress meetings.
- 8. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.

3.2 MANUFACTURERS' FIELD SERVICES:

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, and test, adjust and balance equipment, as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect 30 days in advance of required observations.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.3 **REPAIR AND PROTECTION:**

A. General: Upon completion of inspection, testing, sample-taking and similar services performed on the work, Contractor shall repair damaged work and restore substrates and finishes to eliminate deficiencies, including deficiencies in the visual qualities of exposed finishes. Comply with the contract document requirements for "Cutting and Patching". Protect work exposed by or for quality control service activities, and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION

SECTION 01 41 00 - REGULATORY REQUIREMENTS

- A. The following requirements of Regulatory Agencies having an interest in this project are hereby made a part of this Contract.
- B. The construction of the project, including the letting of contracts in connection therewith, shall conform to the applicable requirements of State, territorial, and local laws and ordinances to the extent that such requirements do not conflict with Federal laws and this subchapter.
- C. South Carolina Sales Tax: All applicable South Carolina sales tax shall be to the account of the Contractor.
- D. Use of chemicals: All chemicals used during the project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, must show approval of EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.
- E. Safety and Health Regulations: The Contractor shall comply with the Department of Labor and Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL-91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL91-54).
- F. Inspection by Agencies: The representatives of the South Carolina Department of Health and Environmental Control, Richland County and South Carolina Department of Highways and Public Transportation, and, where applicable, municipalities in which a project is located, shall have access to the work wherever it is, in preparation or in progress, and the Contractor shall provide proper facilities for such access and inspection.
- G. Withholding for Non-Residents shall comply with the following:
 - 1. Attention of non-resident contractors is invited to Part Two, Act No. 855, Acts of the General Assembly of South Carolina 1958.
 - 2. If a non-resident contractor is the successful bidder on this project, he shall be required to post surety bond, or deposit cash or securities with the South Carolina Tax Commission in compliance with the Act. Proof of such coverage shall be filed with the Engineer before work is started.
 - 3. If the Contractor fails to comply with the regulations of the South Carolina Tax Commission, two percent (2%) of each and every payment made to the Contractor shall be retained by the Owner to satisfy such requirements.

END OF SECTION.

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SECTION 01 41 26 - PERMITS AND RIGHTS-OF-WAY

PART ONE - GENERAL

1-01 **DESCRIPTION**

- A. Work included: This section establishes requirements pertaining to the securement and payment for licenses, building permits, rights-of-way, etc. necessary for the construction of the project.
- B. Work not included: The Owner will obtain and provide to the Contractor, as required, copies of:
 - 1. Encroachment permits, State Highway Department.
 - 2. Encroachment permits, Public Utility.
 - 3. Easements obtained to cross private property.
 - 4. S.C. Department of Health and Environmental Control Permit to Construct.
- C. Related Work:
 - 1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these specifications.

1-02 SUBMITTALS

A. Submit to the Architect satisfactory evidence that all necessary licenses, building permits, etc. have been secured prior to commencing the work.

PART TWO – PRODUCTS No products are required for this work.

PART THREE - EXECUTION

3-01 BUSINESS LICENSE

- A. Determine licenses necessary to perform the work at project location.
- B. Obtain all necessary licenses at no additional cost to the Owner.

3-02 BUILDING PERMITS

A. The agency will secure the building permit from OSE.

END OF SECTION

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SECTION 01 41 50 - SPECIAL INSPECTIONS AND STRUCTURAL TESTING

PART 1 - GENERAL

1.1 <u>SCOPE</u>

- A. This section includes a listing of special inspections as required by Chapter 17 of the 2018 International Building Code (IBC) to be performed during the progress of this project. 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 and the 2012 International Building Code.
- B. Related Work:

Section 01 40 00Quality RequirementsSection 01 41 60Quality Assurance Plan for Seismic Requirements

1.2 <u>RESPONSIBILITY</u>

A. It shall be the Owner's responsibility to contract and pay for special inspections; however, the Contractor shall be responsible for proper notification when inspection is required in the progress of the work, providing access to facilitate the inspection and making corrections necessary when work is not in compliance with the Contract Documents. The Contractor shall give the Inspector a 2 business day notice minimum when an inspection for a portion of the work is required.

1.3 <u>REPORTS</u>

A. Copies of inspection reports signed by person performing the inspection or test shall be submitted to Owner, Architect, and Contractor. A copy shall also be kept in the job trailer.

Reports shall be written using Office of State Engineer forms SE-965 and SE 966

1.4 GENERAL REQUIREMENTS

- A. Special Inspections and Materials Testing shall be in accordance with Chapter 17 of the 2012 International Building Code.
- B. Special Inspections and Materials Testing shall be in accordance with the Council of American Structural Engineers (CASE).

- C. The program of Special Inspections and Structural Testing is a Quality Assurance Program intended to ensure that the work is performed in accordance with the Contract Documents.
- D. This specification section is intended to inform the Contractor of the Owner's quality assurance program and the extent of the Contractor's responsibilities. This specification section is also intended to notify the Special Inspector, Testing Laboratory, and other Agents of the Special Inspector of their requirements and responsibilities.

1.5 SPECIAL INSPECTIONS

- A. Shall be performed by a qualified inspector and/or approved testing agency, acceptable to the Building Official.
- B. Contractor shall be responsible to notify inspector in a timely manner (2 business day prior notice minimum) when required inspections need to be performed.
- C. The inspection / testing firm shall be responsible to notify the Contractor and Architect immediately of all failed inspections and/or tests in writing. If discrepancies are not corrected, the Special Inspector shall notify the Building Official and the Owner.

1.6 SCHEDULE OF INSPECTIONS AND TESTS

A. Required inspections and tests are described in the "Statement of Special Inspections" attached at the end of this section, and in the individual specification Sections for the items to be inspected or tested.

1.7 SEISMIC QUALITY ASSURANCE PLAN

- A. See Section 01 41 60 for Quality Assurance Plan.
- B. A Seismic Quality Assurance Plan is mandated by the Building Code for the following systems and components:
 - 1. Seismic-force-resisting systems.
 - 2. HVAC ductwork containing hazardous materials, and anchorage of such ductwork.
 - 3. Piping systems and mechanical units containing flammable, combustible or highly toxic materials.
 - 4. Anchorage of electrical equipment used for emergency or standby power systems.
 - 5. Suspended ceilings and their anchorage.

1.8 QUALIFICATIONS

- A. The Testing Laboratory and individual technicians shall be approved by the Structural Engineer of Record (SER) and the Building Official.
- B. The Testing Laboratory shall maintain a full time licensed Professional Engineer (P.E.) on staff who shall certify the test reports. The Engineer shall be responsible for the training of the testing technicians and shall be in responsible charge of the filed and laboratory testing operations.
- C. Special Inspections shall be performed by inspectors as approved by the Building Official.
 - 1. Special Inspectors shall possess current certifications in the trade areas which are to be inspected.

1.9 <u>SUBMITTALS</u>

- A. The Special Inspector and Testing Laboratory shall submit to the SER and the Building Official for review a copy of their qualifications which shall include the names and qualifications of each of the individual inspectors and technicians who will be performing inspections or tests.
- B. The Special Inspector and Testing Laboratory shall disclose any past or present business relationship or potential conflict of interest with the Contractor or any of the Subcontractors whose work will be inspected or tested.

1.10 <u>PAYMENT</u>

A. The Owner shall engage and pay for the services of the Special Inspector, Agents of the Special Inspector, and the Testing Laboratory.

1.11 CONTRACTOR RESPONSIBILITIES

- A. Contractor's Statement of Responsibility: Each Contractor responsible for the construction of a seismic-force-resisting system, designated seismic system, or component listed in the Seismic Quality Assurance Plan shall submit a "Contractor's Statement of Responsibility", included in Section 01 41 60, to the Building Official and the Architect prior to the commencement of work. The Contractor's statement of responsibility contains the following:
 - 1. Acknowledgement of awareness of the project's special inspection requirements.
 - 2. Acknowledgement that control will be exercised to obtain conformance with the construction documents approved by the Building Official.
 - 3. Procedures for exercising control within the contractor's organization, the method and frequency of reporting, and the distribution of the reports

- 4. Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.
- B. The Contractor shall cooperate with the Special Inspector and his agents so that the Special Inspections and testing may be performed without hindrance.
- C. The Contractor shall review the "Statement of Special Inspections" and shall be responsible for coordinating and scheduling inspections and tests. The Contractor shall notify the Special Inspector or Testing Laboratory at least 2 business days in advance of a required inspection or test. Un-inspected work that required inspection may be rejected solely on that basis.
- D. The Contractor shall provide incidental labor and facilities to provide access to the work to be inspected or tested, to obtain and handle samples at the site or at the source of products to be tested, and to facilitate tests and inspection, storage and curing of test samples.
- E. The Contractor shall keep at the project site the latest set of construction drawings, field sketches, approved and field use shop and erection drawings, and specifications for use by the inspectors and testing technicians.
- F. The Special Inspection program shall in no way relieve the Contractor of his obligation to perform work in accordance with the requirements of the Contract Documents or from implementing an effective Quality Control program. All work that is to be subjected to Special Inspections shall first be reviewed by the Contractor's quality control personnel.
- G. The Contractor shall be solely responsible for construction site safety.

1.12 LIMITS ON AUTHORITY

- A. The Special Inspector or Testing Laboratory may not release, revoke, alter, or enlarge on the requirements of the Contract Documents.
- B. The Special Inspector or Testing Laboratory will not have control over the Contractor's means and methods of construction.
- C. The Special Inspector or Testing Laboratory shall not be responsible for construction site safety.
- D. The Special Inspector or Testing Laboratory has no authority to stop the work except with prior written consent of the Owner.

1.13 <u>RECORDS AND REPORTS</u>

A. Detailed daily reports shall be prepared of each inspection and test and submitted to the Special Inspector. Reports shall include:

- 1. Name of Project
- 2. Date of test or inspection
- 3. Name of inspector or technician
- 4. Location of specific areas tested or inspected
- 5. Description of test or inspection and results and interpretation of results
- 6. Applicable ASTM standard or test method
- 7. Weather conditions
- 8. Engineer's seal and signature
- 9. Corrective actions, if any
- 10. Recommendation for re-inspection (if applicable)
- B. The Special Inspector shall submit interim reports at the end of each week which includes all inspections and test reports received that week. Copies shall be sent to the Architect, Contractor, and SER and a copy shall be kept on site.
- C. Any discrepancies from the Contract Documents found during a Special Inspection shall be immediately reported to the Contractor and Architect. If the discrepancies are not corrected, the Special Inspector shall notify the Owner and the Building Official. Reports shall document all discrepancies identified and the corrective action taken.
- D. The Testing Laboratory shall immediately notify the Special Inspector, Contractor, and Architect by telephone, fax or email of any test results which fail to comply with the requirements of the Contract Documents. If conditions are not corrected, the testing laboratory shall notify the Owner and the Building Official.
- E. Reports shall be submitted to the Special Inspector within 7 days of the inspection or test. Hand written reports may be submitted if final typed copies are not available. See Inspection Report Form in Section 01 40 00 Quality Requirements.
- F. At the completion of the work requiring Special Inspections, each inspection agency and testing laboratory shall provide a statement to the Owner, Architect and the Building Official that all work was completed in substantial conformance with the Contract Documents and that all appropriate inspections and tests were performed.

1.14 FINAL REPORT OF SPECIAL INSPECTIONS

- A. The "Final Report of Special Inspections" shall be completed by the Special Inspector and submitted to the Owner, Architect and the Building Official prior to the issuance of a Certificate of Use and Occupancy.
- B. The "Final Report of Special Inspections" will certify that all required inspections have been performed and will itemize any discrepancies that were not corrected or resolved.

1.14 SCHEDULE OF SPECIAL INSPECTION AGENTS

Project Name: Hewn Timber Cabins Refurbishment

Engineers's Commission Number: OSE Project # H18-N083-SG

The construction divisions which require special inspections for this project are listed below. The following firms / individuals are designated to perform Special Inspections of the material or work for each construction division and shall be employed by the Owner.

CONSTRUCTION DIVISION	INSPECTION AGENT / FIRM	ADDRESS / TELEPHONE
Soils and Foundations	To be determined	
Piles and/or Piers		
Cast-in-Place Concrete		
Precast Concrete		
Masonry		
Structural Steel		
⊠ Cold-Formed Steel Framing		
Spray Fire Resistant Material		
Wood Construction		
Exterior Insulation and Finish System		
Mechanical & Electrical Systems		
Architectural Systems		
□ _{Special Cases}		
Smoke Control System		
□ Metal Building Fabrication		
Pre-Fabricated Trusses		
Wall Panels & Veneers		

1.15 SCHEDULE OF SPECIAL INSPECTIONS

Project Name: Hewn Timber Cabins Refurbishment Engineer's Commission Number: <u>OSE Project# H18-N083-SG</u>

Page <u>1</u> of <u>3</u>

Instructions

The Structural Engineer of Record shall determine the material and/or work on the project requiring Special Inspections. The Special Inspection requirements shall be based on Chapter 17 of the 2012 International Building Code. Any deviations from the requirements of Chapter 17 must be approved by the Building Official. If Inspection is by "Other", the inspecting entity shall be identified by the Owner to the Contractor prior to the execution of the Contract.

MATERIALS	TYPE OF INSPECTION	SPECIFICATION REFERENCE	INSPECTION BY:		
			Architect	Engineer	Other
Soils	Subgrade Preparation per Soils Report				X
	Fill Placement Materials				X
	Fill Lift Thickness				X
	In-Place Fill Density				X
	Footing Bottoms				X
	Stormwater Inspections (Periodic) 14 days max. and after storm event 0.5" or more				X
	Sitework activity as required by DHEC (Periodic – Monthly)				X
Concrete	Material Certification	03-3000			X
	Rebar Placement (Periodic)	03-3000			X
	Reinforcing Steel Welding (Cont)				N/A
	Verify use of Design Mix (Periodic)	03-3000			X
	Formwork	03-3000			X
	Sample Slump, air, temperature (Cont)	03-3000			Х
	Concrete Placement (Cont)	03-3000			X
	Curing (Periodic)	03-3000			X
	Verification of In-Situ Strength (Periodic)	03-3000			X
Masonry	Periodic Verification:				
	a) Material certification (daily)				
	b) Site mixed mortar				X

* Following form to be completed at completion of Construction Documents.

MATERIALS	TYPE OF INSPECTION	SPECIFICATION REFERENCE	INSPECTION BY:		
			Architect	Engineer	Other
Masonry (con't)	c) Mortar joint placement				Х
	d) Mortar joint construction				Х
	e) Rebar location (daily)				N/A
	f) Rebar placement (daily)				N/A
	g) Clean grout space				X
	h) Site mixed grout				Х
	Periodic Inspection:				X
	a) Size & location of structural elements (weekly)				N/A
	b) Type & location of anchors				Х
	c) Size & type of reinforcing				X
	d) Cold / hot weather protection				Х
	Welding of rebar (Continuous)				N/A
	Verification of grout placement (Continuous)				N/A
	Preparation of grout & mortar specimens (Cont)				N/A
	Compliance with inspections and submittals (Periodic)				X
Structural Steel	Fabricator Certification / QC Procedures	05-1200			X
	Verification of high-strength bolts / washers (Periodic)				X
	Inspection of high-strength bolting (Periodic)				X
	Verification of structural steel materials	05-1200			X
	Verification of weld filler materials	05-1200			X
	Inspection of steel frame joints (periodic)	05-1200			X
	Bracing, stiffening, member locations & connections – inspection @ completion	05-1200			X
	Inspection of Structural Steel Welding:				X
	a) Welder's certifications & procedures	05-1200			X
	b) Penetration groove (Continuous)	05-1200			X
	c) Single-pass < 5/16" (Periodic)	05-1200			X
	d) Visually inspect all completed welds	05-1200			X

MATERIALS	TYPE OF INSPECTION	SPECIFICATION REFERENCE	INSPECTION BY:		
			Architect	Engineer	Other
Steel Frame Joints	Periodic Inspection of Steel Frame				N/A
Steel Joists	Inspection of field welds and bolts (Periodic)				N/A
Steel Deck	Inspection of roof deck fastening (Periodic)				N/A
Prefabricated Metal Building	Fabrication and implementation procedures or certificate of compliance				N/A
Cold-Formed Steel Framing	Verfiy stud, track, bracing, jamb, and header sizes (Periodic)	05-4000			X
	Verification of members and fastening (Periodic)	05-4000			X
	Bracing and anchorage (Periodic)	05-4000			Х
Timber Trusses	Fabrication and QC Procedures	06-1753			X
	Verification of members and fastening (Periodic)	06-1753			Х
	Bracing and anchorage to walls	06-1753			X
Mechanical Components	Manufacturer certification required on mechanical equipment			X	
	Inspection of label & anchorage of mechanical equipment (upon completion)				X
	Seismic isolators, review of submittal			X	
	Seismic isolators field inspection of installation (upon completion)				X
	Fire Sprinkler systems installation (Periodic)				X
	Manufacturer certification required on fire sprinkler system			X	
	Inspection of label and anchorage of fire sprinkler equipment				X
Electrical Components	Cable tray support system manufacturer's testing				X
	Grounding system - field inspection (Periodic)				X
	Seismic anchorage of emergency generator (Periodic)				X

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SECTION 01 41 60 - QUALITY ASSURANCE PLAN FOR SEISMIC REQUIREMENTS

PART 1 - GENERAL

- 1) Seismic Force Resisting Systems
 - a) Concrete
 - b) Light gage shear walls
 - c) Timber trusses and sheathing
 - d) Structural steel
- 2) Special inspections for the seismic resisting force systems in item 1 above are specified in Section 01 41 50 in "Special Inspections and Structural Testing".
- 3) Testing:
 - a) Additional testing of concrete (not part of quality assurance plan) is specified in specification section 03 30 00.
- 4) The type and frequency of special inspections required are specified in Section 01 41 50 in "Special Inspections and Structural Testing."
- 5) The Special Inspector will keep records of all inspections for seismic requirements and furnish inspection reports to the Building Official, the Owner, Contractor, Structural Engineer, and Architect of Record. Discovered discrepancies will be brought to the immediate attention of the Contractor and A/E. If discrepancies are not corrected, the Special Inspector shall notify the Owner and the Building Official.
- 6) Testing and special inspection reports prepared by the Special Inspector shall be distributed weekly to the Architect, Contractor, Owner, Structural Engineer, and the Building Official.
- 7) A Final Report of Special Inspections shall be prepared by the Special Inspector documenting completion of all required Special Inspections and correction of any discrepancies noted in the inspections and shall be submitted prior to issuance of a Certificate of Use and Occupancy.
- 8) A representative from Mabry Engineering Associates, Inc. will perform appropriate structural observations of the structural systems for general conformance with construction documents at significant stages of construction and at completion of the project.
- 9) A report of each structural observation will be prepared and distributed to the Architect for distribution to Contractor and Owner.

- 10) Additional Systems in Structures
 - a. Exterior wall panels and their anchorages.
 - b. Seismic bracing for fire sprinkler system
 - c. Mechanical components
 - d. Electrical components
- 11) Special inspections for additional systems in structure listed in Item 1 above are specified in "Special Inspections and Structural Testing" in Section 01 41 50.
- 12) Testing:

a) Submit certificates of compliance as required in Submittal paragraphs as listed in specification reference column of "Special Inspections and Structural Testing" in Section 01 41 50.

- 13) Type and frequency of special inspections for additional systems are specified in "Special Inspections and Structural Testing" in Section 01 41 50.
- 14) The Special Inspector will keep records of all inspections for seismic requirements and furnish inspection reports to the Building Official, the Owner, Contractor, Engineer, and Architect of Record. Discovered discrepancies will be brought to the immediate attention of all parties.
- 15) Testing and special inspection reports shall be distributed weekly to the Architect, Contractor, Owner, Engineer, and the Building Official.
- 16) A *Final Report of Special Inspections* documenting completion of all required Special Inspections and correction of any discrepancies noted in the inspections will be submitted prior to issuance of a Certificate of Use and Occupancy.
- 17) A representative from FW Architects, Inc. will perform appropriate observations of progress for general conformance with construction documents.
- 18) A representative from Owens and Associates, Inc. will perform mechanical observations of the mechanical, plumbing and fire protection systems for general conformance with construction documents at significant construction stages and at completion of the project.
- 19) A representative from Owens and Associates, Inc. will perform electrical observations of the electrical system for general conformance with construction documents at significant construction stages and at completion of the project.
- 20) A representative from Ervin Engineering will perform monthly site observations when site work activity is in progress for general conformance with the construction documents and stormwater requirements as required by SCDHEC.

21) A report of each sitework, architectural, mechanical and electrical observation will be prepared and distributed to the Architect, Contractor and Owner.

END OF SECTION

(Contractor's Statement of Responsibility, following this page)

Contractor's Statement of Responsibility - Seismic Quality Assurance

To be completed by the General Contractor and every Subcontractor responsible for the construction of a designated systems and components listed in the Seismic Quality Assurance Plan. Submit separate copies to the Building Official and to the Owner.

Project: Hewn Timber Cabins Refurbishment Florence, South Carolina

Owner: Francis Marion University

A Seismic Quality Assurance Plan as required by the 2012 International Building Code has been defined for this project. The required Seismic Quality Assurance program entitled "Quality Assurance for Seismic Resistance" is contained within Section 01 41 60 – "Quality Assurance Plan for Seismic Requirements" of the Project Manual. The program designates building elements covered and references requiring Special Inspections that are part of the Seismic Quality Assurance Plan.

As a Contractor responsible for the construction of designated systems and components listed in the quality assurance plan, I acknowledge the following:

- 1. We acknowledge awareness of the special requirements contained in the quality assurance plan.
- 2. We acknowledge that control will be exercised to obtain conformance with the construction documents approved by the Building Official.
- 3. Procedures will be maintained for exercising control within our organization to ensure compliance for the method and frequency of reporting, and for the distribution of the reports. (Attach description of procedures to be instituted.)
- 4. Person(s) in our organization exercising control of the quality assurance plan requirements and their qualifications are identified in the attachment provided. (Attach list of personnel with qualifications.)

Submitted by:

(Type or Print Name of Firm)

(Type or Print Name of Firm Owner, Partner or Corp. Sec.)

Signature	Date	Cor	porate Seal
Owner's Authorization:		Building Official's Acceptance:	
Signature	Date	Signature	Date

SECTION 01 42 19 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 <u>RELATED DOCUMENTS</u>

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 <u>DEFINITIONS</u>

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. Indicated: The term indicated refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as shown, noted, scheduled, and specified are used to help the reader locate the reference. Location is not limited.
- C. Directed: Terms such as directed, requested, authorized, selected, approved, required, and permitted mean directed by the Architect, requested by the Architect, and similar phrases.
- D. Approved: The term approved, when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.
- E. Regulations: The term regulations includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. Furnish: The term furnish means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. Install: The term install describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

- H. Provide: The term provide means to furnish and install, complete and ready for the intended use.
- I. Installer: An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 - 1. The term experienced, when used with the term Installer, means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.
 - 2. Trades: Using terms 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 tradespersons of the corresponding generic name.
 - 3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.
 - a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.
- J. Project Site is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- K. Testing Agencies: A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16-Division format and MASTERFORMAT numbering system.
- B. Specification Content: This Specification uses certain conventions regarding the

style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

- 1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
- 2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
 - a. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

- A. Applicability of Standards: Except where 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 the standards in effect as of the date of the Contract Documents.
- C. Conflicting Requirements: Where compliance with 2 or more standards is specified and where the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different but apparently equal and uncertainties to the Architect for a decision before proceeding.
 - 1. 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 the requirements. Refer uncertainties to the Architect for a decision before proceeding.
- D. Copies of Standards: Each entity engaged in construction on the Project is required to 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, the Contractor shall obtain copies directly from the publication source.
- E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.
- F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed, but not assured, to be accurate and up-to-date as of date of the Contract Documents.

AA Aluminum Association 900 19th St., NW, Suite 300 Washington, DC 20006	(202) 862-5100
AABC Associated Air Balance Council 1518 K St., NW Washington, DC 20005	(202) 737-0202
AAMA American Architectural Manufacturers Assoc. 1540 E. Dundee Road, Suite 310 Palatine, IL 60067	(708) 202-1350
AAN American Association of Nurserymen 1250 Eye St., NW, Suite 500 Washington, DC 20005	(202) 789-2900
AASHTO American Association of State Highway and Transportation Offic 444 North Capitol St., Suite 249 Washington, DC 20001	ials (202) 624-5800
AATCC American Association of Textile Chemists and Colorists P.O. Box 12215 Research Triangle Park, NC 27709-2215	
ACI American Concrete Institute P.O. Box 19150 Detroit, MI 48219	(919) 549-8141 (313) 532-2600

ACIL American Council of Independent Laboratories 1629 K St., NW Washington, DC 20006	(202) 887-5872
ACPA American Concrete Pipe Assoc. 8300 Boone Blvd., Suite 400 Vienna, VA 22182	(703) 821-1990
ADC Air Diffusion Council One Illinois Center, Suite 200 111 East Wacker Dr. Chicago, IL 60601-4298	(312) 616-0800
AFBMA Anti-Friction Bearing Manufacturers Assoc. 1101 Connecticut Ave., NW, Suite 700 Washington, DC 20036	(202) 429-5155
AFPA American Forest and Paper Assoc. (American Wood Council of the 1111 19th St., NW, Suite 800 Washington, DC 20036) (202) 463-2700
AGA American Gas Assoc. 1515 Wilson Blvd. Arlington, VA 22209	(703) 841-8400
AHA American Hardboard Assoc. 1210 W. Northwest Highway Palatine, IL 60067	(708) 934-8800
AHAM Association of Home Appliance Manufacturers 20 N. Wacker Dr., Suite 1500 Chicago, IL 60606	(312) 984-5800
Al Asphalt Institute Research Park Dr. P.O. Box 14052 Lexington, KY 40512-4052	(606) 288-4960
AIA The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006	(202) 626-7300
A.I.A. American Insurance Assoc. 1130 Connecticut Ave., NW, Suite 1000 Washington, DC 20036	(202) 828-7100

(216) 873-2442
(312) 670-2400
(202) 452-7100
(206) 254-9132
(708) 358-7400
(301) 972-1700
(708) 394-0150
(212) 642-4900
(703) 522-3032
(402) 472-8649
(206) 565-6600

API American Petroleum Institute 1220 L St., NW Washington, DC 20005	(202) 682-8000
ARI Air-Conditioning and Refrigeration Institute 4301 Fairfax Dr. Arlington, VA 22203	(703) 524-8800
ARMA Asphalt Roofing Manufacturers Assoc. 6000 Executive Dr., Suite 301 Rockville, MD 20852-3803	(301) 231-9050
ASA Acoustical Society of America 500 Sunnyside Blvd. Woodbury, NY 11797	(516) 349-7800
ASC Adhesive and Sealant Council 1627 K St., NW, Suite 1000 Washington, DC 20006-1707	(202) 452-1500
ASHRAE American Society of Heating, Refrigerating and Air-Conditioning 1791 Tullie Circle, NE Atlanta, GA 30329	Engineers (404) 636-8400
ASME American Society of Mechanical Engineers 345 East 47th St. New York, NY 10017	(212) 705-7722
ASPA American Sod Producers Assoc. 1855-A Hicks Rd. Rolling Meadows, IL 60008	(708) 705-9898
ASPE American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362	(805) 495-7120
ASSE American Society of Sanitary Engineering P.O. Box 40362 Bay Village, OH 44140	(216) 835-3040
ASTM American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103-1187	(215) 299-5400

AWCMA American Window Covering Manufacturers Assoc. 355 Lexington Ave., 17th Floor New York, NY 10017	(212) 661-4261
AWI Architectural Woodwork Institute P.O. Box 1550 13924 Braddock Rd., Suite 100 Centerville, VA 22020	(703) 222-1100
AWPA American Wood Preservers' Assoc. P.O. Box 286 Woodstock, MD 21163-0286	(410) 465-3169
AWPBAmerican Wood Preservers' Bureau (This organization is now de	funct.)
AWS American Welding Society 550 LeJeune Road, NW P.O. Box 351040 Miami, FL 33135	(305) 443-9353
AWWA American Water Works Assoc. 6666 W. Quincy Ave. Denver, CO 80235	(303) 794-7711
BANC Brick Association of North Carolina P.O. Box 13290 Greensboro, NC 27415-3290	(919) 273-5566
BHMA Builders' Hardware Manufacturers Assoc. 355 Lexington Ave., 17th Floor New York, NY 10017	(212) 661-4261
BIA Brick Institute of America 11490 Commerce Park Dr. Reston, VA 22091	(703) 620-0010
BIFMA Business and Institutional Furniture Manufacturers Assoc. 2335 Burton, SE Grand Rapids, MI 49506	(616) 243-1681
CAGI Compressed Air and Gas Institute c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2851	(216) 241-7333
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(212) 582-6884
916) 920-6951
216) 241-0711
(203) 637-1312
212) 251-7200
216) 241-7333
(703) 979-0900
(708) 833-1919
615) 892-0137
(706) 278-3176
(708) 517-1200

(213) 660-1911 (818) 889-8453
()
(703) 222-2010
(205) 988-9870
(312) 922-6222
(0.1) 011 0111
(202) 628-6380
(202) 457-4900
(813) 726-6477
(914) 332-0040
(607) 753-6711
(201) 820-0000
(201) 023-0330
(913) 266-7013

FM Factory Mutual Research Organization 1151 Boston-Providence Turnpike (P.O. Box 9102) Norwood, MA 02062	(617) 762-4300
FTI Facing Tile Institute P.O. Box 8880 Canton, OH 44711	(216) 488-1211
GA Gypsum Association 810 First St., NE, Suite 510 Washington, DC 20002	(202) 289-5440
HEI Heat Exchange Institute c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2851	(216) 241-7333
HI Hydronics Institute P.O. Box 218 35 Russo Place Berkeley Heights, NJ 07922	(908) 464-8200
H.I. Hydraulic Institute 9 Sylvan Way Parsippany, NJ 07054-3802	(201) 267-9700
HMA Hardwood Manufacturers Assoc. 400 Penn Center Blvd. Pittsburgh, PA 15235	(412) 829-0770
HPVA Hardwood Plywood and Veneer Assoc. 1825 Michael Farraday Dr. P.O. Box 2789 Reston, VA 22090	(703) 435-2900
IBD Institute of Business Designers 341 Merchandise Mart Chicago, IL 60654	(312) 647-1950
ICEA Insulated Cable Engineers Association, Inc. P.O. Box 440 South Yarmouth, MA 02664	(508) 394-4424
IEC International Electrotechnical Commission (Availa 1430 Broadway New York, NY 10018	able from ANSI) (212) 354-3300
IEEE Institute of Electrical and Electronic Engineers 345 E. 47th St. New York, NY 10017	(212) 705-7900
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IESNA Illuminating Engineering Society of North America 345 E. 47th St.	
New York, NY 10017	(212) 705-7926
IGCC Insulating Glass Certification Council c/o ETL Testing Laboratories, Inc. P.O. Box 2040	
Route 11, Industrial Park Cortland, NY 13045	(607) 753-6711
ILI Indiana Limestone Institute of America Stone City Bank Building, Suite 400	
Bedford, IN 47421	(812) 275-4426
IMSAInternational Municipal Signal Assoc. P.O. Box 539	
Newark, NY 14513	(315) 331-2182
IRI Industrial Risk Insurers 85 Woodland St.	
Hartford, CT 06102	(203) 520-7300
ISA Instrument Society of America (P.O. Box 12277) 67 Alexander Dr. Research Triangle Park, NC 27709	(919) 549-8411
KCMA Kitchen Cabinet Manufacturers Assoc.	
1899 Preston White Dr. Reston, VA 22091-4326	(703) 264-1690
LIA Lead Industries Association, Inc. 295 Madison Ave.	
New York, NY 10017	(212) 578-4750
LPI Lightning Protection Institute 3365 N. Arlington Heights Rd., Suite J Arlington Heights, IL 60004	(800) 488-6864
MBMA Metal Building Manufacturer's Assoc. c/o Thomas Associates, Inc.	
Cleveland, OH 44115-2851	(216) 241-7333

MCAA Mechanical Contractors Association of America 1385 Piccard Dr. Rockville, MD 20850-4329	(301) 869-5800
MFMA Maple Flooring Manufacturers Assoc. 60 Revere Dr., Suite 500 Northbrook, IL 60062	(708) 480-9138
MIA Marble Institute of America 33505 State St. Farmington, MI 48335	(313) 476-5558
ML/SFA Metal Lath/Steel Framing Assoc. (A Division of the National Association of Architectural Metal Manufacture 600 S. Federal St., Suite 400 Chicago JL 60605	ers)
	(312) 922-0222
MSS Manufacturers Standardization Society of the Valve and Fittings Indu 127 Park St., NE Vienna, VA 22180	ıstry (703) 281-6613
NAA National Arborist Assoc. The Meeting Place Mall Route 101, P.O. Box 1094 Amherst, NH 03031-1094	(603) 673-3311
NAAMM National Association of Architectural Metal Manufacturers 600 S. Federal St., Suite 400 Chicago, IL 60605	(312) 922-6222
NAIMA North American Insulation Manufacturers Assoc. 44 Canal Center Plaza, Suite 310 Alexandria, VA 22314	(703) 684-0084
NAPA National Asphalt Pavement Assoc. NAPA Building 5100 Forbes Blvd. Lanham, MD 20706-4413	(301) 731-4748
NAPF National Association of Plastic Fabricators (Now DLPA)	
NBGQA National Building Granite Quarries Assoc. P.O. Box 482	
Barre, VT 05641	(802) 476-3115

NBHA National Builders Hardware Assoc. (Now DHI)	
NCMA National Concrete Masonry Assoc. 2302 Horse Pen Rd. Herndon, VA 22071-3406	(703) 435-1900
NCPI National Clay Pipe Institute P.O. Box 759 253-80 Center St. Lake Geneva, WI 53147	(414) 248-9094
NCRPM National Council on Radiation Protection and Measurements 7910 Woodmont Ave., Suite 800 Bethesda, MD 20814	(301) 657-2652
NCSPA National Corrugated Steel Pipe Association 2011 Eye St., NW Washington, DC 20006	(202) 223-2217
NEC National Electrical Code (from NFPA)	
NECA National Electrical Contractors Assoc. 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814	(301) 657-3110
NEII National Elevator Industry, Inc. 185 Bridge Plaza, North Fort Lee, NJ 07024	(201) 944-3211
NEMA National Electrical Manufacturers Assoc. 2101 L St., NW, Suite 300 Washington, DC 20037	(202) 457-8400
NETA International Electrical Testing Assoc. P.O. Box 687 Morrison, CO 80465	(303) 467-0526
NFPA National Fire Protection Assoc. One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101	(617) 770-3000 (800) 344-3555
N.F.P.A.National Forest Products Assoc. (See AFPA. Now known as the American Wood Council of the American Forest and Paper Assoc).	

NHLA National Hardwood Lumber Assoc. P.O. Box 34518 Memphis, TN 38184-0518	(901) 377-1818
NKCA National Kitchen Cabinet Assoc. (Now KCMA)	
NLGA National Lumber Grades Authority 1055 W. Hastings St., Suite 260 Vancouver, British Columbia Canada V6E 2E9	(604) 687-2171
NOFMA National Oak Flooring Manufacturers Assoc. P.O. Box 3009 Memphis, TN 38173-0009	(901) 526-5016
NPA National Particleboard Assoc. 18928 Premiere Court Gaithersburg, MD 20879	(301) 670-0604
NPCA National Paint and Coatings Assoc. 1500 Rhode Island Ave., NW Washington, DC 20005	(202) 462-6272
NRCA National Roofing Contractors Assoc. 10255 W. Higgins Rd., Suite 600 Rosemont, IL 60018-5607	(708) 299-9070
NSF National Sanitation Foundation 3475 Plymouth Rd. P.O. Box 130140 Ann Arbor, MI 48113-0140	(313) 769-8010
NSSEA National School Supply and Equipment Assoc. 8300 Colesville Rd., No. 250 Silver Spring, MD 20910	(301) 495-0240
NTMANational Terrazzo and Mosaic Assoc. 3166 Des Plaines Ave., Suite 132 Des Plaines, IL 60018	(708) 635-7744
NWMA National Woodwork Manufacturers Assoc. (Now NWWDA)	
NWWDA National Wood Window and Door Assoc. 1400 E. Touhy Ave., #G54 Des Plaines, IL 60018	(708) 299-5200 (800) 223-2301

PATMI Power Actuated Tool Manufacturers' Institute, Inc. 1000 Fairgrounds Rd., Suite 200 St. Charles, MO 63301	(314) 947-6610
PCA Portland Cement Assoc. 5420 Old Orchard Road Skokie, IL 60077	(708) 966-6200
PCI Precast/Prestressed Concrete Institute 175 W. Jackson Blvd. Chicago, IL 60604	(312) 786-0300
PDI Plumbing and Drainage Institute c/o Sol Baker 1106 W. 77th St., South Dr. Indianapolis, IN 46260	(317) 251-6970
PEI Porcelain Enamel Institute 1101 Connecticut Ave., NW, Suite 700 Washington, DC 20036	(202) 857-1134
RFCI Resilient Floor Covering Institute 966 Hungerford Dr., Suite 12-B Rockville, MD 20805	(301) 340-8580
RIS Redwood Inspection Service 405 Enfrente Dr., Suite 200 Novato, CA 94949	(415) 382-0662
RMA Rubber Manufacturers Assoc. 1400 K St., NW Washington, DC 20005	(202) 682-4800
SDI Steel Deck Institute P.O. Box 9506 Canton, OH 44711	(216) 493-7886
S.D.I. Steel Door Institute 30200 Detroit Road Cleveland, OH 44145	(216) 889-0010
SGCC Safety Glazing Certification Council c/o ETL Testing Laboratories Route 11, Industrial Park Cortland, NY 13045	(607) 753-6711

SHLMA Southern Hardwood Lumber Manufacturers Assoc. (N	Now HMA)
SIGMA Sealed Insulating Glass Manufacturers Assoc. 401 N. Michigan Ave. Chicago, IL 60611	(312) 644-6610
SJI Steel Joist Institute 1205 48th Avenue North, Suite A Myrtle Beach, SC 29577	(803) 449-0487
SMA Screen Manufacturers Assoc. 3950 Lake Shore Dr., Suite 502-A Chicago, IL 60613-3431	(312) 525-2644
SMACNA Sheet Metal and Air Conditioning Contractors Nationa 4201 Lafayette Center Dr. Chantilly, VA 22021	al Assoc. (703) 803-2980
SPIB Southern Pine Inspection Bureau 4709 Scenic Highway Pensacola, FL 32504	(904) 434-2611
SPRI Single Ply Roofing Institute 20 Walnut St. Wellesley Hills, MA 02181	(617) 237-7879
SSPC Steel Structures Painting Council 4400 Fifth Ave. Pittsburgh, PA 15213-2683	(412) 268-3327
SSPMA Sump and Sewage Pump Manufacturers Assoc. P.O. Box 298 Winnetka, IL 60093	(708) 835-8911
STI Steel Tank Institute 570 Oakwood Rd. Lake Zurich, IL 60047	(708) 438-8265
SWI Steel Window Institute c/o Thomas Associates, Inc. 1300 Sumner Ave, Cleveland, OH 44115, 2851	(216) 241 7222
SWPA Submersible Wastewater Pump Assoc.	(210) 241-7333
Chicago, IL 60605	(312) 922-6222

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TCA Tile Council of America	
Princeton, NJ 08542-0326	(609) 921-7050
TIMAThermal Insulation Manufacturers Assoc. (This Org	anization is now defunct.)
TPI Truss Plate Institute 583 D'Onofrio Dr., Suite 200 Madison, WI 53719	(608) 833-5900
UL Underwriters Laboratories 333 Pfingsten Rd. Northbrook, IL 60062	(708) 272-8800
UNI Uni-Bel PVC Pipe Assoc. 2655 Villa Creek Dr., Suite 155 Dallas, TX 75234	(214) 243-3902
USP U.S. Pharmacopoeial Convention 12601 Twinbrook Parkway Rockville, MD 20852	(301) 881-0666
WA Wallcovering Assoc. 401 N. Michigan Ave. Chicago, IL 60611-4267	(312) 644-6618
WCLIB West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97223	(503) 639-0651
WIC Woodwork Institute of California P.O. Box 11428 Fresno, CA 93773-1428	(209) 233-9035
WLPDIA Western Lath, Plaster, Drywall Industries Assoc. (Formerly California Lath & Plaster Assoc. 8635 Navajo Rd.	(610) 466 0070
San Diego, CA 92119	(619) 400-9070
WRI Wire Reinforcement Institute 1101 Connecticut Ave. NW, Suite 700 Washington, DC 20036-4303	(202) 429-5125
WSC Water Systems Council 600 S. Federal St., Suite 400 Chicago, IL 60605	(312) 922-6222

WSFI Wo 4415 W. Hillside, I	ood and Synthetic Flooring Institute Harrison St., Suite 242-C IL 60162	(708) 449-2933
WWPA W Yeon Bu 522 SW Portland,	Vestern Wood Products Assoc. ilding 5th Ave. OR 97204-2122	(503) 224-3930
W.W.P.A 2515 N. I Chicago,	a. Woven Wire Products Assoc. Nordica Ave. IL 60635	(312) 637-1359
G.	Federal Government Agencies: Names and titles of federal standard- or Specification-producing agencies are often ab following acronyms or abbreviations referenced in the Contribution of standard- or Specification-producing agencies government. Names and addresses are subject to change and are not assured, to be accurate and up-to-date as of the date Documents.	eral government breviated. The tract Documents es of the federal are believed, but of the Contract
CE Corp Chief of I Washing	s of Engineers (U.S. Department of the Army) Engineers - Referral ton, DC 20314	(202) 272-0660
CFR Code of Federal Regulations (Available from the Government Printing Office)		
N. Capitol St. between G and H St. NW Washington, DC 20402 (Material is usually first published in the "Federal Register")		(202) 783-3238
CPSC C	onsumer Product Safety Commission	
Bethesda	a, MD 20207	(800) 638-2772
CS Com Governm Washing	mercial Standard (U.S. Department of Commerce) nent Printing Office ton, DC 20402	(202) 783-3238
DOC De 14th St. a Washing	partment of Commerce and Constitution Ave., NW ton, DC 20230	(202) 482-2000
DOT Dep 400 Seve Washing	partment of Transportation enth St., SW ton, DC 20590	(202) 366-4000

EPA Environmental Protection Agency 401 M St., SW Washington, DC 20460	(202) 382-2090
FAA Federal Aviation Administration (U.S. Department of Transportation) 800 Independence Ave., SW Washington, DC 20590	(202) 366-4000
FCC Federal Communications Commission 1919 M St., NW Washington, DC 20554	(202) 632-7000
FDA Food and Drug Administration 5600 Fishers Lane Rockville, MD 20857	(301) 443-1544
FHA Federal Housing Administration (U.S. Department of Housing and Urban Development) 451 Seventh St., SW Washington, DC 20201	(202) 708-1422
FS Federal Specification (from GSA) Specifications Unit (WFSIS) 7th and D St., SW Washington, DC 20407	(202) 708-9205
GSA General Services Administration F St. and 18th St., NW Washington, DC 20405	(202) 708-5082
MIL Military Standardization Documents (U.S. Department of Defense) Naval Publications and Forms Center 5801 Tabor Ave. Philadelphia, PA 19120	
NIST National Institute of Standards and Technology (U.S. Department of Gaithersburg, MD 20899	Commerce) (301) 975-2000
OSHA Occupational Safety and Health Administration (U.S. Department of 200 Constitution Ave., NW	of Labor)
Washington, DC 20210	(202) 219-6091
PS Product Standard of NBS (U.S. Department of Commerce) Government Printing Office Washington, DC 20402	(202) 783-3238

REA Rural Electrification Administration (U.S. Department of Agriculture) 14th St. and Independence Ave., SW	
Washington, DC 20250	(202) 447-2791
USDA U.S. Department of Agriculture	
Washington, DC 20250	(202) 720-2791
USPS U.S. Postal Service	
475 L'Enfant Plaza, SW	
Washington, DC 20260-0010	(202) 268-2000

1.5 GOVERNING REGULATIONS AND AUTHORITIES

A. Copies of Regulations: Obtain copies of the following regulations and retain at the Project Site to be available for reference by parties who have a reasonable need.

1.6 <u>SUBMITTALS</u>

A. Permits, Licenses, and Certificates: For the 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 in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION

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SECTION 01 45 00 INSPECTIONS - QUALITY CONTROL SERVICES IBC CHAPTER 1 - INSPECTIONS

PART 1 - GENERAL

1-01 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-00 Specification Sections, apply to this Section.

1-02 <u>SUMMARY:</u>

- A. This Section specifies administrative and procedural requirements for IBC Chapter 1-Inspections.
- B. The agency will contract with a firm, outside of the construction contract, to perform Chapter 1 & 17 inspections.
- C. Special Inspection services include inspections and tests and related actions including reports, performed by independent agencies. They do not include Contract enforcement activities performed by the Architect.
- D. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
- E. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
 - Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.
 - 2 Inspections, test and related actions specified are not intended to limit the Contractors quality control procedures that facilitate compliance with Contract Document requirements.
 - 3. Requirements for the Contractor to provide quality control services required by the Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.

1-03 **RESPONSIBILITIES**:

- A. Contractor Responsibilities: The contractor shall provide inspections, tests and similar quality control services, specified in this Section and in individual Specification Sections and required by governing authorities. These services include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be part of the Contract Sum.
 - 1. The Owner shall employ and pay an independent agency, to perform specified quality control services.
 - 2. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Owner's responsibility.
 - a. Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.
 - 3. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:
 - a. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
 - b. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
 - c. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
 - d. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
 - e. Security and protection of samples and test equipment at the project site.
- B. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Architect and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.
 - 1. The agency shall notify the Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
 - 3. The agency shall not perform any duties of the Contractor.

- C. COORDINATION: The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate requirement services with a minimum of delay. In addition, the Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
 - 1. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1-04 SUBMITTALS:

- A. The independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Architect, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test or similar service through the Contractor, in duplicate.
 - 1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.
 - 2. Report Data: Written reports of each inspection, test or similar service shall included, but not be limited to:
 - a. Date of issue.
 - b. Project title and number.
 - c. Name, address and telephone number of testing agency.
 - d. Dates and locations of samples and tests or inspections.
 - e. Names of individuals making the inspection or test.
 - f. Designation of the Work and test method.
 - g. Identification of product and Specification Section.
 - h. Complete inspection or test data.
 - i. Test results and an interpretation of test results.
 - j. Ambient conditions at the time of sample-taking and testing.
 - k. Comments or professional opinion as to whether inspection or tested Work complies with Contract Document requirements.
 - I. Name and signature of laboratory inspector.
 - m. Recommendations on retesting.

1-05 **QUALITY ASSURANCE:**

A. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3-01 REPAIR AND PROTECTION:

- A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for "Cutting and Patching".
- B. Protect construction exposed by or for quality control service activities, and protect repaired construction.
- C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

PART 4 - INSPECTIONS

- **4-01** Chapter 1 Inspections include, but are not limited to the following:
 - A. 109.3.1 Footing or foundation inspection
 - B. 109.3.2 Concrete slab or under-floor inspection
 - C. 109.3.3 Lowest floor elevation
 - D. 109.3.4 Frame inspection
 - E. 109.3.7Energy efficiency inspections
 - F. 909.3 Special inspection and test requirements. (Smoke control systems)
 - G S406.6.6 Inspection of fill. Placement of the fill material shall be inspected by the code official.
 - H. RR109.1.1 Foundation inspection. Inspection of the foundation shall be made after poles or piers or trenches or basement areas are excavated and any required forms erected and any require reinforcing steel is in place prior to the placing of concrete. The foundation inspection shall include excavations for thickened slabs intended for the support of bearing walls, partitions, structural supports, or equipment.
 - I. RR109.1.2 Plumbing, mechanical, gas, and electrical systems inspection. Rough inspection of plumbing, appliances are set or installed, and prior to framing inspection.

Mechanical Code: M107.1 Required Inspections

- 1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before backfill is put in place.
- 2. Rough-in inspection shall be made after the roof, framing, fireblocking and bracing are in place and all ducting and other components to be concealed are complete, and prior to the installation of wall or ceiling membranes.

Plumbing Code: P107.1 Required Inspections and Testing

- 1. Underground inspection shall be made after trenches or ditches are excavated and bedded, piping installed, and before any backfill is put in place.
- 2. Rough-in inspection shall be made after the roof, framing, fireblocking, firestopping, draftstopping, and bracing is in place and all sanitary, storm and water distribution piping is roughed-in and prior to the installation of wall or ceiling membranes.

Electrical Code:

- 1. Underground inspection shall be made after trenches or ditches are excavated and bedded, conduit installed, and before backfill is placed.
- 2. Rough-in inspection shall be made after the roof, framing, fireblocking, and bracing are in place and other components to be concealed are complete, and prior to the installation of concealing construction.

END OF SECTION

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SECTION 01 50 00 - TEMPORARY FACILITIES

PART ONE - GENERAL

1-01 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.

1-02 <u>SUMMARY</u>

- A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
- B. Temporary utilities required include but are not limited to:
 - 1. Water service and distribution.
 - 2. Temporary electric power and light.
 - 3. Telephone service.
 - 4. Storm and sanitary sewer.
- C. Temporary construction and support facilities required include but are not limited to:
 - 1. Temporary heat.
 - 2. Field offices and storage sheds.
 - 3. Temporary roads and paving.
 - 4. Sanitary facilities, including drinking water.
 - 5. Dewatering facilities and drains.
 - 6. Temporary enclosures.
 - 7. Hoists and temporary elevator use.
 - 8. Temporary Project identification signs and bulletin boards.
 - 9. Waste disposal services.
 - 10. Rodent and pest control.
 - 11. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities required include but are not limited to:
 - 1. Temporary fire protection.
 - 2. Barricades, warning signs, lights.
 - 3. Sidewalk bridge or enclosure fence for the site.
 - 4. Environmental protection.

1-03 <u>SUBMITTALS</u>

- A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.
- B. Implementation and Termination Schedule: Submit a schedule indicating implementation and termination of each temporary utility within 15 days of the date established for commencement of the Work.

1-04 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
 - 1. Building Code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, Fire Department and Rescue Squad rules.
 - 5. Environmental protection regulations.
- B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
 - 1. Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC, for industry recommendations.
 - 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).
- C. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1-05 **PROJECT CONDITIONS**

- A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART TWO - PRODUCTS

2-01 <u>MATERIALS</u>

- A. General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.
- B. Lumber and Plywood: Comply with requirements in Division-6 Section "Rough Carpentry."
 - 1. For job-built temporary offices, shops and sheds within the construction area, provide UL labeled, fire treated lumber and plywood for framing, sheathing and siding.
 - 2. For signs and directory boards, provide exterior type, Grade B-B High Density Concrete Form Overlay Plywood conforming to PS-1, of sizes and thickness indicated.
 - 3. For fences and vision barriers, provide exterior type, minimum 3/8" thick plywood.
 - 4. For safety barriers, sidewalk bridges and similar uses, provide minimum 5/8" thick exterior plywood.
- C. Paint: Comply with requirements of Division-9 Section "Finish Painting."
 - 1. For sign panels and applying graphics, provide exterior grade alkyd gloss enamel over exterior primer.
- D. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.
- E. Water: Provide potable water approved by local health authorities.
- F. Open-Mesh Fencing: Provide 11-gage, galvanized 2-inch, chain link fabric fencing 6-feet high with galvanized barbed wire top strand and galvanized steel pipe posts, 1-1/2" I.D. for line posts and 2-1/2" I.D. for corner posts.

2-02 <u>EQUIPMENT</u>

- A. General: Provide new equipment; if acceptable to the Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.
- B. Water Hoses: Provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of

the water distribution system; provide adjustable shut-off nozzles at hose discharge.

- C. Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.
- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the type of fuel being consumed.
- G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows and serviceable finishes. Provide heated and air- conditioned units on foundations adequate for normal loading.
- H. Temporary Toilet Units: Provide self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material.
- I. First Aid Supplies: Comply with governing regulations.
- J. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.
 - 1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

PART THREE - EXECUTION

3-01 INSTALLATION

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

3-02 TEMPORARY UTILITY INSTALLATION

- A. General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.
 - 1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.
 - 4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect, and will not be accepted as a basis of claims for a Change Order.
- B. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
 - 1. Sterilization: Sterilize temporary water piping prior to use.
- C. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.
 - 1. Except where overhead service must be used, install electric power service underground.
 - 2. Power Distribution System: Install wiring overhead, and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, AC 20 ampere rating, and lighting circuits may be

nonmetallic sheathed cable where overhead and exposed for surveillance.

- D. Temporary Lighting: Whenever overhead floor or roof deck has been installed, provide temporary lighting with local switching.
 - 1. Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.
- E. Temporary Telephones and Fax: Provide temporary telephone and fax service for all personnel engaged in construction activities, throughout the construction period. Install telephone on a separate line for each temporary office and first aid station. Where an office has more than two occupants, install a telephone for each additional occupant or pair of occupants.
 - 1. At each telephone, post a list of important telephone numbers.
- F. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.
 - 1. Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.
 - 2. Connect temporary sewers to the municipal system as directed by the sewer department officials.
 - 3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.
- G. Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

3-03 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

- A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access.
 - 1. Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

- B. Provide incombustible construction for offices, shops and sheds located within the construction area, or within 30 feet of building lines. Comply with requirements of NFPA 241.
- C. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
- D. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.
- E. Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:
- F. Storage and Fabrication Sheds: Install storage and fabrication sheds, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on the site.
- G. Temporary Paving: Construct and maintain temporary roads and paving to adequately support the indicated loading and to withstand exposure to traffic during the construction period. Locate temporary paving for roads, storage areas and parking where the same permanent facilities will be located. Review proposed modifications to permanent paving with the Architect.
 - 1. Paving: Comply with Division-2 Section "Asphalt Concrete Paving" for construction and maintenance of temporary paving.
 - 2. Coordinate temporary paving development with sub-grade grading, compaction, installation and stabilization of sub-base, and installation of base and finish courses of permanent paving.
 - 3. Install temporary paving to minimize the need to rework the installations and to result in permanent roads and paved areas that are without damage or deterioration when occupied by the Owner.
 - 4. Delay installation of the final course of permanent asphalt concrete paving until immediately before Substantial Completion. Coordinate with weather conditions to avoid unsatisfactory results.
 - 5. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration and supervision.

- H. Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.
 - 1. Provide toilet tissue, paper towels, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.
- I. Existing Toilets: Use of the Owner's existing toilet facilities will not be permitted.
- J. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.
- K. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
 - 1. Provide safety showers, eye-wash fountains and similar facilities for convenience, safety and sanitation of personnel.
- L. Drinking Water: Provide drinking water where indicated, including paper supply.
- M. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division-2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.
- N. Temporary Enclosures: Provide temporary enclosure for protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.
 - 1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 - 2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
 - 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.
 - 4. Where temporary wood or plywood enclosure exceeds 100 square feet in area, use UL-labeled fire-retardant treated material for framing and main sheathing.

- O. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- P. Project Identification and Temporary Signs: Prepare project identification and other signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the Project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.
 - 1. Project Identification Signs: Engage an experienced sign painter to apply graphics. Comply with details indicated.
 - 2. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.
- Q. Temporary Exterior Lighting: Install exterior yard and sign lights so that signs are visible when Work is being performed.
- R. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F (27 deg C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
- S. Rodent and Pest Control: Before deep foundation Work has been completed, retain a local exterminator or pest control company to recommend practices to minimize attraction and harboring of rodents, roaches and other pests. Employ this service to perform extermination and control procedures at regular intervals so the Project will be relatively free of pests and their residues at Substantial Completion. Perform control operations in a lawful manner using environmentally safe materials.
- T. Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Cover finished permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

3-04 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Except for use of permanent fire protection as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer as requested by the Architect.
- B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of

the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."

- 1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.
- 2. Store combustible materials in containers in fire-safe locations.
- 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
- 4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.
- C. Permanent Fire Protection: At the earliest feasible date in each area of the Project, complete installation of the permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
- D. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
- E. Enclosure Fence: When excavation begins, install an enclosure fence with lockable entrance gates. Locate where indicated, or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs and other animals from easily entering the site, except by the entrance gates.
 - 1. Provide open-mesh, chain-link fencing with posts set in a compacted mixture of gravel and earth.
 - 2. Provide plywood fence, 8-feet high, framed with four 2" x 4" rails, and preservative treated wood posts spaced not more than 8-feet apart.
- F. Covered Walkway: Erect a structurally adequate protective covered walkway for passage of persons along the adjacent public street. Coordinate with entrance gates, other facilities and obstructions. Comply with regulations of authorities having jurisdiction.
 - 1. Construct using scaffold or shoring framing, waterproofed wood plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe and well- drained walkways and similar provisions for protection and safe passage. Extend the backwall beyond the structure to complete the enclosure fence. Paint and maintain in a manner acceptable to the Owner and Architect.
- G. Security Enclosure and Lockup: Install substantial temporary enclosure of partially completed areas of construction. Provide locking entrances to

prevent unauthorized entrance, vandalism, theft and similar violations of security.

- 1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- H. Environmental Protection: Provide protection, operate temporary facilities and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3-05 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
 - 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
 - 2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of Project identification signs.
 - 2. Remove temporary paving that is not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances which might impair growth of plant

materials or lawns. Repair or replace street paving, curbs and sidewalks at the temporary entrances, as required by the governing authority.

- 3. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
 - a. Replace air filters and clean inside of ductwork and housings.
 - b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
 - c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION

SECTION 01 70 00 - CONSTRUCTION SUPERVISION (SUPERINTENDENT)

PART ONE - GENERAL

1-01 WORK INCLUDED:

- (A) The general contractor shall employ a full-time superintendent for supervision of construction and coordination of trades to maintain compliance with the contract documents.
- (B) Related Work: Documents affecting work of this Section include, but are not necessarily limited to General Conditions, Supplementary Conditions, and Sections in Division 00 of these specifications.

1-02 **QUALITY ASSURANCE**:

- (A) The general contractor's superintendent shall have not less than five (5) years direct experience in construction of the type and extent presented by this contract.
- (B) The superintendent shall have training and experience in reading contract documents and in interpreting all types of contract documents presented by this contract, architectural and engineering.

1-03 SUBMITTALS:

- (A) Upon request of architect, submit data demonstrating qualifications of person or persons the contractor proposes to engage as a construction superintendent. Such submittal is subject to approval by the architect.
- (B) Should the general contractor propose using multiple superintendents for specialty oversight or periods of limited duration; a submittal of intent, qualifications and job descriptions shall be mandatory for each superintendent proposed. Such submittal is subject to approval by the architect.
- (C) Rejection of any individual (s) for failure to meet the Quality standards established shall be the reserved right of the architect and such a decision shall be final.

1-04 **RESPONSIBILITIES**:

- (A) It is understood that the superintendent is the direct employee of the general contractor and the primary "charge of responsibilities," "job description", or "terms of employment", shall be established by the general contractor. However, the following responsibilities shall be considered as a minimum requirement for any person acting as construction superintendent under this contract.
 - (1) The superintendent shall be on the job site at all times during the forty (40) hour standard week as established by the contractor and/or shall be on the job site at any time a trade or subcontractor other than those forces directly employed by the general contractor are executing work under this contract.

- (2) The superintendent shall be familiar with the work in progress during all phases of construction, including the manpower on the project and the status of each trade's progress.
- (3) All coordination between the owner's agents or normal operation in association with the construction site shall be the responsibility of the superintendent.
- (4) The superintendent shall remain on the project from the Notice to Proceed throughout the punch-list process, unless multiple superintendents have been approved as outlined under paragraph 1.04.

1-05 REPLACEMENT RESIGNATION OR TERMINATION:

- (A) Should the construction superintendent become ill, take vacation, or be absent from the project site for any extended period of time, the general contractor shall apprize the architect of the circumstances and duration of such absence, and provide a competent replacement for the period involved.
- (B) Should the construction superintendent resign or be terminated from the employment of the general contractor, the architect shall be apprized and qualifications of the proposed replacement superintendent shall be presented as indicated in 1.03 and 1.04 of this Section.

1-06 ARCHITECT'S AUTHORITY TO REPLACE:

- (A) The architect reserves the right to assess the performance of the superintendent for compliance with the Quality standards and minimum responsibilities as established in this Section. Should the superintendent fail to meet this criteria; in the opinion of the architect, the architect may require the general contractor to replace the superintendent.
- (B) Should such a replacement be requested, the general contractor shall present qualifications of the replacement superintendent in accordance with the provisions of this specification Section within seven (7) calendar days.

1-07 PENALTY FOR REMOVING OR REPLACING JOB SUPERINTENDENT:

Penalty for removing or replacing job superintendent if the superintendent is removed by the contractor for any other reason than noted above, the contractor shall be penalized liquidated damages in the amount of Five Hundred and No/100 (\$500.00) Dollars per calendar day for each day the contractor is not on site.

End of Section

SECTION 01 73 29 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 <u>SUMMARY</u>

- A. This Section specifies administrative and procedural requirements for cutting and patching.
- B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - 1. Requirements of this Section apply to mechanical and electrical installations. Refer to Division-23 and Division-26 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.
- C. Demolition of selected portions of the building for alterations is included in Section "Selective Demolition."

1.3 <u>SUBMITTALS</u>

- A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
 - 1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
 - Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
 - 3. List products to be used and firms or entities that will perform Work.
 - 4. Indicate dates when cutting and patching is to be performed.
 - 5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.

- 6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure.
- 7. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of a part of the Work found to be unsatisfactory.

1.4 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
 - 1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:
 - a. Foundation construction.
 - b. Bearing and retaining walls.
 - c. Structural concrete.
 - d. Structural steel.
 - e. Lintels.
 - f. Timber and primary wood framing.
 - g. Structural decking.
 - h. Stair systems.
 - i. Miscellaneous structural metals.
 - j. Exterior curtain wall construction.
 - k. Equipment supports.
 - I. Piping, ductwork, vessels and equipment.
 - m. Structural systems of special construction in Division-13.
- B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.
 - 1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:
 - a. Shoring, bracing, and sheeting.
 - b. Primary operational systems and equipment.
 - c. Air or smoke barriers.
 - d. Water, moisture, or vapor barriers.
 - e. Membranes and flashings.
 - f. Fire protection systems.
 - g. Noise and vibration control elements and systems.
 - h. Control systems.
 - i. Communication systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - I. Special construction specified by Division-13 Sections.

- C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.
 - 1. If possible retain the original installer or fabricator to cut and patch the following categories of exposed Work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:
 - a. Processed concrete finishes.
 - b. Matched-veneer woodwork.
 - c. Stucco.
 - d. Acoustical ceilings.
 - e. Carpeting.
 - f. Wall covering.
 - g. HVAC enclosures, cabinets or covers.

PART 2 - PRODUCTS

2.1 <u>MATERIALS</u>

- A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.
- B. Plaster: Comply with ASTM C 842.
 - 1. Base Coat: Ready-mixed, sand aggregate gypsum plaster base.
 - 2. Finish Coat: Ready-mixed gypsum finish plaster.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.
 - 1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 **PREPARATION**

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 PERFORMANCE

- A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review proposed procedures with the original installer; comply with the original installer's recommendations.
 - 1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
 - 4. Comply with requirements of applicable Sections of Division-2 where cutting and patching requires excavating and backfilling.
 - 5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
- C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

- 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
- 2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
- 3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.
 - a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.
- 4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.
- D. Plaster Installation: Comply with manufacturer's instructions and install thickness and coats as indicated.
 - 1. Unless otherwise indicated provide 3-coat Work.
 - 2. Finish gypsum plaster with smooth-troweled finish. Sand lightly to remove trowel marks and arrises.
 - 3. Cut, patch, point-up and repair plaster to accommodate other construction and to restore cracks, dents and imperfections.

3.4 <u>CLEANING</u>

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION
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SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 <u>SUMMARY</u>

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous construction waste.
 - 2. Recycling nonhazardous construction waste.
 - 3. Disposing of nonhazardous construction waste.
- B. Related Sections:
 - 1. Division 01 Section "Sustainable Design Green Globes."

1.2 **DEFINITIONS**

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.3 **PERFORMANCE REQUIREMENTS**

Achieve end-of-Project rates for salvage/recycling of at least **75** percent by weight of total non-hazardous solid waste generated by the Work.

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

- a. Site-clearing waste.
- b. Masonry and CMU.
- c. Lumber.
- d. Wood sheet materials.
- e. Wood trim.
- f. Metals.
- g. Roofing.
- h. Insulation.
- i. Carpet and pad.
- j. Gypsum board.
- k. Piping.
- I. Electrical conduit.
- m. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.

1.4 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 30 days of date established for the Notice to Proceed

1.5 **INFORMATIONAL SUBMITTALS**

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.
 - 5. Quantity of waste recycled, both estimated and actual in tons.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.6 QUALITY ASSURANCE

A. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.7 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements of this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.

- 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
- 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
- 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 RECYCLING CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.3 <u>RECYCLING CONSTRUCTION WASTE</u>

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Site-Clearing Wastes: Chip brush, branches, and trees.
- C. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- D. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.4 DISPOSAL OF WASTE

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

END OF SECTION

SECTION 01 74 23 – CLEAN UP

PART 1 - GENERAL

- A. Immediately after completion of the work or any substantial unit or portion of it, the contractor shall remove all unused material, refuse and dirt placed by him in the vicinity of the work and shall leave the premises in a neat and orderly condition, satisfactory to the Engineer.
- B. <u>Site</u>: The contractor shall clean up behind the work as much as is reasonably possible as the work progresses. Upon completion of the work, and before acceptance of, and final payment for the project by the owner, the contractor shall remove all of his surplus and discarded materials, excavated material and rubbish from the roadways, sidewalks, parking areas, lawns and all adjacent property; shall restore in an acceptable manner, all property, both public and private which has been disturbed or damaged during the prosecution of the work; and shall leave the whole site in a neat and presentable condition.

Where work is along streets or highways and dirt has been placed on the pavement, the pavement shall be swept clean of all dirt after backfill has been completed.

All equipment, trailers, temporary utilities and buildings belonging to the contractor shall be removed from the job site.

- C. <u>Building</u>: Clean up operations shall consistently be carried only the contractor to keep the premises free at all times from an accumulation of waste materials and rubbish. Upon completion of the work, he shall remove all rubbish, tools, scaffolding, surplus materials, etc., from the building and shall leave his work in a condition satisfactory to the Engineer. The general construction contractor shall do the following special cleaning for all trades upon completion of the work:
 - 1. Remove putty stains and paint from glass and wash and polish all glass. Do not scratch or otherwise damage glass.
 - 2. Remove all marks, stains, fingerprints and other soil and dirt from painted, stained and decorated work.
 - 3. Remove all temporary protections and clean and polish floors.
 - 4. Clean and polish all hardware for all trades. This shall include removal of all stains, dust, dirt, paint, etc.
- D. <u>Pipelines: Clean up along pipelines shall be accomplished as the work</u> progresses. In no case shall more than 1,000 feet of pipeline be left in an "un-cleaned up" condition. Any barricades or construction signs necessary for safety shall be left in place and maintained until the site, slopes, grass, etc. have stabilized.

END OF SECTION

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SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART ONE - GENERAL

1-01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 00 Specification Sections, apply to this Section.

1-02 <u>SUMMARY</u>

- B. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project Record Documents.
 - 3. Operation and maintenance manuals.
 - 4. Warranties.
 - 5. Instruction of the Owner's personnel.
 - 6. Final cleaning.
- C. Specific requirements of each contract are also indicated in individual Specification Sections, All Bid Documents and on Drawings.

1-03 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. GC to 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. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. 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.

- 6. Deliver tools, spare parts, extra materials, and similar items to location designated by the Owner. Label with manufacturer's name and model number where applicable.
- 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
- B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect & Owner 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 & Owner, that must be completed or corrected before certificate will be issued.
 - 1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
 - 2. Results of completed inspection will form the basis of requirements for Final Completion.

1-04 FINAL COMPLETION

- C. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
 - 1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
 - 2. 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.
 - 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 4. Final Completion must be achieved with 30 calendar days of Substantial Completion.
- D. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect & Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will accept for review, 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. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1-05 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

E. 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.

- F. Organize list of spaces in sequential order.
 - 1. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 2. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.

1-06 PROJECT RECORD DOCUMENTS

- G. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect & Owner, reference during normal working hours.
- H. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings.
 - 1. 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 cannot be readily identified and recorded 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.
 - d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.
 - 2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 - 3. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 - 5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

- 6. Provide a spreadsheet inventory list of all filters, sizes, locations, etc. prior to final completion / payment.
- I. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy 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. Note related Change Orders, Record Drawings, and Product Data, where applicable.
- J. Record Product Data: Submit one copy of each Product Data submittal. Mark one set to indicate the actual product installation where installation varies substantially from that indicated in Product Data.
 - 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 Drawings, and Record Specifications, where applicable.
- K. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1-07 WARRANTIES

- L. 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.
- M. Partial Occupancy: Submit properly executed warranties within 15 working days of completion of designated portions of the Work that are completed and occupied or used by The Presbyterian Communities during construction period.
- N. 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 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.
- O. Provide additional copies of each warranty to include in operation and maintenance manuals.
- P. Provide 3 copies of all closeout documents to Architect for distribution to Owner. This includes O & M Manuals, Project Documents, Approvals, Certificates, and all warranty information.

1-08 MAINTENANCE TRAINING/EQUIPMENT DEMONSTRATION VIDEOS

A. Equipment Demonstration Videos: The contractor shall have each equipment demonstration videotaped by the factory representative for all demonstrations provided at the school. The demonstrations shall be videoed during the actual presentation class at the site with the maintenance staff and contractor present. Video shall be easily viewed and set up on tripod for smooth picture quality.

Number of videos provided for each demonstration - two (2) copies.

The following video demonstrations are required as noted below.

- 1. Complete demonstration of the equipment and proper use of the HVAC System by the factory representative. This needs to be a comprehensive demonstration of the system itself, operational instructions, routine maintenance items, and emergency troubleshooting tips.
- 2. Complete demonstration of the Fire Alarm panel and system as well as working with troubles, etc.
- 3. Complete demonstration of any Fire Curtains and the resetting of such curtains.
- 4. Complete demonstration of the Electrical Switchgear as well as demonstration on adjustments that need to be made when power fluctuates.

PART TWO - PRODUCTS

2-01 <u>MATERIALS</u>

Q. 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 THREE – EXECUTION

3-01 FINAL CLEANING

- A. General: Provide final cleaning. Final Cleaning is the responsibility of the General Contractor. 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, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Pressure-wash all concrete and paved surfaces.
 - d. Rake grounds that are neither planted nor paved to a smooth, eventextured surface.
 - e. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - f. Remove snow and ice to provide for safe access to facility. Continue providing this service until substantial completion has been achieved.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults / closets, manholes, attics, mezzanines and similar spaces.
 - h. Sweep concrete floors broom clean with sweeping compound.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; have carpets professionally shampooed / cleaned if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision obscuring materials. Replace chipped or broken glass and other materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - I. 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.
 - m. Remove any paint from "UL" and similar labels, including mechanical and electrical nameplates.

- n. Wipe surfaces of mechanical and electrical equipment, elevator equipment and similar equipment. Remove excess lubrication, paint and mortar drippings, and other foreign substances.
- o. Replace parts subject to unusual operating conditions.
- p. Clean plumbing fixtures to a sanitary condition, free of stains, including stains from water exposure.
- q. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of all diffusers, registers and grilles.
- r. Clean ducts, blowers and coils.
- s. 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 / or noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- t. GC to be responsible for professional final cleaning of the interior of the building to include 3 coats of wax on all VCT.
- u. All fixtures to be wiped clean. Food Service equipment to be cleaned. The GC warrants that it will provide the facility in a "white glove test" condition to the Owner.
- v. GC to be responsible for final cleaning of building exterior to include windows and all horizontal and vertical surfaces.
- w. GC to pressure-wash all exterior hard surfaces.
- x. GC to provide the same cleaning as listed herein for adjacent spaces that have been affected by the construction process.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.
- D. Pest Control: Engage an experience, licensed exterminator to make a final inspection and rid Project of any rodents, insects, and other pests. Exterminator to provide a written report to Owner prior to Substantial Completion being awarded.

END OF SECTION

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SECTION 01 78 23 – OPERATIONS and MAINTENANCE DATA

PART ONE - GENERAL

1-01 DESCRIPTION

- A. Work included: To aid the continued instruction of operating and maintenance personnel, and to provide a positive source of information regarding the products incorporated into the Work, furnish and deliver the data described in this Section and in pertinent other sections of these Specifications.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, AIA Document A201 and Spec Sections 00 72 13-General Conditions and 00 73 00-Extension of General Conditions, found in Division 00 of these Specifications.
 - 2. Required contents of submittals also may be amplified in pertinent other Sections of these Specifications.

1-02 QUALITY ASSURANCE

A. In preparing data required by this Section, use only personnel who are thoroughly trained and experienced in operation and maintenance of the described items, completely familiar with the requirements of this Section, and skilled in technical writing to the extent needed for communicating the essential data.

1-03 SUBMITTALS

- A. Comply with pertinent provisions of General Conditions, as amended, and Division 01 Section 01 33 00 Submittal Procedures.
- B. Submit the Operation and Maintenance Manual to the Architect electronically in pdf format with Shop Drawing submittals and within sixty (60) days of the Notice to Proceed.
 - 1. Data Disk Submit three (3) data disks containing the project schedule shall be provided with all schedule submissions.
 - 2. File Medium Required data shall be submitted on Compact Disc.
 - 3. Disk Label A permanent exterior label shall be affixed to each disk submitted.
- C. Submit one (1) "Hard Copy" of the final Operation and Maintenance Manual and electronically in pdf form to the Architect prior to indoctrination of operation and maintenance personnel but no later than thirty (30) days after Date of Substantial Completion.

D. Submittals of approved copies of operation and maintenance data will be a prerequisite for approval of payment applications.

PART TWO - PRODUCTS

2-01 INSTRUCTION MANUALS

A. Where instruction Manuals are required to be submitted under other Sections of these Specifications, prepare in accordance with the provision of this Section.

B. Format:

- 1. Size: 8-1/2" x 11"
- 2. Paper: White bond, at least 20 lb. weight
- 3. Text: Neatly written or printed
- 4. Drawings: 11" in height, preferable; bind in with text; foldout acceptable; larger drawings acceptable but fold to fit within the Manual and provide a drawing pocket inside rear cover or bind in with text.
- 5. Flysheets: Separate each portion of the Manual with neatly prepared flysheets briefly describing contents of the ensuing portion; flysheets may be in color.
- 6. Binding: Use heavy-duty plastic or fiber
- 7. Measurements: Provide all measurements in U.S. standard units such as feet-and-inches, lbs, and cfm; where items may be expected to be measured within ten years in accordance with metric formula, provide additional measurements in the "International System of Units" (SI).
- C. Provide front and back covers for each Manual, using durable material approved by the Architect, and clearly identified on or through the cover with at least the following information:

- D. Contents: Include at least the following:
 - 1. Neatly typewritten index near the front of the Manual, giving immediate information as to location within the Manual of all emergency information regarding the installation.
 - 2. Complete instructions regarding the installation and maintenance of all equipment involved including lubrication, disassembly, and reassembly.

- 3. Complete nomenclature of all parts of all equipment.
- 4. Complete nomenclature and part number of all other data pertinent to procurement procedures.
- 5. Copy of all guarantees and warranties issued.
- 6. Manufacturer's bulletins, cuts, and descriptive data, where pertinent, clearly indicating the precise items included in this installation and deleting, or otherwise clearly indicating, all manufacturer's data.
- 7. Such other data as required in pertinent Sections of these Specifications.

PART THREE - EXECUTION

3-01 INSTRUCTION MANUALS

- A. Complete the Manuals in strict accordance with the approved preliminary drafts and the Program Manager's and Architect's review comments.
- B. Any and all other items required by the specific specifications relating to the maintenance and operations of the various components of the work or any and all certificates and testing reports required by the specific specifications shall be incorporated into the maintenance manuals. Items of this nature shall include but are not limited to:
 - 1. Test and balance reports of HVAC systems.
 - 2. Test and certification reports of electrical systems such as fire alarm and life safety systems, communications systems, clock systems, etc.
 - 3. Valve tag lists
 - 4. Certification of sterilization of potable water systems.

3-02 MAINTENANCE TRAINING

- A. Comply with pertinent provisions of AIA A201 2007 General Conditions, as amended, and Division 01.
- B. Each Contractor, Subcontractor, and/or Factory Representative shall instruct the Owner in the proper care, maintenance and operation of all systems installed under his Contract. Provide a written letter stating that the Owner has been instructed and list the following:
 - 1. Date, time and place of instruction
 - 2. Parties present
 - 3. Systems and items instructions were given on

END OF SECTION

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SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART ONE - GENERAL

1-01 **DESCRIPTION**

- A. Work included:
 - 1. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents, as described in Article 3.1 below.
 - 2. Upon completion of the Work, deliver the recorded changes to the Architect.
 - 3. Final record survey, performed by a Professional Land Surveyor, of installed underground materials and final grades.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, AIA Document A201 and Spec Sections 00 72 13-General Conditions and 00 73 00-Extension of General Conditions, found in Division 00 of these Specifications.
 - 2. Other requirements affecting Project Record Documents may appear in pertinent other Sections of these specifications.

1-02 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Architect.
- B. Accuracy of records:
 - 1. Accuracy of records shall be such that future searches for items shown on the Project Record Documents may rely reasonably on the information provided under this Section of the Work.

1-03 SUBMITTALS

- A. The Architect/ Engineer's approval of the current status of Project Record Documents will be a prerequisite to the approval of requests for progress payment and request for final payment under the Contract.
- B. Prior to submitting each request for progress payment, secure the Architect's Manager's approval of the current status of the Project Record Documents.
- C. Prior to submitting the final request for payment, submit the final Project Record Documents to the Architect and secure his approval.

1-04 PRODUCT HANDLING

- A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer to the Architect.
- B. In the event of loss of recorded data, use means necessary to again secure the data to the Architect's approval.
 - 1. Such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials.
 - 2. In such case, provide replacements to the standards originally required by the Contract Documents.

PART TWO - PRODUCTS

2-01 JOB SET DOCUMENTS

- A. Promptly following receipt of the Owner's Notice to Proceed, secure from the Architect, at no charge to the Contractor:
 - 1. One complete set of all Documents comprising the Contract, including Plans, Specification Manuals, and Shop Drawings Log.
 - 2. Field survey books for use in staking sewer work.

PART THREE - EXECUTION

3-01 MAINTENANCE OF JOB SET

- A. Immediately upon receipt of the job set described in Paragraph 2.1-A above, identify each of the Documents with the title, "RECORD DOCUMENTS JOB SET".
- B. Preservation:
 - 1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the Architect.
 - 2. Do not use the job set for any purpose except entry of new data and for review by the Owner, Architect, and PM.
 - 3. Maintain the job set at the site of Work.
- C. Making entries on Job Set Drawings:
 - 1. Use erasable colored pencil, preferably red (not ink or indelible pencil) to delineate changes.

- 2. Show by station number location of all fittings, manholes, valves, wye locations, etc.
- 3. Reference all valves to above ground items deemed to be reasonably safe from being relocated and indicate such references on the drawings.
- 4. Show location of electrical conduit, pull boxes, etc.
- 5. Show all finish grades.
- 6. Note related Addendum, Change Orders, Supplemental Instructions, Requests for Information on plan sheets where applicable.
- 7. Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual work performed in comparison with the text of the Specifications and modifications.
- 8. Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations.
- D. Submittal Submit the following within thirty (30) days after the Date of Substantial Completion:
 - 1. Submit "marked-up" set of drawings for review by the Architect.
 - 2. Make any necessary additions as required by the Architect.
 - 3. Submit field survey books to the Architect.
 - 4. Submit one complete set of Product Data (Shop Drawing) submittals to the Architect. All submittals are to include approval stamp of the Architect.

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SECTION 01 91 13 - COMMISSIONING

PART 1 - GENERAL

1.1 <u>SUMMARY</u>

A. This Section includes general requirements that apply to implementation of commissioning without regard to systems, subsystems, and equipment being commissioned.

1.2 **DEFINITIONS**

- A. BAS: Building Automation System.
- B. BoD: Basis of Design.
- C. CxA: Commissioning Authority.
- D. OPR: Owner's Project Requirements.
- E. Systems, Subsystems, and Equipment: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, and equipment.
- F. TAB: Testing, Adjusting, and Balancing.

1.3 SYSTEMS TO BE COMMISSIONED

- A. The following systems are to be commissioned for this project:
 - 1. Fire Protection (Division 21)
 - a. Sprinkler system piping, valves, heads and accessories.
 - b. Connections to Fire Alarm System
 - 2. Plumbing (Division 22)
 - a. Domestic water systems, including water heaters, pumps, piping, valves and accessories
 - b. Plumbing fixtures.
 - 3. HVAC (Division 23)
 - a. Variable Refrigerant Flow System
 - b. Energy Recovery Units
 - c. Ductwork, piping, air distribution, insulation and all related accessories
 - d. Fans
 - e. HVAC control system and building automation
 - f. Review general indoor air and indoor environment quality

- g. Terminal Equipment (split system AC units, unit heaters, etc.).
- 4. Electrical (Division 26)
 - a. Lighting control systems.
- 5. Fire Alarm (Division 28)
 - a. Control/annunciator panels, initiating devices, notification appliances.
 - b. Connections to other systems (door release, HVAC, etc.)

1.4 COMMISSIONING TEAM

- A. Members Appointed by Contractor(s): Individuals, each having authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated actions. The commissioning team shall consist of, but not be limited to, representatives of Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the CxA.
- B. Members Appointed by Owner:
 - 1. CxA: The designated person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. Owner will engage the CxA under a separate contract.
 - 2. Representatives of the facility user and operation and maintenance personnel.
 - 3. Architect and engineering design professionals.

1.5 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor and all subcontractors involved with commissioned systems and equipment (e.g. HVAC, Electrical, Plumbing, Fire Protection, Fire Alarm) shall assign representatives with expertise and authority to act on behalf of the Contractor/Subcontractor and schedule them to participate in and perform commissioning team activities including, but not limited to, the following:
 - 1. Work with the CxA to identify schedule requirements for all commissioning activities, and incorporate these activities into the overall project schedule, to ensure all required commissioning scope is properly completed prior to Occupancy.
 - 2. Participate in commissioning meetings.
 - 3. Notify CxA at least seven (7) business days prior to any field testing, pipe flushing, manufacturer or third-party inspections and/or testing, or equipment startup.
 - 4. Certify that Work is complete and systems are operational according to the Contract Documents, including calibration of instrumentation and controls (see form at the end of this section)

- 5. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend and implement corrective action.
- 6. Provide technicians who are familiar with the construction and operation of installed systems and who shall participate in functional performance testing of installed systems, subsystems, and equipment.
- 7. Develop and coordinate an overall training program, including manufacturer training, classroom training, and field demonstration training sessions.
- 8. Provide qualified instructors to perform training sessions for Owner's operation and maintenance personnel.
- 9. Provide personnel to assist or perform seasonal or deferred testing as defined under other sections of the Specifications.
- 10. Provide prompt written responses to all identified issues identified during commissioning, including description of how each issue was or is to be addressed.

B. <u>SCHEDULE COORDINATION</u>

- Building Cleanliness, HVAC Start-Ups, Controls, TAB, and Cx Functional Testing: Contractor shall be responsible for providing an overall project schedule that provides the necessary time frames to complete Cx Functional Performance Testing prior to owner turnover/occupancy. Cx Functional Testing shall not begin until after all building / HVAC control systems are 100% complete and all field TAB work is 100% complete. Schedule shall be finalized with the understanding that completion of all HVAC controls and TAB work hinges upon the general building construction and cleanliness that will allow equipment to be operated continuously, on a daily basis.
- 2. AHU Start-Ups: Building must be relatively clean before starting up any AHU systems no ongoing work that produces visible quantities of airborne dust. Units shall not be operated in any capacity until all drywall/sanding and floor grinding work is 100% complete. If field activities are observed that continue to generate dirt/dust after AHU start-ups, contractor shall be responsible for cleaning of ductwork and unit interiors.
- 3. Phased Equipment Start-Up: HVAC supply/ventilation air as well as building exhaust are both served by large, central systems that feed the entire building. Project does not allow for "phased" equipment start-ups where one floor at a time is "brought online". Entire building must be free of dust-producing activities before operating any central HVAC Equipment. This needs to be taken into account in the overall project schedule.
- 4. Temporary Conditioning: Contractor shall provide a plan for temporary heating/cooling if building conditioning is required but AHUs or building systems are not ready to operate, of if general building conditions/cleanliness does not allow for AHU operation.
- 5. AHUs During Construction: If the contractor requests that HVAC equipment be operational in order to prevent delays in project schedule,

the GC shall request that the commissioning agent, design team, and owner inspect the status of ductwork and AHU cleanliness and grant permission to operate equipment. Contractor shall submit a written letter to accept responsibility for any duct/equipment cleaning that is required due to continued construction activity that continues to generate dust.

HVAC contractor shall maintain temporary filter media to help keep ductwork, equipment, and coils clean, but use of filter media is not an acceptable "solution" to allow HVAC equipment to operate if general construction work continues to generate dirt and dust on a regular basis.

- 6. Start-Up Plan: As part of the submittal process, contractor shall submit a coordinated HVAC equipment / system start-up plan with input from the HVAC contractor, and controls contractor to outline all expectations for equipment start-up including, but not limited to, description of building cleanliness and overall interior construction status as a pre-cursor to start ups, order of start-up activities (by system and by area), what level of controls and equipment safeties shall be in place at time of start-ups, required locations of filter media on HVAC grilles and diffusers, filter media maintenance plan during construction, use of temporary smoke detectors to allow 24/7 AHU operation if required, and protocol for shutting down units as required based on construction activity.
- 7. AHU Operation OA vs RA/Exhaust Air: HVAC start-up plan as well as completion schedule shall include specific differentiation between operating AHUs at 100% outdoor air versus allowing AHUs to pull return air or exhaust air from the space. Buildings are often not clean enough to pull return air at the time that contractors wish to start operating AHUs. For any time period that units are to operate at 100% outdoor air, Exhaust Air duct openings and grilles shall remain fully covered in plastic until the owner, design team, and Cx agent agree that the building is clean enough to pull exhaust air air. For time period of 100% OA operation, contractor(s) shall consider necessary precautions for freeze protection and proper temp/humidity control associated with 100% OA.
- 8. Fire/Smoke Dampers & AHU Start-Up: Contractor HVAC start-up plan shall include intended approach to ensure that fire/smoke dampers are open throughout the building at time of AHU start-ups. Fire/smoke dampers are powered open through the fire alarm panel and the FACP may not be active/complete at the time of AHU start-ups. Outline provisions to provide temporary power to open all fire/smoke dampers before start-ups. Acceptable means of opening dampers to allow AHU start-ups shall NOT include disconnecting damper linkages to manually open the fire/smoke dampers.
- 9. Schedule AHU Operation: Contractor's initial schedule shall be required to include a date that the building will be clean enough to operate AHUs on a daily basis, to allow uninterrupted work on these systems by both controls and TAB contractor. This date shall be directly linked to the final project turnover date, with the understanding that failure to achieve this date will push back the turnover date. Contractor shall determine

what month of the year that AHUs will be required to operate on a daily basis to meet project schedule and plan in advance for whether or not Heating Hot Water or Chilled Water systems (or both) will need to be functional before operating AHUs.

- Substantial Completion FOR CX: "Substantial Completion for Cx" shall be defined as follows: All BAS, Controls, Fire Alarm, and Test & Balance work 100% complete for all primary systems & equipment – AHUs, HHW System, Terminal Units, and Exhaust Fans.
- 11. For the BAS this shall include all programming, sequences, BAS graphics & floor plans, alarm set up, BAS trend points set up, occupancy schedules in place, and all set points finalized.
- 12. For Test & Balance this shall mean that all field TAB work is complete, AHUs have been finalized, all devices calibrated, exhaust systems complete, +/- pressurization rooms verified, and draft TAB report has been turned over to System WorCx
- 13. For Electrical, this means that all fire alarm testing is 100% complete. Fire/Smoke dampers are operational, AHU shut-downs in place, and under control of FACP.
- 14. Schedule Cx Testing: Cx testing shall begin upon contractor(s) meeting all requirements for "Substantial Completion for Cx". For this specific project, the schedule shall provide six (6) weeks between Substantial Completion for Cx and turnover of the building to the owner for occupancy. This will provide time for all Cx Functional testing as well as resolution of issues and re-testing of systems as necessary – including smoke control systems.
- 15. Building Automation System, Building Pressurization, Occupancy Sensors, and Unoccupied Mode: Within the six (6) week Cx functional testing window, contractor shall also ensure two (2) weeks of time that the building is accessible solely to CxA or subcontractors specifically requested by CxA to assist in functional testing. Portions of Cx testing referenced above become entirely compromised if any other parties are performing work in ANY areas of the building. This (2) week window shall be provided in the middle of the larger 6-week testing window.
- 16. BAS & Building Network: Construction schedule and Substantial Completion for Cx shall be coordinated with building network to ensure that the BAS is fully integrated to the existing network and server at the start of Cx Functional Testing.
- 17. Schedule Ties: Contractor schedule shall include ties between building clean, HVAC start-ups, controls completion, Test & Balance work, Substantial Completion for Cx, and building turnover to clearly outline that failure to meet any one of those dates has a direct impact on ability to achieve the final turnover date. Note that systems must be up and running on a daily basis for the BAS contractor to get them under control and perform internal checkouts. Systems must be under control before TAB can begin work on each system. TAB work must be complete prior to

Cx functional testing. There schedule overlap between these three activities is very minimal.

- 18. Schedule & Change Orders: Contractor shall be responsible to evaluate the effect that any change order may have on the individual schedule milestones for building cleanliness, HVAC, Controls, TAB or Cx. If a change order is believed to impact any of these dates, owner shall be made aware and the building turnover date shall be adjusted accordingly. (Unless contractor coordinates with all trades to determine an agreed upon approach for overtime work to make up schedule days). At no point shall the contractor attempt to shorten the duration or number of days provided to complete BAS/Controls, TAB, or Cx Testing as a means of recovering schedule days.
- 19. TAB Start Requirements: Contractor schedule start date for TAB activities shall be appropriately linked to HVAC, Start-Up, and Controls schedule dates to ensure that entire systems are ready to TAB work to commence.
- 20. Air Side TAB: Shall not begin until corresponding AHU is under proper static pressure control, all spaces are free dirt/dust, all connected VAV boxes have been energized and are under control, all ceiling grid and diffusers are in place.
- 21. TAB Support / Coordination: For any areas of the building that require a lift to access ductwork or volume dampers for TAB work, contractor shall provide and coordinate lift for use by TAB contractor.

1.6 CxA'S RESPONSIBILITIES (FOR CONTRACTOR INFORMATION ONLY)

- A. Organize and lead the commissioning team.
- B. Prepare a construction-phase commissioning plan. Collaborate with commissioning team to develop test and inspection procedures. Include design changes and scheduled commissioning activities coordinated with overall Project schedule. Identify commissioning team member responsibilities, by name, firm, and trade specialty, for performance of each commissioning task.
- C. Review and comment on submittals from Contractor for compliance with the OPR, BoD, Contract Documents, and construction-phase commissioning plan. Review and comment on performance expectations of systems and equipment and interfaces between systems relating to the OPR and BoD.
- D. Convene commissioning team meetings for the purpose of coordination, communication, and conflict resolution; discuss progress of the commissioning processes. Responsibilities include arranging for facilities, preparing agenda and attendance lists, and notifying participants. The CxA shall prepare and distribute minutes to commissioning team members and attendees within five workdays of the commissioning meeting.

- E. At the beginning of the construction phase, conduct an initial constructionphase coordination meeting for the purpose of reviewing the commissioning activities and establishing tentative schedules for operation and maintenance submittals; operation and maintenance training sessions; TAB Work; and Project completion.
- F. Observe construction and report progress and deficiencies. Observe systems and equipment installation for consistency with contract documents and required national standards, implementation of IAQ management practices, adequate accessibility for maintenance and component replacement or repair.
- G. Prepare Project-specific construction checklists for each piece of equipment and component associated with commissioned systems.
- H. Field-verify proper installation of all commissioned systems.
- I. Prepare Project-specific functional performance test procedures to verify system performance, interoperability, and sequences of operation.
- J. Direct, witness, and document functional performance tests, with systems and equipment operated by the Contractor.
- K. Compile test results and baseline data and include them in the systems manual and commissioning report.
- L. Review Project Record Documents for general adequacy and accuracy. Request revisions from Contractor to achieve accuracy. Project Record Documents requirements are specified in Division 1 Section "Project Record Documents."
- M. Review and comment on operation and maintenance documentation for compliance with the OPR, BoD, and Contract Documents. Operation and maintenance documentation requirements are specified in Division 1 Section "Operation and Maintenance Data."
- N. Review operation and maintenance training program proposed by Contractor and ensure training program is sufficient and qualified instructors are provided by the Contractor to conduct operation and maintenance training. Operation and maintenance training is specified in Division 1 Section "Demonstration and Training."
- O. Prepare commissioning reports.
- P. Assemble the final commissioning documentation, including the commissioning report and Project Record Documents.

1.7 COMMISSIONING DOCUMENTATION

- A. OPR: A written document, prepared by Owner that details the functional requirements of Project and expectations of how it will be used and operated. This document includes Project and design goals, measurable performance criteria, budgets, schedules, success criteria, and supporting information.
- B. BoD Document: A document, prepared by Architect/Engineer, that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- C. Commissioning Plan: A document, prepared by CxA, that outlines the process, organization, reporting, and documentation requirements of the commissioning process, and shall include, but is not limited to the following:
 - 1. Identification of commissioning team members, and their roles and responsibilities.
 - 2. Plan for delivery and review of submittals, systems manuals, and other documents and reports. Identification of the relationship of these documents to other functions and a detailed description of submittals that are required to support the commissioning processes.
 - 3. Description of the organization, layout, and content of commissioning documentation (including systems manual) and a detailed description of documents to be provided along with identification of responsible parties.
 - 4. Identification of systems and equipment to be commissioned.
 - 5. Description of testing procedures along with identification of parties involved in performing and verifying tests.
 - 6. Identification of items that must be completed before the next operation can proceed.
 - 7. Description of responsibilities of commissioning team members.
 - 8. Description of observations to be made.
 - 9. Description of requirements for operation and maintenance training, including required training materials.
 - 10. Process for completing prestart and startup checklists for systems, subsystems, and equipment to be verified and tested.
 - 11. Process for testing systems, subsystems, and equipment with descriptions for methods of verifying relevant data, recording the results obtained, and listing parties involved in performing and verifying tests.
- D. Construction Checklists: CxA will provide checklists for major pieces of equipment for the Contractor to reference as guidelines for field-reviews by the CxA. The Contractor does not have to complete or submit these checklists.
- E. Functional Performance Test Procedures: CxA shall develop functional performance test procedures for each system, subsystem, or equipment including interfaces and interlocks, and include a separate entry, with space for

comments, for each item to be tested. Provide space for testing personnel to sign off on each checklist. Each test procedure shall include, but not be limited to, the following:

- 1. Name and identification code of tested item.
- 2. Time and date of test.
- 3. Indication of whether the record is for a first test or retest following correction of a problem or issue.
- 4. Individuals present for test.
- 5. Calibration of sensors and sensor function.
- 6. Testing conditions under which test was conducted, including (as applicable) ambient conditions, set points, override conditions, and status and operating conditions that impact the results of test.
- 7. Control sequences.
- 8. Responses to control signals at specified conditions.
- 9. Sequence of response(s) to control signals at specified conditions.
- 10. Expected performance of systems, subsystems, and equipment at each step of test.
- 11. Narrative description of observed performance of systems, subsystems, and equipment. Notation to indicate whether the observed performance at each step meets the expected results.
- 12. Interaction of auxiliary equipment and interfaces with other systems.
- 13. Setpoints.
- 14. Deficiencies.
- F. Certificate of Readiness: Certificate of Readiness shall be signed by Contractor, Subcontractor(s), Installer(s), and CxA certifying that systems, subsystems, equipment, and associated controls are ready for testing (see form at the end of this section).
- G. Test Reports: CxA shall record test data, observations, and measurements on test procedures and test logs. Photographs, forms, and other means appropriate for the application shall be included with data. CxA shall compile test reports and include them in systems manual and commissioning report.
- H. Corrective Action Documents: CxA shall document corrective action taken for systems and equipment that fail tests. Include required modifications to systems and equipment and revisions to test procedures, if any. Retest systems and equipment requiring corrective action and document retest results.
- I. Issues Log: CxA shall prepare and maintain an issues log that describes design, installation, and performance issues that are at variance with the OPR, BoD, and Contract Documents. Identify and track issues as they are encountered, documenting the status of unresolved and resolved issues.
- J. Commissioning Report: CxA shall document results of the commissioning process including unresolved issues and performance of systems, subsystems, and equipment. The commissioning report shall indicate whether systems,

subsystems, and equipment have been completed and are performing according to the OPR, BoD, and Contract Documents. The commissioning report shall include, but is not limited to, the following:

- 1. OPR and BoD documentation.
- 2. Commissioning plan.
- 3. Testing plans and reports.
- 4. Issues log.
- 5. Completed test checklists.
- 6. Listing of off-season test(s) not performed and a schedule for their completion.

1.8 <u>SUBMITTALS</u>

- A. The contractor shall provide one copy of each submittal for equipment related to commissioned equipment to the CxA at the time it is submitted to the Architect. The Contractor shall include all information necessary to prepare startup checklists and functional performance test procedures, including performance data, sequences of operation, and manufacturer's startup checklists.
- B. The CxA will forward any submittal comments to the Architect prior to the submittals being returned to the Contractor. The CxA may request additional submittal information from the Contractor needed to complete the commissioning process. The Contractor shall gather the requested information and resubmit it to the CxA.
- C. Commissioning Plan: CxA shall submit two hard copies and two sets of electronically formatted information of the commissioning plan. Deliver one hard copy and one set of discs to Owner, and one copy to Architect.
- D. Construction Checklists and Functional Performance Test Procedures: CxA shall submit sample checklists and forms to Contractor quality-control manager and subcontractors for review and comment. Submit two copies of each checklist and report form.
- E. Contractor shall submit results and reports from all manufacturer startup or special field-testing services within seven days of completion.
- F. Completed Construction Checklists: Contractor shall submit completed and signed construction checklists to the CxA for review.
- G. Certificates of Readiness: Contractor shall submit Certificates of Readiness (see form at the end of this section).

1.9 COORDINATION

- A. Coordination drawings: Contractor shall prepare coordination drawings showing coordination between trades for all above-ceiling areas, sleeves, and mechanical and electrical equipment rooms. Contractor shall conduct a review meeting with the commissioning team of the coordination drawings prior to commencing any rough-in of commissioned systems, and any comments by the commissioning team shall be addressed and incorporated in the coordination drawings prior to rough-in.
- B. Reporting: CxA shall distribute commissioning field reports, periodically updated issues logs, test results, and other documents generated by the CxA to the commissioning team. All information will be copied to the Owner's representatives. The Contractor shall respond to all items noted in each commissioning field report within seven (7) days. The response shall note the intended action or response by the Contractor, and indicate a date for correction or resolution of the issue.
- C. Scheduling: The Contractor shall incorporate key commissioning activities and milestones into the overall construction schedule to ensure that commissioning can be successfully completed prior to Substantial Completion. The CxA will provide input to the Contractor as to activity durations, sequences, and logic ties, and other activities required to completed as prerequisites to commissioning process activities.
- D. Commissioning Meetings: CxA shall conduct periodic commissioning meetings of the commissioning team to review the issues log, progress on the commissioning plan, to discuss scheduling conflicts, and to discuss upcoming commissioning process activities.
- E. Testing Coordination: Contractor shall coordinate sequence of testing 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, and to ensure all testing activities can be completed prior to Occupancy, including allowance for time to correct any deficiencies.
- F. Field Testing: Contractor shall coordinate all specified field testing and other quality assurance activities, shall incorporate them into the overall project schedule, and shall notify CxA prior to implementing tests and activities. Contractor shall give CxA at least seven days notice prior to any testing or startup services by manufacturers, as related to the following equipment:
 - 1. Building Envelope
 - a. Waterproofing
 - b. Building Enclosure Air Leakage Testing
 - c. Insulation Testing
 - d. Roofing Testing
- e. Curtainwall Testing
- 2. Air Handling Units
- 3. Lighting control devices
- 4. Domestic water pumps and hot water heaters
- 5. Fire Alarm System
- G. Coordination among subcontractors: Contractor shall maintain a master file of construction checklists, startup reports, manufacturer field tests, and other related information. The General Contractor shall be responsible for distributing construction checklists to all necessary subcontractors. The General Contractor shall ensure proper completion of each checklist by each subcontractor, collect completed checklists, and notify the CxA upon completion by all involved subs for each checklist.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 BASIC COMMISSIONING PROCESS

- A. The following outlines the basic process of commissioning.
 - 1. Commissioning during construction begins with a scoping meeting conducted by the CxA where the commissioning process is reviewed with the commissioning team members.
 - 2. Additional meetings will be required throughout construction, scheduled by the CxA with necessary parties attending, to plan, scope, coordinate, schedule future activities and resolve problems.
 - 3. CxA maintains and distributes a Master Issues Log to track all deficiencies through to resolution.
 - 4. Equipment documentation is submitted to the CxA during normal submittals, including detailed start-up procedures.
 - 5. The CxA works with the Contractor in developing startup plans and startup documentation formats, including providing the Contractor with construction checklists to be used as guidance during the installation and startup process.
 - 6. In general, the checkout and performance verification proceeds from simple to complex; from component level to equipment to systems and intersystem levels with construction checklists being completed before functional testing, and functional testing completed before integrated system testing.
 - 7. The Contractor and Subcontractors, under their own direction, execute and document startup and initial checkout. The Contractor notifies the CxA in advance of all activities. The CxA documents that the startups were completed according to the approved plans. This may include the CxA witnessing start-up of selected equipment.

- 8. The Contractor and Subcontractors, under their own direction, execute and document all testing required by the Specifications, such as load bank testing, electrical testing, air barrier testing, etc. The Contractor notifies the CxA in advance of all activities. The CxA documents that the startups were completed according to the approved plans. This may include the CxA witnessing start-up of selected equipment.
- 9. The CxA develops specific equipment and system functional performance test procedures. The Contractor reviews the procedures.
- 10. The functional test procedures are executed by the Contractor, under the direction of, and documented by the CxA.
- 11. Items of non-compliance in material, installation or setup are corrected at the Contractor's expense and the system retested.
- 12. The Contractor provides and installs load banks in preparation for the Integrated System Testing.
- 13. The CxA reviews the O&M documentation for completeness.
- 14. Commissioning is completed before Substantial Completion.
- 15. The CxA reviews, pre-approves and coordinates the training provided by the Contractor and verifies that it was completed.
- 16. Deferred and seasonal testing is conducted by the Contractor, as specified or required, under the direction of the CxA. The CxA coordinates the scheduling through the Contractor.
- 17. The CxA performs post-occupancy evaluations after approximately two months and ten months of occupancy to identify any issues or deficiencies. Deficiencies shall be addressed by the Contractor prior to expiration of any warranties.

3.2 BUILDING ENVELOPE COMMISSIONING

- CxA will periodically be on site during the installation of the roofing membrane, waterproofing membrane, air barrier system, curtainwall, and exterior sealant. Number of inspections will vary due to work days for each trade and overlapping scope of work by the trades.
- 2. CxA will review product submittals and shop drawings for each trade involved in the exterior wall and roof assemblies.
- 3. CxA will attend pre-construction meetings for roofing and wall assemblies.
- 4. CxA will attend final punchlist inspections for roofing and walls. One backpunch inspection is assumed for each.

3.3 TESTING PREPARATION

- A. The Mechanical Subcontractor shall complete the following prerequisites for Testing:
 - 1. Certify that HVAC systems, subsystems, and equipment have been completed, calibrated, and started; are operating according to the Contract Documents and approved Submittals; and that Certificates of Readiness are signed and submitted (attached to the end of this section).

- 2. Submit results and reports from all manufacturer startup or special field-testing services within seven days of completion.
- 3. Pipe cleaning, flushing, hydrostatic tests, and chemical treatment requirements are specified in Division 23. HVAC subcontractor shall prepare pipe system cleaning, flushing, and hydrostatic testing. CxA shall review and comment on plan and final reports. Plan shall include the following:
 - a. Sequence of testing and testing procedures for each section of pipe to be tested, identified by pipe zone or sector identification marker. Markers shall be keyed Drawings for each pipe sector showing the physical location of each designated pipe test section. Drawings keyed to pipe zones or sectors shall be formatted to allow each section of piping to be physically located and identified when referred to in pipe system cleaning, flushing, hydrostatic testing, and chemical treatment plan.
 - b. Description of equipment for flushing operations.
 - c. Minimum flushing water velocity.
 - d. Tracking checklist for managing and ensuring that all pipe sections have been cleaned, flushed, hydrostatically tested, and chemically treated.
- 4. Certify that HVAC instrumentation and control systems have been completed and calibrated; are operating according to Contract Documents; and that pretest set points have been recorded.
- 5. Certify that TAB procedures have been completed, and that TAB reports have been submitted, discrepancies corrected, and corrective work approved.
- 6. Perform preliminary check of systems and intersystem performance.
- 7. Set systems, subsystems, and equipment into operating mode to be tested (e.g., normal shut down, normal auto position, normal manual position, unoccupied cycle, emergency power, and alarm conditions).
- 8. Verify each operating cycle after it has been running for a specified period and is operating in a steady-state condition.
- 9. Observe and verify the position of each device and interlock identified on checklists. Sign off each item as acceptable, or failed. Repeat this test for each operating cycle that applies to system being tested.
- 10. Check safety cutouts, alarms, and interlocks with smoke control and lifesafety systems during each mode of operation.
- 11. Annotate checklist or data sheet when a deficiency is observed.
- 12. Verify equipment interface with monitoring and control system and TAB criteria; include the following:
 - a. Supply and return flow rates for VAV and constant volume systems in each operational mode.
 - b. Operation of terminal units in both heating and cooling cycles.

- c. Minimum outdoor-air intake in each operational mode and at minimum and maximum airflows.
- d. Building pressurization and laboratory room pressurization.
- e. Total exhaust airflow and total outdoor-air intake.
- f. Operation of indoor-air-quality monitoring systems.
- 13. Verify proper responses of monitoring and control system controllers and sensors to include the following:
 - a. For each controller or sensor, record the indicated monitoring and control system reading and the test instrument reading. If initial test indicates that the test reading is outside of the control range of the installed device, check calibration of the installed device and adjust as required. Retest malfunctioning devices and record results on checklist or data sheet.
 - b. Report deficiencies and prepare an issues log entry.
- B. The Electrical Subcontractor shall complete the following prerequisites for Testing:
 - 1. Certify that electrical systems, subsystems, and equipment have been completed, calibrated, and started; are operating according to the Contract Documents and approved Submittals; and that Certificates of Readiness are signed and submitted (attached to the end of this section).
 - 2. Submit results and reports from all manufacturer startup, load testing or special field-testing services within seven days of completion.
 - 3. Certify that electrical instrumentation and control systems have been completed and calibrated; are operating according to Contract Documents; and that pretest set points have been recorded.
 - 4. Perform preliminary check of systems and intersystem performance.
 - 5. Perform all required functional testing required by other specifications sections, such as load bank testing, cable testing, NETA testing, etc.
- C. If deficiencies are identified during verification testing, CxA shall notify the HVAC/Electrical subcontractor and Architect, and shall take action to remedy the deficiency. Architect shall review final tabulated checklists and data sheets to determine if verification is complete and that system is operating according to the Contract Documents.
- D. Set all adjustable breakers according to approved Coordination Study.
- E. CxA shall verify that TAB Work has been successfully completed.

3.4 Test and Balance (TAB) VERIFICATION

- A. TAB subcontractor shall coordinate with CxA for work required in Division 23 Section "Testing, Adjusting, and Balancing." TAB subcontractor shall copy CxA with required reports, sample forms, checklists, and certificates.
- B. Contractor, HVAC subcontractor, and CxA shall witness TAB Work.
- C. TAB Preparation:
 - 1. TAB subcontractor shall provide CxA with data required for "Pre-Field TAB Engineering Reports" specified in Division 23 Section "Testing, Adjusting, and Balancing."
 - a. CxA shall use this data to certify that prestart and startup activities have been completed for systems, subsystems, and equipment installation.
- D. Verification of Final TAB Report:
 - 1. CxA shall select, at random, 10 percent of report for field verification.
 - 2. CxA shall notify TAB subcontractor ten days in advance of the date of field verification; however, notice shall not include data points to be verified. The TAB subcontractor shall provide a technician to verify field readings, by using the same instruments (by model and serial number) that were used when original data were collected.
 - 3. Failure of an item is defined as follows:
 - a. For all readings other than sound, a deviation of more than 10 percent.
 - 4. Failure of more than 10 percent of selected items shall result in rejection of final TAB report.
- E. If deficiencies are identified during verification testing, CxA shall notify the HVAC subcontractor and Architect, and shall take action to remedy the deficiency. Architect shall review final tabulated checklists and data sheets to determine if verification is complete and that system is operating according to the Contract Documents.
- F. CxA shall verify that TAB Work has been successfully completed.

3.5 <u>TESTING</u>

- A. Functional Performance Tests of systems and intersystem performance shall be completed after construction checklists for systems, subsystems, and equipment have been approved.
- B. Functional Performance Testing will be done under the direction of the CxA. The responsible subcontractors and vendor representatives shall operate and manipulate equipment and controls as directed.

- C. Scope of HVAC System Testing:
 - 1. Testing scope shall include entire HVAC installation, from central equipment for heating and cooling through distribution systems to each conditioned space. It shall include measuring capacities and effectiveness of operational and control functions.
 - 2. Verify calibration of all sensors (temperature, pressure, humidity, etc.).
 - 3. Verify operation of all devices (valves, dampers, etc.).
 - 4. Verify correct communication and data point mapping between equipment controls (e.g. chillers) and BAS.
 - 5. Verify correct communication with remote facilities.
 - 6. Test all operating modes, interlocks, control responses, responses to abnormal or emergency conditions, and verify proper response of building automation system controllers and sensors.
 - 7. Verify proper responses to component failures for each component (e.g. pumps, air handling units, chillers, control panels, sensors, etc.).
 - 8. Verify functionality of HVAC systems during integrated systems testing, including ability to maintain space temperature and humidity within limits under design load.
 - 9. Initiate and retrieve trend data for all data points, for first four weeks following successful testing.
- D. Scope of Plumbing System Testing:
 - 1. Testing scope shall include central equipment for water heating through distribution systems to each fixture. It shall include measuring capacities and effectiveness of operational and control functions.
 - 2. Test all operating modes, interlocks, control responses, responses to abnormal or emergency conditions, and verify proper response of system controllers and sensors.
 - 3. Verify interfaces with the Building Automation System are correct and operational.
 - 4. Test all plumbing fixtures for proper operation.
- E. Scope of Electrical Testing:
 - 1. Test for proper control of interior and exterior lighting controls via switches, occupancy sensors, daylight sensors, photocells, or other controls.
- F. Scope of Fire Alarm and Fire Protection Systems
 - 1. Verify functionality of all alarms and interlocks.
 - 2. Participate in and witness Fire Marshall testing of fire alarm and fire protection systems.
- G. Integrated System Testing:
 - 1. Testing scope shall include the interactions between systems, such as the HVAC systems' ability to maintain a positively pressurized building envelope, system restore capability on loss of normal power and transfer to backup power, fire alarm conditions, etc.

- 2. Testing to be done after testing of individual systems.
- H. Detailed Testing Procedures: CxA, with commissioning team, shall prepare detailed testing plans, procedures, and checklists for all commissioned systems, subsystems, and equipment.
- I. Deferred Testing:
 - 1. If tests cannot be completed because of a deficiency outside the scope of the system, the deficiency shall be documented and reported to Owner. Deficiencies shall be resolved and corrected by appropriate parties and test rescheduled.
 - 2. Initial testing shall be performed with simulated loads where necessary, based on seasonal conditions. Contractor shall provide personnel to assist CxA with completion of testing after occupancy, when seasonal conditions permit actual performance under summer and winter design conditions.
- J. Seasonal Testing:
 - 1. The season during which the initial functional performance testing for the systems is conducted will be defined as either cooling season, heating season, or shoulder season. Contractor shall provide all necessary support to reperform testing to verify performance during the warranty phase of the project when weather conditions are consistent with the other two seasons.
- K. Testing Reports:
 - 1. Reports shall include measured data, data sheets, and a comprehensive summary describing the operation of systems at the time of testing.
 - 2. Include data sheets for each controller to verify proper operation of the control system, the system it serves, the service it provides, and its location. For each controller, provide space for recording its readout, the reading at the controller's sensor(s), plus comments. Provide space for testing personnel to sign off on each data sheet.
 - 3. Prepare a preliminary test report. Deficiencies will be evaluated by Architect to determine corrective action. Deficiencies shall be corrected and test repeated.
 - 4. If it is determined that the system is constructed according to the Contract Documents, Owner will decide whether modifications required to bring the performance of the system to the OPR and BoD documents shall be implemented or if tests will be accepted as submitted. If corrective Work is performed, Owner will decide if tests shall be repeated and a revised report submitted.

3.6 **OPERATION AND MAINTENANCE TRAINING REQUIREMENTS**

- A. Training Preparation Conference: Before operation and maintenance training, CxA shall convene a training preparation conference to include Owner's operation and maintenance personnel, Contractor, and subcontractors. In addition to requirements specified in Division 1 Section "Demonstration and Training," perform the following:
 - 1. Review the OPR and BoD.
 - 2. Review installed systems, subsystems, and equipment.
 - 3. Review instructor qualifications.
 - 4. Review instructional methods and procedures.
 - 5. Review training module outlines and contents.
 - 6. Review course materials (including operation and maintenance manuals).
 - 7. Inspect and discuss locations and other facilities required for instruction.
 - 8. Review and finalize training schedule and verify availability of educational materials, instructors, audiovisual equipment, and facilities needed to avoid delays.
 - 9. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.
- B. Training Modules: The commissioning team shall jointly develop an instruction program that includes individual training modules for each system, subsystem, and equipment.

(Certificate of Readiness to follow)

CERTIFICATE OF READINESS

Contractor has verified that the following prerequisite items have been completed in preparation for the functional testing phase of the commissioning process.

System to Be Commissioned:

The system to be commissioned, including all equipment, ductwork, piping, electrical, plumbing, and interfaces to other systems is complete, installed per the Contract Documents, and any issues previously identified by the Commissioning Team have been addressed.

All equipment has been properly started up by qualified personnel. Where specified, the startup was conducted by the manufacturer. Startup procedures and reports have been documented and provided to the CxA.

For HVAC systems, all duct pressure testing, duct cleaning, pipe pressure testing, and pipe flushing has been completed according to the Contract Documents.

For HVAC systems, the Test and Balance work is complete, all issues have been corrected, and a final (draft) report has been provided to the CxA.

For Building Automation system (BAS), the BAS contractor has completed their own checkout procedures, including but not limited to the following:

- Calibration of all sensors.
- Point-to-Point checks of all sensors and devices.
- Checks of all devices (dampers, control valves, etc.) for proper operation, fail position, and verification of no leakage.
- Programming of all sequences of operations, alarms, and setpoints.
- Completion and check of all graphics.
- Interface with other systems (lighting, plumbing, metering, etc.).

All equipment and systems are online and operating with no restrictions for testing.

All necessary notifications, coordination and scheduling have been considered that might be required for functional testing of this system (e.g. Owner, Fire Marshall, Occupants, etc.).

Attach a list any known exceptions or outstanding issues related to the above statements.

List name, title, company, date:

I have verified that the above statements are true and that the system is ready for functional testing by the CxA, except for those items noted as attached. I understand that if it is found that the system has not been properly prepared as per the above, necessitating one or more return site visits by the CxA, the Construction Team may be charged by the Owner for the CxA's additional time, including travel time plus travel expenses.

Signature: _____

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

- A. Furnish and install all materials, labor and equipment necessary to properly perform all concrete work required as specified herein and/or shown on the drawings. To include all concrete, metal reinforcing and finishes.
 - Related Items of Work: Particular attention is directed to the drawings and other construction documents, and to the contract documents, for information pertaining to required items of work which are related to and usually associated with the work of this section of the Project Specifications, but which are to be provided as part of the work of other sections of the Project Specifications.
- **1.3** <u>**CODES AND STANDARDS:**</u> Comply with the provisions of the following codes, specifications, and standards, except as otherwise shown or specified: As listed in the State Building Code. If not listed use Latest Editions
 - A. ACI 301 "Specifications for Structural Concrete for Buildings."
 - B. ACI 311 "Recommended Practice for Concrete Inspection."
 - C. ACI 318 "Building Code Requirements for Reinforced Concrete."
 - D. ACI 347 "Recommended Practice for Concrete Formwork."
 - E. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete."
 - F. Concrete Reinforcing Steel Institute, "Manual of Standard Practice."

1.4 WORKMANSHIP

A. The Contractor is responsible for correction of concrete work which does not conform to the specified requirements, including strength, tolerances and finishes. Correct deficient concrete as directed by the Architect.

1.5 <u>SUBMITTALS</u>

A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, joint systems, curing compounds, and others as requested by Architect.

- B. Green Globe Submittals:
 - 1. Product Data: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating costs for each product having recycled content.
 - 2. Design Mixtures: For each concrete mixture containing fly ash as a replacement for portland cement or other portland cement replacements, and for equivalent concrete mixtures that do not contain portland cement replacements.
- C. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- D. Indicate amounts of mixing water to be withheld for later addition at Project site.
- E. Shop Drawings; Reinforcement: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- F. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design test.
- G. Materials Certificates: Provide certification from admixture manufacturers that chloride content complies with specification requirements.
- H. Shop Drawings for Formwork Indicating Fabrication and Erection of Forms for Specific Finished Concrete Surfaces: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork. Show form construction including jointing, special form joints or reveals, location and pattern of form tie placement, and other items that affect exposed concrete visually.
- I. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.
- J. Architects review is for general architectural applications and features only. Designing formwork for structural stability and efficiency is Contractors responsibility.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for

production facilities and equipment. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

- C. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."
- D. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

Contractor's superintendent. Independent testing agency responsible for concrete design mixtures. Ready-mix concrete manufacturer. Concrete subcontractor.

- F. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.
- G. Vapor Barrier: The vapor barrier shall be installed per ASTM E1745-11, and/or CMHC Best Practice Guide, and/or Building Science.com Best Practices; and

American Concrete Institute 302.2R-06: Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

H. Slab on Grade Position: Position the slab on grade directly over the vapor barrier and capillary-break base course.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete:
 - 1. Unless otherwise shown or specified, construct all formwork for exposed concrete surfaces with plywood, or other acceptable and approved panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

- 2. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood," Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible trademark of an approved inspection agency.
- B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces requiring bond or adhesion, nor impede wetting of surfaces to be cured with water or curing compound.
- D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units which will leave no metal closer than 1-1/2" to surface.
 - 1. Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface.

2.2 REINFORCING MATERIALS

- A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 60 percent.
- B. Reinforcing Steel Bars: ASTM A-615; Grade 60, deformed.
- C. Steel Wire: ASTM A-82, plain, cold-drawn steel.
- D. Welded Wire Fabric: ASTM A-185, welded steel wire fabric.
- E. Supports for Reinforcement:
 - 1. Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening bars and welded wire fabric in place. Use wire bar type supports complying with CRSI recommendations, unless otherwise specified. Wood, brick and other devices will not be acceptable.
 - 2. For slabs on grade, use supports with sand plates, horizontal runners, or concrete brick as approved by Architect where wetted base materials will not support chair legs. Do not use concrete brick if not acceptable to local building official.
 - 3. For exposed to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are hot-dip galvanized, or plastic protected, or stainless steel protected.

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C-150, type 1, unless otherwise acceptable to Architect.

- B. Fly Ash: ASTM C-618, Type F or C.
- C. Aggregates:
 - 1. Fine and coarse aggregate: Conform to ASTM Designation C-33. Provide coarse aggregate to conform to the following size limitations.
 - 2. Nominal maximum size of coarse aggregate shall not be larger than 1/5 of narrowest dimensions between sides of forms, 1/3 of depth of slabs, nor 3/4 of minimum clear distance between reinforcing bars or between bars and forms, whichever is least.
 - 3. Coarse aggregates may be of one size for all concrete placed in one day when quantities to be placed are too small to permit economical use of more than one mix design. When a single mix design is so used, maximum nominal size shall be as required for most critical condition of concreting in accordance with paragraph above.
- D. Water: Clean, fresh, drinkable.
- E. Air-Entraining Admixture: ASTM C-260.
- F. Water-Reducing Admixture: ASTM C-494, Type A.
- G. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C-494, Type F or Type G.
- H. Set-Control Admixtures: ASTM C-494, as follows:
 - 1. Type B, Retarding.
 - 2. Type C, Accelerating.
 - 3. Type D, Water-reducing and Retarding.
 - 4. Type E, Water-reducing and Accelerating.
- I. Calcium chloride will not be permitted in concrete.
- J. Shrinkage Reducing Admixture: For all slab concrete, this project, (except concrete with air-entraining admixtures and foundations) use Eclipse Floor Shrinkage Reducing Admixture by Grace Construction Products. Apply at a dosage of one gallon per cubic yard of concrete as recommended by manufacturer's printed instructions. Do not use with air-entraining admixtures.

2.4 GROUT FOR STEEL BEARING PLATES

A. See Section 05 12 00.

2.5 <u>RELATED MATERIALS</u>

- A. Preformed Expansion Joint Fillers: Provide closed-cell synthetic rubber joint filler.
- B. Expansion joint material: ASTM D1056-2C.1
- C. Joint Sealing Compound: Provide polyurethane-sealant (see Section 07 92 00.)

- D. Vapor Barrier: Provide vapor barrier cover over prepared base material below slabs on grade. Use materials which are resistant to decay when tested in accordance with ASTM E 154. Membrane must have the following qualities:
 (a) minimum permeance of 0.01 Perms per ASTM E 96; (b) meet or exceed Class A per ASTM E 1745 and (c) not less than 15 mils thick.
 - Acceptable products include Stego Wrap Vapor Barrier by Stego Industries LLC; Vapor Guard by Griffolyn and Premolded Membrane by W. R. Meadows or equals approved by engineer.
- E. Vapor Barrier Accessories: Seam Tape shall be high density polyethylene with pressure sensitive adhesive. Minimum width shall be 4". Seam tape shall be of type recommended by the vapor barrier manufacturer.
- F. Granular Base: Clean mixture of granular soil with 5 percent fines or less. When compacted, the granular base shall provide a smooth and even surface below slabs on grade.
- G. Moisture-Retaining Cover: One of the following, complying with ASTM C-171: Waterproof paper. Polyethylene film. Polyethylene-coated burlap.
- H. Chemical Hardener: Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than 2 lbs. of fluosilicates per gallon.

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> Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following: "Surfhard"; Euclid Chemical Co. "Lapidolith"; Sonneborn-Rexnord.

"Saniseal"; Master Builders.

- I. Liquid Membrane-Forming Curing Compound: Liquid type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.555 gr./sq. cm. when applied at 200 sq. ft./gal.
- J. Underlayment Compound: Freeflowing, self-leveling, pumpable cementitious base compound. Provide one of the following or approved equal:
 - 1. "Flo-Top" Euclid Chemical Co.,
 - 2. Conflow Conspec,
 - 3. "Thoro Underlayment Self-Leveling" Thoro System Products
- K. Bonding Agent: "Euco Weld" by Euclid, "Thorobond" by Standard Dry Wall, "Strongbond" by Conspec, "Weldcrete" by Larsen, or approved equal.

- L. Patching Mortar: "Poly-Patch" by the Euclid Chemical Company, "Thorocrete" by Standard Dry Wall, "Sonopatch" by Sonneborn, Special Patch by Conspec, or approved equal.
- M. Epoxy Joint Filler: "Euco Epoxy No. 700" by the Euclid Chemical Company, "Sikadur Lo-Mod Mortar" by Sika Chemical Corp., Spec Joint CJ by Conspec, or approved equal.
- N. Structural Patching Mortar: 100% solids compound. EUCO Epoxy No. 456, No. 456LV, or No. 460 Mortar by the Euclid Chemical Company; Colma DUR Mortar or LV Mortar or Sikadue Lo-Mod Mortar by Sika Chemical Corp., or approved equal.
- O. Crack Filler: If crack repairs in concrete slabs become necessary under the following terms, use crack-fill 4 made by Metzger/Mcguire (follow the manufacturer's recommendations). Inspect the floor after 90 days, and repair any crack that is more than 1/32" wide
- P. Reglets: Where resilient or elastomeric sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 26 gauge galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.

2.6 PROPORTIONING AND DESIGN OF MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing. Limit use of fly ash to not exceed 25 percent of cement content by weight.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.
- C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:
 - 1. Regular Weight (150 PCF): Based upon 28 days psi compressive strength requirements, provide concrete having compressive strength of 3000 psi for all concrete footings, and miscellaneous concrete.
 - 2. Regular Weight (150 PCF): Based upon 28 days psi compressive strength requirements, provide concrete having compressive strength of 4000 psi for all framed concrete beams, columns, slabs, concrete walls, and slabs-on-grade.
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

2.7 <u>COMPRESSIVE PROPORTIONS AND CONSISTENCY</u>

- A. Intent of specifications is to secure, for every part of work, structural concrete of homogeneous structure which, when hardened, will have required strength and resistance to weathering.
- B. All concrete shall have water-reducing type chemical, admix at place of mixing. Amount of chemical admix per each bag of cement used shall be in strict accordance with manufacturer's recommendations as related to temperature, humidity, and wind conditions prevailing at site at time of pouring, and dependent upon type of admixture being used.
- C. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:
 - 1. Subjected to freezing and thawing; W/C 0.45.
- D. Volumetric proportioning not allowable. Measurement of materials shall be by weight only and by methods that will permit proportions to be accurately controlled and easily checked at any time during work operations.

E. The use of calcium chloride in concrete is prohibited.

- F. Use air-entraining admixture in exterior exposed concrete, unless otherwise shown or specified. Add air-entraining admixture at the manufacturer's prescribed rate to result in concrete at the point of placement having air content within the following limits:
 - 1. Concrete structures and slabs exposed to freezing and thawings or subjected to hydraulic pressure:
 - a. 6% for maximum 3/4-inch aggregate.
 - b. 7% for maximum 1/2-inch aggregate.
- G. Use super plasticizer in concrete for all slab construction. Also use in all pumped concrete and as required for placement and workability.

2.8 <u>SLUMP LIMITS</u>

- A. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows: (Slump may be increased when chemical admixtures are used, provided that the admixture-treated concrete has the same or lower water/cement or water/cementitious material ratio and does not exhibit segregation potential or excessive bleeding.) Concrete mix shall indicate slump without chemical admixtures and with chemical admixtures,
 - 1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
 - 2. Reinforced foundation systems: Not less than 1 inch and not more than 4 inches.
 - 3. Concrete containing HRWR admixture (super-plasticizer): Not more than 8 inches after addition of HRWR to site-verified 2 inches 3 inches slump concrete.
 - 4. Other concrete: Not less than 1 inch nor more than 4 inches.

2.9 <u>CONCRETE MIXING - READY-MIX CONCRETE</u>

A. Comply with the requirements of ASTM C-94, and as herein specified.

- B. Delete the references for allowing additional water to be added to the batch for material with insufficient slump. Addition of water to the batch will not be permitted.
- C. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C-94 may be required.
- D. When the air temperature is between 85 degrees F and 90 degrees F, reduce the mixing and delivery time from 1-1/2 hours to 75 minutes, and when the air temperature is above 90 degrees F, reduce the mixing and delivery time to 60 minutes.

2.10 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice." Use class "B" splice length for all reinforcing bar splices.

PART 3 - EXECUTION

3.1 <u>FORMS</u>

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by the concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
- B. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Construct forms complying with ACI 347, to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, keyways, recesses, moldings, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required on work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste. Install dovetail anchor strips which are furnished under Division 4 Unit Masonry Assemblies
- D. Fabricate forms for easy removal without hammering or prying against the concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.
- E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Place temporary openings on forms at inconspicuous locations.

- F. Chamfer all exposed corners and edges as directed by Architect if not shown, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- G. Form Ties:
 - 1. Factory-fabricated, adjustable-length, removable or snapoff metal ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.
 - 2. Unless otherwise shown, provide ties so portion remaining within concrete after removal is at least 1-1/2 inches inside concrete.
 - 3. Unless otherwise shown, provide form ties which will not leave holes larger than 1 inch diameter in concrete surface.
- H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such ties. Accurately place and securely support items built into forms.
- I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Re-tighten forms after concrete placement if required to eliminate mortar leaks.
- J. Vapor Retarder Installation: Following leveling and tamping of granular base for slabs on grade, place vapor barrier sheeting with longest dimension parallel with direction of pour.
 - 1. The vapor barrier shall be installed to form a continuous sheet across the entire building footprint. Joints shall be overlapped a minimum of 6 inches.
 - 2. Overlapping joints in the vapor barrier shall be sealed per manufacturer's recommendations.
 - 3. Where pipes, columns or other objects penetrate the vapor barrier, it shall be cut and sealed to the pipe, column or penetration using Bituthene Liquid Membrane. Sealant shall be applied in accordance with manufacturer's directions.
 - 4. Punctures or tears in the vapor barrier membrane shall be repaired with manufacturer's recommended materials.
 - 5. Seal vapor barrier membrane to foundation walls or grade beams at building perimeter using approved sealant.
 - 6. Avoid extended traffic over vapor barrier to prevent punctures or tears in the vapor barrier membrane.
 - 7. Where voids between foundation wall and slab edge are accessible, these joints shall be sealed in order to reduce vapor entry.
 - 8. Vapor Barrier shall be installed in strict accordance with the manufacturer's requirements.
- **3.2** UNDERSLAB FILL (GRANULAR BASE): Place under slab fill over entire area of sub grade in interior of building. Place elsewhere as required by the Contract Documents. Tamp and compact under slab-fill until thoroughly compacted to a minimum compacted thickness of 4 inches.

3.3 CONCRETE WORK TOLERANCES

- A. Except when close coordination and fitting of various trades' work precludes allowances of tolerances, maximum total permissible deviations from established lines, grades, and dimensions shall be as stated below. Set and maintain forms in such a manner as to ensure completed work within specified tolerance limits. (See Monolithic Slab Finish For Concrete Slab Tolerances.)
 - 1. Variation from the plumb:
 - a. In lines and surfaces of columns, piers, and in arrises, in 10 feet: 1/4 inch.
 - b. For exposed corner columns, control-joint grooves and other conspicuous lines in any bay or 20-foot maximum: 1/4 inch.
 - 2. Variations from the level or from indicated grades:
 - a. In structural concrete ceiling, beam soffits, and in arrises, in 10 feet: 1/4 inch.
 - b. For exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, in any bay or 20-foot maximum: 1/4 inch.
 - 3. Variations of the linear building lines from established position in plan and related position of columns, walls, and partitions in any bay or 20-foot maximum: 1/4 inch.
 - 4. Variations in sizes and locations of sleeves, floor openings, and wall openings: 1/4 inch.
 - 5. Variations in cross-sectional dimensions of columns and beams and in thickness of walls: 1/4 inch.
 - 6. Variations in footings:
 - a. Variation in dimensions in plan: Minus 1/2 inch; Plus 2 inches (applies to concrete only not to reinforcing bars or dowels).
 - b. Misplacement or eccentricity: 2 percent of footing width in direction of misplacement, but not more than 2 inches. (Concrete only.)
 - 7. Reduction in thickness: Minus 5 percent of specified thickness.
 - 8. Variation in steps: In a flight of stairs:
 - a. Rise: 1/8 inch.
 - b. Tread: 1/4 inch.

3.4 PLACING REINFORCEMENT

- A. Comply with the specified codes and standards, the Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports, and as herein specified. Avoid cutting or puncturing vapor retarder during reinforcing placement and concreting operations.
- B. Clean reinforcement of loose rust and mill scale, soil, ice and other materials which reduce or destroy bond with concrete.
- C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.

- D. Place reinforcement to obtain at least the minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcements in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- E. Do not place reinforcing bars more than 2 inches beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- F. Do not splice reinforcement at points of maximum stress. At points where bars lap or splice, including distribution steel, provide sufficient lap to transfer stress between bars by bond and shear. Stagger splices in adjacent bars. Lap splices in piers, struts, sufficiently to transfer full stress by bond.
- G. Protect metal reinforcement by thickness of concrete indicated. Where not otherwise shown, thickness of concrete over reinforcement shall be as follows:
 - 1. Where concrete is deposited against ground without use of forms: not less than 3 inches.
 - 2. Where concrete is exposed to weather, or exposed to ground but placed in forms: not less than 2 inches for bars more than 5/8 inch in diameter and 1-1/2 inch for bars 5/8 inch or less in diameter.
 - 3. In slabs and walls not exposed to ground: not less than 3/4 inch.
 - 4. In all cases, thickness of concrete over reinforcement shall be at least equal to diameter of bars.
- H. Position all reinforcement accurately. Secure at intersections with annealed wire ties or bar clips. Support with metal supports, spacers, or hangers of approved type. Metal supports (for reinforcing) that are placed directly against horizontal forms, shall have plastic-coated legs wherever the finished concrete surfaces will be exposed in the completed work, and wherever the finished concrete surfaces are to receive any type of directly-applied finish material which could be subject to damage due to stain from rusting of non-plastic-coated materials.
- I. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction. Arrange runways over slabs to avoid traffic directly on mesh during pouring operations. Rolled wire shall be straightened into flat sheets before being placed.

3.5 <u>JOINTS</u>

- A. Construction Joints:
 - 1. Locate and install construction joints, which are not shown on the drawings, so as not to impair the strength and appearance of the structure, as acceptable to the Architect. Locations to be approved by Architect.
 - 2. Provide keyways at least 1-1/2 inches deep in all construction joints in walls, slabs, and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.
 - 3. Place construction joints perpendicular to the main reinforcement. Continue all reinforcement across construction joints, except as otherwise indicated.

- B. Isolation Joints in Slabs-On-Ground:
 - 1. Construction isolation joints in slabs-on-ground at all points of contact between slabs on ground and vertical surfaces, such as column pedestals, foundation walls, grade beams, and elsewhere as indicated.
- C. Joint filler and sealant materials are specified in this section and Division 7 of this Project Manual.
- D. Contraction (Control) Joints in Slabs-on-Ground and Framed Structural Slabs: Construct contraction joints in slabs-on-ground and framed slab as indicated on drawings.
- E. If joint pattern not shown for slab-on-grade, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).

3.6 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto. No aluminum conduit or inserts shall be embedded in concrete.
- B. Install reglets to receive top edge of foundation sheet waterproofing, and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.
- C. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds. Set screeds for slab at girder lines to produce "flat" slab.
- D. If, in the judgement of the Engineer, embedded items are located or grouped in a manner that will weaken the structure, the Contractor shall take necessary corrective steps.

3.7 CONCRETE PLACEMENT

- A. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.
- B. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified.
 - 1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

- C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.
 - 2. Do not use vibrators to transport concrete inside forms.
- D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
 - 1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 - 3. Maintain reinforcing in proper position during concrete placement operations.
 - 4. Compensate for steel beam deflection during concrete placement by providing thicker slab to provide "flat" slab surface.
- E. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.
 - When air temperature has fallen to or is expected to fall below 40 degrees F (4 degrees C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F (10 degrees C), and not more than 80 degrees F (27 degrees C) at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
- F. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
 - 1. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
 - 2. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

3.8 FINISH OF FORMED SURFACES

A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie

holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.

- B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
- C. Smooth Rubbed Finish:
 - 1. Provide smooth rubbed finish to exposed surfaces and to scheduled concrete surfaces, which have received smooth form finish treatment, not later than one day after form removal.
 - 2. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.
- E. Repair of Surface Defects: After forms are removed, any concrete that obviously has been improperly formed or is out of alignment or level beyond required tolerances, or which shows a defective surface that cannot be satisfactorily repaired or patched, shall be removed.

3.9 MONOLITHIC SLAB FINISHES

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated. After placing slabs, plane surface to tolerances for floor flatness (FF) of 18 and floor levelness (FL) of 15. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with stiff brushes, brooms, or rakes.
- B. Float Finish: Apply float finish to monolithic slab surface to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to tolerances of FF 20 - FL 18. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

- C. Trowel Finish:
 - 1. Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating, system.
 - 2. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of FF 25 FL 20. Grind smooth surface defects which would telegraph through applied floor covering system.
- D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.
- E. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, driveways, walks, and ramps, and elsewhere as indicated. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- F. Chemical-Hardener Finish:
 - 1. Apply chemical-hardener finish to all interior exposed concrete floors. See plans for other indicated areas. Apply liquid chemical-hardener after complete curing and drying of the concrete surface. Dilute liquid hardener with water (parts of hardener/water as follows), and apply in 3 coats; first coat, 1/3-strength; second coat, 1/2-strength; third coat, 2/3-strength. Evenly apply each coat, and allow 24 hours for drying between coats.
 - 2. Apply proprietary chemical hardeners, in accordance with manufacturer's printed instructions.
 - 3. After final coat of chemical-hardener solution is applied and dried, remove surplus hardener by scrubbing and mopping with water.

3.10 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
 - 1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.
 - 2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.
- B. Curing Methods: Water cure concrete slabs that are to receive a terrazzo topping. For other concrete perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.
 - 1. Provide moisture curing by following methods.
 - a. Keep concrete surface continuously wet by covering with water.

- b. Continuous water-fog spray.
- c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.
- 2. Provide moisture-cover curing as follows: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape of adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
- 3. Provide curing and sealing compound to exposed interior slabs and to exterior slabs, walks, and curbs, as follows: Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
- 4. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials.
- 5. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
- 6. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.
- 7. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.
- 8. Sealer and Dustproofer: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

3.11 REMOVAL OF FORMS

- A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 degrees F (10 degrees C) for 4 days after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days and until concrete has attained design minimum compressive strength at 28 days.

3.12 MISCELLANEOUS CONCRETE ITEMS

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.
- D. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.
- E. Reinforced Masonry: Provide 3000 psi concrete grout for reinforced masonry cells, masonry lintels, and bond beams where indicated on drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement. See general notes on structural drawings for additional requirements.
- F. Concrete Stairs:
 - 1. Screed and tamp wearing surfaces of treads, landings, and platforms to force fines to surface. Do not dust to remove excess water. Screed and wood float to smooth, level surface. As soon as surface becomes workable, steel trowel to smooth, hard, impervious, polished finish. Work nosing edges carefully to provide extra lines and profiles as required.
 - 2. Add nonslip aggregate to treads, landings, and platforms when such surfaces are not covered with other materials. Apply nonslip aggregate per manufacturer's direction, using 25 pounds per 100 square feet.
 - 3. When metal nosings are required, they will be furnished under another section of these specifications. Install nosings to proper levels as treads are finished. Keep nosings free of all finish materials.
 - 4. Give formed surfaces of risers, stringers, etc., a surface treatment as hereinbefore specified for other non-wearing concrete surfaces, after forms are removed.

3.13 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas:
 - 1. Repair and patch defective areas with cement mortar immediately after removal of forms, but only when acceptable to Architect.
 - 2. Cut out honeycomb, rock pockets, voids over 1/2 inch in diameter, and holes left by tie-rods and bolts, down to solid concrete, but in no case to a depth of less than 1 inch. Make edge of cuts perpendicular to the concrete surface. Before placing cement mortar, thoroughly clean, dampen with

water and brush-coat the area to be patched with neat cement grout. Proprietary patching compounds may be used when acceptable to Architect.

- 3. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color of surroundings.
- 4. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- B. Repair of Formed Surfaces:
 - 1. Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets and holes left by tie-rods and bolts; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning.
 - 2. Repair concealed formed surfaces where possible, that contain defects that adversely affect the durability of the concrete. If defects cannot be repaired, remove and replace the concrete.
- C. Repair of Unformed Surfaces:
 - 1. Test unformed surfaces, such as monolithic slabs, for smoothness and to verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surface sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.
 - 2. Repair finished unformed surfaces that contain defects which adversely affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01 inch wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.
 - 3. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
 - 4. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.
 - 5. Repair defective areas except random cracks and single holes not exceeding 1 inch diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete, and brush with a neat cement grout coating or concrete bonding agent. Place patching concrete before grout takes its initial set. Mix patching concrete of same materials to provide concrete of the same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.
 - 6. Repair isolated random cracks and single holes not over 1 inch in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen

cleaned concrete surfaces and brush with neat cement grout coating. Place dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched areas continuously moist for not less than 72 hours.

- Crack Repair Crack Filler: Use Crack-Fill 4 made by Metzger/McGuire. Inspect the floor after 90 days, and repair any crack that is more than 1/32" wide. Repair cracks by filling with Crack-Fill 4. Follow the manufacturer's recommendations.
- 8. Repair methods not specified above may be used, subject to acceptance of Architect.
- 9. Perform structural repairs with prior approval of Architect or Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.

3.14 QUALITY CONTROL TESTING DURING CONSTRUCTION

- A. The testing agency performing the concrete sample tests shall be the Owner's agent. The testing agency will distribute reports to the Owner, Architect, Engineer(s) and Program Manager only. No reports will be sent to the Contractor alone or through the Contractor.
- B. Sampling and testing for quality control during placement of concrete includes the following:
 - 1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - 2. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
 - 3. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231 pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
 - 4. Concrete Temperature: Test hourly when air temperature is 40 degrees F (4 degrees C) and below, and when 80 degrees F (27 degrees C) and above; and each time a set of compression test specimens made.
 - 5. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
 - 6. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
 - a. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
 - b. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-

place concrete.

- c. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.
- C. Test results will be reported in writing to Architect, Structural Engineer and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.
- D. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests.

3.15 <u>CLEAN-UP</u>

- A. Immediately after completion of concrete operations, remove from site all debris resulting from work.
- B. Immediately prior to final inspection, preliminary to acceptance, wash and clean all exterior concrete wearing surfaces and interior uncovered wearing surfaces. Leave all concrete in clean, acceptable condition.

END OF SECTION

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DIVISION NO. FOUR - MASONRY

SECTION 04 20 00 - MASONRY AND RELATED ITEMS

PART ONE - GENERAL:

- **1-01 <u>REQUIREMENTS</u>:** The requirements of all sections of Division One apply directly to work under this section.
- **1-02 WORK INCLUDED:** Furnish labor and materials necessary to complete masonry work indicated, specified or both.
- 1-03 **SAMPLES:** Submit samples of materials requested.
- **1-04 INSTALLATION:** Installation shall be per Industry Technical Notes and Bulletins.

PART TWO - EXECUTION:

- 2-01 <u>STORAGE OF MATERIALS:</u> Masonry Mortar shall be stored under cover in a dry place, facing masonry units on platforms. Concrete masonry units shall be covered with Polyethylene or tarpaulins. Sand storage piles shall be kept free from contaminants.
- **2-02 WORKMANSHIP:** All masonry shall be laid in a full and even bed of mortar completely filling end and side joints as well as beds. All vertical and horizontal joints shall be of uniform thickness and width. All masonry shall be laid in straight and uniform courses, with horizontal joints straight and dead level and with vertical joints plumb with one directly over the other, and with all faces and corners, straight and true. Cutting of masonry units shall be by power saw, raw and cut edges shall be as straight and true as the natural edges of the units. Wherever possible, use full size units instead of cut units. Coordinate with other trades for items to be built into masonry; build in work required as work progresses. Cutting and patching for this and all trades shall be done by Masonry Mechanics. Step back unfinished work for joining with new work; toothing may be resorted to only when approved by the Architect. Before new work is started, remove loose mortar and wet thoroughly before laying new work.
- **2-03 <u>MORTAR MIXING:</u>** Mortar shall be mixed in proportions of one (1) sack of masonry cement to three cu. ft. of dry sand in a Mechanical type batch mixer. Use of a continuous mortar mixer will not be permitted. Only one brand of mortar mix shall be used throughout the work and shall come from the same source. Mortar that has stood more than one hour shall not be used. Re-tempering of mortar after it has taken its set will not be permitted.

- **2-04** <u>**CONTROL JOINTS:**</u> Control joints shall be installed where indicated or where directed by the Architect all in conformance with the requirements of The National Masonry Association's specifications.
- **2-05 <u>FIRE RATED WALLS:</u>** If fire rated walls are indicated on the drawings, they shall be constructed of the indicated material in compliance with applicable codes and a certificate of compliance shall be sent to the Architect.
- 2-06 <u>COLD WEATHER PRECAUTIONS:</u> Masonry shall not be laid when the temperature of the surrounding atmosphere is 40 degrees F. or less or is likely to fall below 40 degrees F. in the 24 hour period after laying unless adequate protection is provided, and the procedure approved by Architect. No foreign material (containing ice) shall be used.
- **2-07 PROTECTION:** All finished work shall be protected against freezing for a period of not less than 48 hours by means of enclosures.
- **2-08** <u>CLEANING:</u> Keep all masonry work as clean and free of mortar as possible during progress of the work. Point up all voids and open joints. Scrape surfaces of concrete masonry with piece of flat concrete block to remove all excess mortar and dirty spots. Brick cleaning solution shall be Sure Klean 600 of Muriatic Acid. Wet walls before applying solution and protect metal, stone, and other work. Rinse surfaces with clean water immediately after cleaning.
- **2-09 BUILDING CODE REQUIREMENT:** The general contractor shall stencil above the ceiling at all fire wall locations the following notation: "Fire and Smoke Barrier, Protect All Openings" and the fire rating of the wall with a arrow indicating the direction of the fire wall. This shall be stenciled at the locations as directed by the architect every 15'-0" O.C. Run a continuous line between each stencil the entire length of the wall. All stenciling shall be in red.
- **2-10 TOLERANCES:** Tolerances variance from plumb 1/4" 10", variation from level 1/4" 20". Cross section dimension no more than -1/4" or +1/2."
- **2-11 <u>SAMPLE PANELS</u>**: Sample panels shall be constructed of each different type masonry unit. The Contractor shall use care in constructing panels as the Architect will rely on the quality of the sample panel as accepted to establish the level of quality of the entire job.

PART THREE - MORTAR MATERIALS AND REINFORCING:

3-01 <u>MASONRY MORTAR:</u> Masonry mortar shall be pre-mixed per ASTM C-387 Flamingo, LeHigh or approved equal Giant colored cement, Type N packaged in

bags having a minimum volume of 1 cu. ft. with name of manufacturer and weight marked on bag. Color as selected by Architect.

- **3-02 AGGREGATE:** Comply with ASTM C-144 using natural sand free of organic and other deleterious substances.
- **3-03 WATER:** Clean, taken from a source suitable for domestic water consumption.
- **3-04 JOINT REINFORCING:** All exterior and interior masonry walls shall be reinforced with the equivalent of two longitudinal No. 9 gauge or heavier cold drawn wires and No. 12 gauge or heavier cross wires, welded. Wire ASTM A82. Provide reinforcing on 16" centers and in the course above and/or below all openings, 32" longer than the openings. Size of reinforcing shall be standard for the wall thicknesses as indicated on the drawings.
- **3-05** <u>**TIES:**</u> Where impossible or impractical to install joint reinforcing, walls shall be tied using galvanized corrugated strip ties, either straight design or with dovetailed ends for use in concrete slots.

PART FOUR - MASONRY MATERIALS, JOINT AND BOND:

- **4-01** <u>COMMON BRICK:</u> Units shall be hard burned clay conforming to ASTM C-62 Grade 5W, laid in running bond with 3/8" joints.
- **4-02 CONCRETE MASONRY UNITS:** Units shall be hollow lightweight concrete units conforming to the current "Standard Specifications for Hollow Load Bearing Concrete Masonry Units" ASTM C-90 and shall be 100% light aggregates. Aggregates used in the manufacture of units shall meet the requirements and limitations for deleterious substances of the current "Specifications for Lightweight Aggregates for Concrete Units" (ASTM C-331) and shall have a maximum visual classification of light, with maximum stain index of 40. Moisture content at time of delivery shall not exceed 30%. Aggregate shall be produced by the Rotary Kiln Method. The addition of sand, screenings or any other aggregate will not be Units shall have modular dimensions; shall have medium texture allowed. approved, and shall be free from surface defects that will be noticeable when placed. Aggregate shall be 100% Solite or an approved equal. Any substitute only by written permission of the Architect. Blended block may be considered if requested. Concrete masonry units shall be laid in running bond with 3/8" concave tooled joints.

- **4-03 FACE BRICK:** Units shall be standard size 2-3/8" X 7-1/2" X 2-3/8" laid in bond and as indicated with 3/8" concave tooled joints. Lay all units in running bond indicated which is a modified utility bonding arrangement. Color shall be brown range for pricing.
- **4-04** <u>**CONTROL JOINTS IN MASONRY:**</u> Control joints for expansion in masonry units shall be spaced as follows:
 - A. Block Not more than 25'.
 - B. Brick Not more than 50'.
 - C. Utility Wall Not more than 200'.
- **<u>4-05</u>** WEEP HOLES: Weep holes with wicks shall be 33" on center.

End of Section

SECTION 05 50 00 - MISCELLANEOUS METAL

PART ONE - GENERAL

- **1-01 <u>REQUIREMENTS</u>**: The requirements of all sections of Division One apply to work directly under this section.
- **1-02 WORK INCLUDED**: Furnish labor and materials necessary to Miscellaneous Metal and Accessories indicated, specified or both.
- **1-03** <u>COORDINATION</u>: Provide shop drawings, templates or other information necessary for the proper installation and coordination of this work with work of other trades.

PART TWO - PRODUCT AND EXECUTION

- **2-01** <u>**MATERIALS**</u>: Use stock commercial materials, products, patterns and fabrication methods meeting requirements of this Specification and conforming substantially to details and design indicated on the Drawings.
- **2-02 PAINTING**: Prime coat ferrous metal with a rust inhibitive primer standard with the manufacturer after cleaning free from oil, rust and dirt. Do not prime coat cast iron and ferrous metal to be embedded in concrete. Shop prime prefabricated items.
- 2-03 <u>DESIGN AND FABRICATION</u>: Fabricate items to meet applicable codes; conform to the Specification. "Design, Fabrication, and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction, and to support live loads which may normally be imposed unless specified live loads are indicated on the drawings.
- **2-04 WORKMANSHIP**: Work to shape and size with sharp lines and smooth surfaces having welded, bolted or riveted connections. Dress exposed welds. Form joints exposed to the weather to exclude water and drain.
- 2-05 <u>HANGERS AND FASTENERS</u>: Furnish and install anchors, hangers, and bolts of type and size shown and as the conditions require. Include nuts, washers, straps, expansion shields, etc., for securing miscellaneous steel and wood to concrete masonry and other surfaces. Conceal fasteners where practicable. Sub-framing studs and hat channels shall be provided by contractor where required for framing. This includes areas detailed in plans and other areas where framing is required, but not specifically detailed such as ceilings, fascias, soffits, etc. Thickness of metal and details of assembly and supports must give ample strength and stiffness for intended purpose. Provide holes and connections for work of other trades.
2-06 EXPANSION JOINTS: Under this section, furnish labor and materials to install the expansion joints that are indicated on the structural drawings. The expansion joints shall be "elastalum midlin". Floor to wall unit shall be Model ELVW. Floor to floor shall be Model ELV. Wall to wall unit shall be Model SM. Corner wall unit shall be Model SMC. All units shall be installed in strict accordance with the manufacturer's specifications. The following is an approved equal by Metalines Products Company, Inc., Oklahoma City, Oklahoma:

Floor to Wall Unit - Type UDL-10 Floor to Floor Unit - Type UCL-10 Wall to Wall Unit - Type GL-500 Corner Wall Unit - Type GL-600

Approved Equal: MM Systems Corporation.

2-07 ROUGH HARDWARE AND FASTENERS

- (A) Rough Hardware: Furnish bent, or otherwise custom-fabricated, bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable- iron washers for heads and nuts that bear on wood structural connections, and furnish steel washers elsewhere.
- (B) Fasteners General: Provide plated fasteners complying with ASTM B633, Class Fe/Zn 25 for electro-deposited zinc coating, for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.
 - 1. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (ASTM F568, Property Class 4.6), with hex nuts, ASTM A563, (ASTM A563M), and, where indicated, flat washers.
 - 2. Machine Screws: ANSI B18.6.3.
 - 3. Lag Bolts: ANSU B18.2.1 (ANSI B18.2.3.8M).
 - 4. Wood Screws: Flat head, carbon steel, ANSI B18.6.1.
 - 5. Plain Washers: Round, carbon steel, ANSI B18.22.1 (ANSI B18.22M).
 - 6. Lock Washers: Helical, spring type, carbon steel, ANSI B18.21.1.
 - 7. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E488 conducted by a qualified independent testing agency. Material: Group 1 alloy 304 or 316 stainless-steel bolts and nuts complying with ASTM F593 (ASTM F 738M) and ASTM F594 (ASTM F836M).
 - 8. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as required.
 - 9. Cast in Place Anchors in Concrete: Anchors shall be fabricated from corrosion-resistant materials capable of sustaining, without failure, the load imposed within a safety factor of 4, as determined by testing per ASTM E488, conducted by a qualified independent testing agency. Threaded or wedge type; galvanized ferrous castings, either ASTM A47

malleable iron or ASTM A27 cast steel. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A153.

2-08 LOOSE BEARING AND LEVELING PLATES:

(A) Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication if indicated.

2-09 <u>GROUT</u>

(A) Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C1107, specifically recommended by manufacturer for heavy-duty loading applications. Acceptable manufacturers include the following:

Supreme Plus; Cormix Construction Chemicals.

Hi Mod Grout; Euclid Chemical Co.

Embeco 885 and 636; Master Builders Technologies, Inc.

- Ferrolith G Redi-Mix & G-NC; Sonneborn Building Products—ChemRex, Inc. or approved substitution.
- (B) Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically r recommended by manufacturer for interior and exterior applications. Acceptable manufacturers include the following:

B-6 Construction Grout; W.R. Bonsai Co. DiamoNd-Crete Grout; Concrete Service Materials Co. Supreme; Cormix Construction Chemicals. Sure-grip High Performance Grout; Dayton Superior Corp. Euco N-S Grout; Euclid Chemical Co. Five Star Grout; Five Star Products Vibropruf #11; Lambert Corp. Crystex; L & M Construction Chemicals, Inc. Masterflow 928 and 713; Master Builders Technologies, Inc. Sealtight 588 Grout; W.R. Meadows, Inc. Sonogrout 14; Sonneborn Building Products—ChemRex, Inc. Kemset; The Spray-Cure Company or approved substitution.

(C) Concrete Fill: Comply with requirements of Division 3 Concrete for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi, unless higher strengths are indicated.

2-10 LOOSE STEEL LINTELS

- (A) Provide steel lintels of angle or other shapes, light steel framing not included in "Structural Steel", but required to support openings.
- (B) Fabricate loose structural steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
- (C) Weld adjoining members together to form a single unit where indicated.

- (D) Size loose lintels for equal bearing of 1 inch per foot of clear span but not less than 8 inches (200 mm) bearing at each side of openings, unless otherwise indicated.
- (E) Galvanize loose steel lintels located in exterior walls.

2-11 MISCELLANEOUS FRAMING AND SUPPORTS

- (A) General: Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work. Examine heating and ventilating drawings for framing required. Except where specified to be furnished under other sections or in specifications for mechanical trades, install required anchors, guards, supports, structural steel shapes as indicated for support of miscellaneous items.
- (B) Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items. Equip units with integrally welded anchors for casting into concrete or building into masonry.

Furnish inserts if units must be installed after concrete is placed. Except as otherwise indicated, space anchors 24 inches (600 mm) o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches (32 mm) wide by ¼ inch (6mm) thick by 8 inches (200 mm) long.

- (C) Galvanize miscellaneous framing and supports in the following locations:
 - 1. Exterior locations.
 - 2. Interior locations where indicated.

2-12 MISCELLANEOUS STEEL TRIM

- (A) Unless otherwise indicated, fabricate units from structural steel shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices wherever possible.
- (B) Provide cutouts, fittings, and anchorages as required to coordinate assembly and installation with other work. Provide anchors, welded to trim, for embedding in concrete or masonry construction, spaced not more than 6 inches (150 mm) from each end, 6 inches (150 mm) from corners, and 24 inches (600 mm) o.c., unless otherwise indicated.
- (C) Galvanize miscellaneous steel trim in the following locations:
 - 1. Exterior locations.
 - 2. Interior locations where indicated.

PART THREE - EXECUTION

3-01 WORKMANSHIP

(A) Metal surfaces shall be clean and free from mill scale, flake rust and rust biting; well-formed and finished to shape and size with sharp lines and angles and smooth surfaces. Shearing and punching shall leave clean true lines and

surfaces. Weld or rivet permanent connections. Welds and flush rivets shall be finished flush smooth on surfaces that will be exposed after installation. Do not use screws or bolts where they can be avoided; where used, heads shall be countersunk, screwed up tight and threads nicked to prevent loosening.

3-02 INSTALLATION – GENERAL

- (A) Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installing anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.
- (B) Set sleeves in concrete tops flush with finish surface elevations. Protect sleeves from water and concrete entry.
- (C) Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-lace construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- (D) Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- (E) Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop-welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

3-03 FIELD WELDING

- (A) Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.
 - 5. Where field welding galvanized material; grind weld smooth and touch up welded area with galvanized repair paint.

3-04 SETTING LOOSE PLATES

 (A) Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the bearing plate before packing with grout. Use non-shrink, metallic grout in concealed locations where not exposed to moisture; use non-shrink, nonmetallic grout in exposed locations, unless otherwise indicated.

3-05 MISC. ITEM INSTALLATION

- (A) Mount railings to resist a 200 lb. pull in any direction.
- (B) Install abrasive stair tread nosings with strap anchors at a minimum spacing 12" o.c. set in concrete tread. Protect nosings with polyethylene sheeting and plywood walk-boards until completion of the project.
- (C) Installing Pipe Bollards: Anchor bollards in concrete with pipe sleeves present and anchored into concrete spaced 4' o.c. After bollards have been inserted into sleeves, fill annular space between bollard and sleeve solidly with non-shrink, nonmetallic grout, mixed and placed to comply with grout manufacturer's directions. Fill bollards solidly with concrete, mounding top surface.

3-06 ADJUSTING AND CLEANING

- (A) Wash thoroughly using clean water and soap; rinse with clean water.
- (B) Do not use acid solution, steel wool or other harsh abrasive.
- (C) If stain remains after washing, remove finish and restore in accordance with recommendations of fabricator.
- (D) Touch up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1.

3-07 REPAIR OF DEFECTIVE WORK

(A) Remove stained or otherwise defective work and replace with materials that meet specifications requirements.

END OF SECTION

DIVISION NO. SIX – WOOD, PLASTICS AND COMPOSITES

SECTION 06 10 00 - ROUGH CARPENTRY

PART ONE - GENERAL:

- **1-01 <u>REQUIREMENTS</u>:** The requirements of all sections of Division One apply to work under this section.
- **1-02 WORK INCLUDED:** Furnish labor and materials necessary to complete rough carpentry indicated, specified or both.
- **1-03 <u>GRADE MARKING:</u>** "Grade Mark," "Trade Mark" and "Mill Identification Mark" of the associations having jurisdiction shall appear on each piece of material herein specified. Marking shall be by the manufacturers' association recognized as responsible for the grading rules for the material involved or other inspection agency satisfactory to the Architect.
- **1-04 WOOD PRESERVATIVE TREATMENT:** Provide a pressure preservative treatment for all structural lumber and framing subject to deterioration or in contact with masonry, concrete, or moisture. Preservative treatment shall conform to Federal Specification TT-W-571, Table III.
- **1-05 NON-COMBUSTIBLE TREATMENT:** Per OSE manual 5.1.8. **Fire Retardant Treated Wood:** Due to the significant expense the State has incurred removing and replacing failed fire retardant treated wood in structural applications, the Agency may not use fire retardant treated wood, regardless of treatment process, in State buildings. However, with OSE approval, the Agency may use fire retardant treated wood in low humidity locations for non-structural purposes.
- **1-06 TEMPORARY ENCLOSURES AND PROTECTION:** Temporary enclosure of doors, windows and other exterior openings shall be provided when necessary to meet conditions specified, maintained in good repair, and removed when no longer required. Protect door and window frames from traffic and mortar drippings.

PART TWO - MATERIALS:

2-01 GRADES AND SPECIES:

A. Structural Lumber for lintels, beams, posts, joists, and members stressed in bending, compression or tension, shall be of any grade and species that will produce a minimum of 1,200 F. and 1,600,000 E. Exposed structural beams and rafters shall be No. 1 Dense S. R. Southern Pine or Dense Construction Grade Douglas Fir.

- B. Framing lumber for studs, blocking, plates, headers, etc., may be any grade and species commonly used for framing which will produce a minimum "E" of 1,100,000; be classified "standard and better" for Western species, and "No. 2" or "Special Stud Grade" for Southern Pine.
- C. Moisture Content: Moisture content shall not exceed 19%.
- D. Backing Plywood: Miscellaneous Plywood indicated or for use as backing materials for other finishes shall be 3/4" thick sheathing grade with exterior glue, non-com pressure treated.
- E. Miscellaneous: Furring, interior grounds, bridging, blocking and plywood shall be No. 1 SY Pine where allowed by code.
- F. Underlayment: Underlaying where indicated or required shall be 15 pound asphalt saturated felt.
- G. Exterior Blocking: To be treated No. 1 SY Pine.
- H. Utility Boards: Boards for utilities shall be 3/4" APA int. BC Plywood.

PART THREE - EXECUTION:

3-01 <u>GENERAL:</u>

- A. Layout, cut, fit and erect framing, sheathing, bridging, blocking and all items of carpentry. Do cutting work of carpentry for other trades under this contract. Brace, plumb and level all members and secure with sufficient nails, spikes and bolts to insure rigidity. Provide all necessary blocking for plumbing, mechanical and electrical work. Splices in multiple spans of built-up wood beams shall be at quarter points of spans, and staggered, except as noted otherwise.
- B. Provide all framing, blocking, furring, nailers, sleepers and grounds spaced and sized as shown or necessary to complete carpentry. Install with ample bearing on, and anchorage to, supporting structure. All framing shall be cut square on bearing, closely fitted and securely set to required lines and levels. Provide continuous horizontal 2 X 4 blocking, at 4'0" on centers for full height of all stud walls and partitions. Provide solid 2" blocking behind all vertical gypsum board joints and joints spanning over 16" between supports. Frame headers and trimmers around 16" between supports. Frame headers and trimmers around passage of pipes, ducts and other openings in floors, ceilings and roof.

- C. Defects which render any piece unable to satisfactorily serve its intended purpose, including crooked, warped, bowed, or otherwise defective material, even if within the limits of the grade specified, shall be cut out or the piece replaced.
- D. Underlayment: Install 15 lb. over all surfaces that act as a roof sheathed with plywood, over all surfaces requiring drying-in or as indicated on drawings.

End of Section

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SECTION 06 20 00 - FINISH CARPENTRY

PART 1 - GENERAL

1.1 <u>RELATED DOCUMENTS</u>

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

1.2 <u>SUMMARY</u>

- A. This Section includes the following:
 - 1. Exterior standing and running trim and rails.
 - 2. Interior standing and running trim and rails.
 - 3. Plywood paneling.
 - 4. Hardboard siding.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 6 Section "Rough Carpentry" for furring, blocking, and other carpentry work that is not exposed to view.
 - 2. Division 6 Section "Exterior Architectural Woodwork" for exterior woodwork not specified in this Section.
 - 3. Division 6 Section "Interior Architectural Woodwork" for interior woodwork not specified in this Section.
 - 4. Division 7 Section "Building Insulation" for insulation under siding.
 - 5. Division 7 Section "Flashing and Sheet Metal" for flashing and other sheet metal work.
 - 6. Division 7 Section "Joint Sealants" for sealants.
 - 7. Division 9 Section "Painting" for back priming and finishing of finish carpentry.

1.3 <u>SUBMITTALS</u>

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of factory-fabricated product and process specified, including details of construction relative to materials, dimensions of individual components, profiles, textures, and colors.
- C. Wood treatment data as follows including chemical treatment manufacturer's instructions for handling, storing, installation, and finishing of treated material:

- 1. For each type of preservative treated wood product include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
- 2. For water-borne treated products include statement that moisture content of treated materials was reduced to levels indicated prior to shipment to Project site.
- 3. Material test reports from qualified independent testing laboratory indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with requirements indicated.
- 4. Warranty of chemical treatment manufacturer for each type of treatment.
- D. Samples for initial selection purposes of the following in form of manufacturer's color charts consisting of actual units or sections of units showing full range of colors, textures, and patterns available for each type of material indicated.
 - 1. Each type of paneling specified.
 - 2. Each type of siding specified.
- E. Samples for verification purposes of the following:
 - 1. Lumber and panel products for non-factory-applied finish, 50 square inches for lumber and 8-1/2 inches by 11 inches for panels for each species and cut, finished on one side and one edge, with one-half of exposed surface finished.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Arrange for installation of finish carpentry by a firm that can demonstrate successful experience in installing finish carpentry items similar in type and quality to those required for this Project.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels. Provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.
- B. Do not deliver interior finish carpentry until environmental conditions meet requirements specified for installation areas. If finish carpentry must be stored in other than installation areas, store only in areas where environmental conditions meet requirements specified for installation areas.

1.6 **PROJECT CONDITIONS**

A. Environmental Conditions: Obtain and comply with finish carpentry manufacturer's and installer's coordinated advice for optimum temperature and humidity conditions for finish carpentry during its storage and installation.

B. Weather Conditions: Proceed with finish carpentry only when existing and forecasted weather conditions will permit exterior finish carpentry to be installed in compliance with manufacturer's recommendations and when substrate is completely dry.

1.7 <u>WARRANTY</u>

A. Special Project Warranty for Siding: Submit a written warranty, executed by manufacturer, agreeing to repair or replace siding that fails in materials or workmanship within the specified warranty period. Failures include, but are not limited to, deformation or deterioration of siding beyond normal weathering. This warranty shall be in addition to, and not a limitation of, other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 - PRODUCTS

2.1 <u>MATERIALS, GENERAL</u>

- A. Lumber Standards: Comply with PS 20 "American Softwood Lumber Standard" for lumber and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee Board of Review.
- B. Plywood Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood and, for products not manufactured under PS 1, with APA PRP-108.
- C. Inspection Agencies: Inspection agencies and the abbreviations used to reference them with lumber grades and species include the following:
 - 1. RIS Redwood Inspection Service.
 - 2. SPIB Southern Pine Inspection Bureau.
 - 3. WCLIB West Coast Lumber Inspection Bureau.
 - 4. WWPA Western Wood Products Association.
- D. Grade Stamps: Provide lumber with each piece factory-marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
 - 1. For exposed lumber furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps entirely and provide certificates of grade compliance issued by inspection agency.
- E. Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:

- 1. Particleboard: NPA 8.
- 2. Medium-Density Fiberboard: NPA 9.
- 3. Hardwood Plywood: HPMA FE.

2.2 EXTERIOR STANDING AND RUNNING TRIM AND RAILS

- A. Trim and Rails: For trim and rails in form of boards and worked products, provide lumber complying with the following requirements including those of the grading agency listed with species.
 - 1. Species: Western red cedar; WCLIB OR WWPA.
 - a. Grade: C Select.
 - 2. Texture: Surfaced (smooth).
 - 3. Lumber for Transparent Finish (Stained or Clear): Solid lumber stock.

2.3 INTERIOR STANDING AND RUNNING TRIM AND RAILS

- A. Trim and Rails: For trim in form of boards and worked products, provide lumber complying with the following requirements.
 - 1. Species: Western Red Cedar; WWPA.
 - 2. Select Grade: C Select.
 - 3. Finish Grade: Superior.
 - 4. Select Grade: Choice.
 - 5. Species and Appearance: Clear dry red oak free from defects and selected for compatible grain and color.
 - 6. Texture: Surfaced (smooth).
 - 7. Lumber for Transparent Finish (Stained or Clear): Solid lumber stock.
- B. Wood Molding Patterns: For stock molding patterns included in Wood Moulding and Millwork Producers Association WM 7 and graded under WM 4, provide the following grade based on finish indicated and fabricated from species specified:
 - 1. Moldings for Transparent Finish: N-Grade.

2.4 PANELING

- A. Hardwood Veneer Plywood Paneling: Manufacturer's stock hardwood plywood panels complying with applicable requirements of ANSI/HPMA HP.
 - 1. Face Veneer Species: Plain sliced red oak.
 - 2. Backing Veneer Species: Same species as face veneer.
 - 3. Thickness: As shown on drawings
 - 4. Panel Size: 48 inches by 96 inches.
 - 5. Glue Bond: Type II, interior water resistance capability.
 - 6. Glue Bond: Type I, exterior water resistance capability.
 - 7. Face Pattern: Plain without grooves and veneer edge matched within each panel face to comply with type of match required by referenced product standard.
 - 8. Face Pattern: V-grooved, standard random pattern with edge grooves and grooves at center of panel and at third points of panel.

- 9. Face Veneer Matching, Panel to Panel: No match.
- 10. Finish: Manufacturer's standard clear factory finish.
- B. Softwood Plank-Type Paneling: Tongue and groove softwood lumber paneling, designed and fabricated for attachment by adhesives or concealed metal clip system, as manufactured by Ostermann and Scheiwe USA under product name "Profilewood" and as specified.
 - 1. Species: Western red cedar.
 - 2. Species: Knotty cedar.
 - 3. Grain: Mixed grain.
 - 4. Length: 3 feet to 20 feet.
 - 5. Length: Uniform lengths of dimension indicated or required to provide full-length pieces without intermediate end joints.
 - 6. Finish: Manufacturer's standard sanded finish, ready for field application of transparent finish.

2.5 <u>SIDING</u>

- A. Lumber Siding: Kiln-dried wood lumber for siding in size and pattern as shown on drawings.
 - 1. Western Red Cedar Bevel Siding: West Coast Lumber Inspection Bureau Grade "Clear VG Heart," S1S2E.
- B. Manufacturer: Subject to compliance with requirements, provide materials by one of the following:
 - 1. Lumber Siding:
 - a. Abitibi-Price Corp.
 - b. Champion International Corp.
 - c. Georgia-Pacific Corp.
 - d. Masonite Corp.
 - 2. Plywood Siding:
 - a. Abitibi-Price Corp.
 - b. Champion International Corp.
 - c. Georgia-Pacific Corp.
 - 3. Hardboard Siding:
 - a. Abitibi-Price Corp.
 - b. Champion International Corp.
 - c. Georgia-Pacific Corp.
 - d. Masonite Corp.
 - e. Weyerhaeuser.

2.6 MISCELLANEOUS MATERIALS

A. Fasteners for Exterior Finish Carpentry: Stainless steel, noncorrosive aluminum or hot-dip galvanized nails, in sufficient length to penetrate minimum of 1-1/2

inches into substrate unless recommended otherwise by manufacturer.

- 1. Provide prefinished nails for face nailing of material to receive stain in color to match where face nailing is unavoidable.
- 2. Countersink nails and fill surface where face nailing is unavoidable.
- B. 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.
 - 1. Countersink nails, fill surface flush, and sand where face nailing is unavoidable.
 - 2. Where finish carpentry materials are exposed in areas of high humidity, provide fasteners and anchorages with hot-dip galvanized coating complying with ASTM A 153.
- C. Felt Underlayment: Asphalt-saturated organic felts, unperforated, conforming to requirements of ASTM D 26, Type 1, No. 15.
- D. Adhesives: Comply with manufacturer's recommendations for adhesives.
- E. Flashing: Comply with requirements of Division 7 Section "Flashing and Sheet Metal" for flashing materials installed in finish carpentry.
 - 1. Horizontal Joint Flashing for Siding: Preformed galvanized steel or aluminum Z-shaped flashing.
- F. Sealants: Comply with requirements of Division 7 Section "Joint Sealants" for materials required for sealing siding work.

2.7 PRESERVATIVE TREATMENT BY NONPRESSURE METHOD

- A. Treatment Standard: Comply with NWWDA I.S.4 for exterior finish carpentry to receive water-repellent preservative treatment.
 - 1. Water-Repellent Preservative: NWWDA tested and accepted preservative and water-repellent formulation containing 3-iodo-2-propynyl butyl carbamate (IPBC) as its active ingredient.
 - 2. Water-Repellent Preservative/Insecticide: NWWDA tested and accepted preservative and water-repellent formulation containing 3-iodo-2-propynyl butyl carbamate (IPBC) as its active ingredient, combined with an insecticide containing chlorpyrifos as its active ingredient.
 - 3. Extent of Treatment: Treat each item of exterior finish carpentry regardless of species from which it is fabricated.
 - 4. Extent of Treatment: As indicated.

2.8 FABRICATION

A. Wood Moisture Content: Comply with requirements of specified inspection agencies and manufacturer's recommendations for moisture content of finish carpentry in relation to relative humidity conditions existing during time of

fabrication and in installation areas. Provide finish carpentry with moisture content that is compatible with Project requirements.

- B. Fabricate finish carpentry to dimensions, profiles and details indicated. Ease edges to radius indicated for the following:
 - 1. Lumber less than 1 inch in nominal thickness: 1/16 inch.
 - 2. Lumber 1 inch or more in nominal thickness: 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

 Examine substrates for compliance with requirements for installation tolerances and other conditions affecting installation and performance of finish carpentry. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Condition finish carpentry to average prevailing humidity conditions in installation areas before installation for a minimum of 24 hours unless longer conditioning recommended by manufacturer.
- C. Backprime lumber for painted finish exposed on the exterior. Comply with requirements for surface preparation and application in Section "Painting."

3.3 INSTALLATION, GENERAL

- A. Do not use finish carpentry materials that are unsound, warped, bowed, twisted, improperly treated or finished, not adequately seasoned, or too small to fabricate with proper jointing arrangements.
 - 1. Do not use manufactured units with defective surfaces, sizes, or patterns.
- B. Install finish carpentry plumb, level, true, and aligned with adjacent materials. Use concealed shims where required for alignment.
 - 1. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 2. Install to tolerance of 1/8 inch in 8 feet for plumb and level. Install adjoining finish carpentry with 1/16 inch maximum offset for flush installation and 1/8 inch maximum offset for reveal installation.
 - 3. Coordinate finish carpentry with materials and systems that may be in or adjacent to standing and running trim and rails. Provide cutouts for mechanical and electrical items that penetrate exposed surfaces of trim and rails.

- C. Finish in accordance with specified requirements.
- D. Refer to Division 9 Sections for final finishing of finish carpentry.

3.4 STANDING AND RUNNING TRIM AND RAILS

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Stagger joints in adjacent and related standing and running trim and rails. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane back of casings to provide uniform thickness across joints if required.
 - 1. Match color and grain pattern across joints.
 - 2. Install trim after drywall joint finishing operations are completed.
 - 3. Drill pilot holes in hardwood prior to nailing or fastening to prevent splitting. Fasten to prevent movement or warping. Countersink nail heads exposed carpentry work and fill holes.
 - 4. Fit exterior joints to exclude water. Apply flat grain lumber with bark side exposed to weather.

3.5 PANELING

- A. Plywood Paneling: Select and arrange panels on each wall for best match of adjacent panels for paneling where grain character or color variations are noticeable. Install with uniform tight joints between panels.
 - 1. Attach panels to supports with manufacturer's recommended panel adhesive and fasteners. Space fasteners as recommended by panel manufacturer.
 - 2. Conceal fasteners to greatest extent practical.
 - 3. Arrange panels with V-grooves and joints over supports, and fasten to supports with nails of type and at spacing recommended by panel manufacturer. Use fasteners with prefinished heads matching V-groove color.
- B. Hardboard Paneling: Install in accordance with manufacturer's recommendations. Leave 1/4-inch gap to be covered with trim at top, bottom, and openings. Butt adjacent panels with moderate contact.
 - 1. Stud Substrate: Install with 1-inch annular ring shank hardboard nails.
 - 2. Plaster or Wallboard Substrate: Install with 1-5/8-inch annular ring shank hardboard nails.
 - 3. Nailing: Space nails 4 inches apart at all edges and 8 inches apart at intermediate stud or furring locations unless required otherwise by manufacturer.
- C. Plank Paneling: Install in accordance with manufacturer's instructions. Arrange in random-width pattern suggested by manufacturer, unless boards or planks are of uniform width. Stagger end joints in random pattern to uniformly distribute

joints on each wall. Install with uniform joints with only tongue-and-groove joints or end-matched joints within each field of paneling.

- 1. Select and arrange panels on each wall for best match of adjacent panels for paneling where grain character or color variations are noticeable. Install with uniform tight joints between panels.
- 2. Fasten paneling to substrate complying with manufacturer's recommendations for concealed nailing.
- 3. Fasten paneling to wood substrate using manufacturer's concealed clip system.
- 4. Fasten paneling to gypsum wallboard substrates using adhesive.

3.6 <u>SIDING</u>

- A. Underlayment: Apply one layer of felt underlayment horizontally over entire surface to receive siding, lapping ends and succeeding courses a minimum of 2 inches. Fasten felt with sufficient number of galvanized roofing nails or noncorrosive staples to hold underlayment in place until siding application.
- B. Lumber Siding: Apply starter strip along bottom edge of sheathing or sill. Install first course of siding with lower edge at least 1/8 inch below starter strip and subsequent courses lapped 1 inch over course below. Nail at each stud.
 - 1. Leave 1/8-inch gap at trim and corners unless recommended otherwise by manufacturer and apply sealant.
 - 2. Butt joints only at stud locations, nailing top and bottom on each side and staggering joints in subsequent courses.
 - 3. Install prefabricated outside corners as recommended by manufacturer of siding materials.
- C. Hardboard Siding: Install hardboard siding complying with AHA "Recommended Basic Application Instructions for Hardboard Siding." Install panels with edges backed by solid lumber framing or blocking. Leave 3/16-inch space at perimeter and openings unless recommended otherwise by panel manufacturer.
 - 1. Seal butt joints at inside and outside corners and at trim locations.
 - 2. Install continuous metal flashing at horizontal panel joints with 1/8-inch expansion gap.
 - 3. Apply battens and corner trim as detailed on the drawings.
 - 4. Conceal fasteners to greatest extent practical by countersinking and filling, by placing in grooves of siding pattern, or by concealing with applied trim or battens as detailed.
- D. Flashing: Install metal flashing as indicated on the drawings and recommended by siding manufacturer.
- E. Finish: Apply finish within 2 weeks of installation.
- F. Install siding to comply with manufacturer's warranty requirements.

3.7 <u>ADJUSTING</u>

A. Repair damaged or defective finish carpentry where possible to eliminate functional or visual defects. Where not possible to repair, replace finish carpentry. Adjust joinery for uniform appearance.

3.8 <u>CLEANING</u>

A. Clean finish carpentry on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.9 **PROTECTION**

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

END OF SECTION 06200

SECTION 06 40 23 - INTERIOR ARCHITECTURAL WOODWORK

PART ONE - GENERAL:

- **1-1 <u>REQUIREMENTS:</u>** The requirements of all sections of Division One apply to work under this section.
- **1-2 WORK INCLUDED:** Furnish labor and materials necessary to complete all finished carpentry, millwork and related items required, indicated and/or specified.

1-3 <u>GENERAL:</u>

- A. Grade Marking: "Grade Mark," "Trade Mark" and "Mill Identification Mark" or the associations having jurisdiction shall appear on each piece of standard yard dimension lumber and boards except that shipments may be accomplished by a certificate of inspection identifying the shipment and certifying compliance with the requirements of this inspection. This certificate of inspection shall be issued by the manufacturer's association recognized as responsible for the grading rules for the species involved or other inspection agency satisfactory to the Architect.
- B. Molding: Moldings shall conform to the details on the drawings except that stock trim of the same general type fulfilling all functions of the work if approved by the Architect, will be accepted. Miter all running trim.
- C. Moisture content: Finish lumber and millwork shall not exceed 12% moisture content.
- D. Sizing: Surface lumber four sides to conform to Simplified Practice Recommendation Sr-16.
- E. Dimensions: Specified for lumber are nominal.
- F. Compliance standards: Wood shelving, mailboxes, mandatory blocks and miscellaneous millwork shall comply with "Quality Standards" of AWI for premium, custom or economy as required.

PART TWO - EXECUTION:

2-1 <u>STORAGE AND PROTECTION:</u> Protect millwork against dampness during and after delivery. Store in well-ventilated building and where not exposed to extreme changes of temperature and humidity. Wood doors shall be stored in a flat position one above another on solid level supports with air circulation excluded from top and

bottom surfaces. Note: "Do not deliver woodwork to jobsite until build and storage areas are sufficiently dry to prevent damage from changes in moisture content."

2-2 <u>MILLWORK AND TRIM:</u>

- A. General: Install exterior and interior millwork and finish trim with tight joints securely nailed. Set exposed heads of finished nails for putty. Sand woodwork as necessary to remove irregularities and machine marks. Leave work free from defects and blemishes.
- B. Joints: Shall be tight and formed to conceal shrinkage. Make outside joints to exclude water and set in lead paste. Door and window trim shall be in a single length without splicing. Corners shall be mitered unless otherwise indicated. Running trim shall be in long length and jointed only where solid fastening can be made. End joints in built-up members shall be well distributed. Miter exterior corners and running joints and cope interior angles. Where required, scribe woodwork to adjacent work.
- C. Back prime all exterior finish trim and woodwork before installation with one coat of paint specified for exterior priming. See Division PAINTING.
- D. Defects which render any piece unable to satisfactorily serve its intended purpose, including crooked, warped, bowed, or otherwise defective material, even if within the limits of the grade specified, shall be cut or the piece replaced.
- 2-3 <u>WOOD AND HOLLOW METAL DOORS:</u> Furnish labor for installing all doors and related hardware under this section. Doors and related hardware are specified under Division Eight. =<u>Do Not</u>= remove fire rating labels from doors.

PART THREE - MATERIALS:

- **3-1 <u>GRADES AND SPECIES:</u>** Unless otherwise specified:
 - A. Exterior trim shall be any of the following species and minimum grades: Except as specified herein.
 Pine, Ponderosa, D. Select (if chemically treated)
 Pine, Southern, C.
 - B. Interior trim shall be any of the following species and minimum grades except as specified herein:

Pine, Ponderosa, D. Select Pine, Southern, C

Trim shall not contain defects such as wans or loose knots exposed.

3-2 INTERIOR DOORS: See Division Eight.

PART FOUR - ARCHITECTURAL WOODWORK:

4-01 GENERAL DESCRIPTION OF WORK:

- A. The architectural woodwork is illustrated on the drawings.
- B. The different types of architectural woodwork include the following:
 - 1. Interior trim and sills.
 - 2. Architectural cabinets: Cubbies, laminate clad cabinets, countertops and shelving.
- **4-2** <u>ACCEPTABLE MANUFACTURER:</u> Manufacturers must meet the following criteria to be considered acceptable:
 - 1. Five years experience.
 - 2. AWI member or signed certificate of compliance with AWI standards.
 - 3. Submit a sample cabinet 10 days before bid.
 - 4. Submit a resume of recent jobs and contracts.

4-3 <u>SUBMITTALS:</u>

- A. Drawings:
 - 1. Submit a drawing on all 11 x 17 sheet.
 - a. Five copies and one sepia.
 - b. Scale: 3/8" scale floor plan.;
 - 1/2" scale elevation; and
 - 1-1/2" scale section.
 - 2. Flag any deviations from original plans and specs.
 - 3. Flag any recommendations incorporated in submittal data.

B. Samples:

- 1. 12" x 12" sample of materials used in exposed surfaces.
- 2. 12" x 12" sample of materials used in unexposed surfaces.
- 3. Hardware data sheets.
- C. Sample Cabinet: Depending on the nature and the size of the project, a full sized sample incorporating all functioning hardware and material representation may be required.

- **4-4** <u>**CLOSET/STORAGE SHELVING:**</u> Closet and storage shelving to be AWI custom grade for transparent finish.
- 4-5 <u>CONDITION OF JOB SITE:</u> Prior to delivery and installation:
 - A. All wet work is to be completed.
 - B. All ceiling grid and scaffold work is to be completed.
 - C. All walls and ceilings are to be primed in pertinent areas.
 - D. Complete furring and blocking for:
 - 1. Upper cabinet accommodation.
 - 2. Counter top accommodation (referring to counters without cabinets.)
 - 3. Any other cabinet suspended from wall.
 - E. All windows and exterior doors are to be completed and secure.
 - F. Manufacturers and installers require the temperature, humidity, and moisture conditions are acceptable, and that it is maintained throughout the duration of the project. Building must be closed in completely.

4-6 STORAGE AND PROTECTION:

- A. Cabinets should be stored and protected until time of installation (see condition of job site).
- B. All items should be protected during handling and transit to prevent damage.

4-7 INSTALLATION:

- A. Installer is to advise the General Contractor of building condition.
- B. Special film protecting counter tops and laminate is to be left on until final touch-up.
- C. Caulking (unless otherwise specified) shall be by installers.
- D. All cabinet, shelves, cases, etc., are to be erected and mounted firmly with the appropriate fasteners for drywall, wood, metal or concrete walls.
- E. Level, plumb and align all components.
- F. All screws are to have the appropriate screw caps.
- G. Retainer screw or the appropriate retainer is to be provided and installed on all open adjustable shelf cabinets.

- H. All components are to be scribed to fit the wall and caulked.
- I. Dust covers will be provided for cabinets 6' tall and over.
- J. All adjustments and clean up will be provided by installers.

PART FIVE - SPECIAL NOTES:

5-1 <u>CABINET HARDWARE:</u> All cabinet hardware is to be provided under this specification. All hardware is to be presented in sample to the Architect per approval by the Owner.

End of Section

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DIVISION NO. 7 - MOISTURE PROTECTION

SECTION 07 13 00 - WATERPROOFING

PART ONE - GENERAL:

- **1-01 <u>REQUIREMENTS</u>:** The requirements of all sections of Division One apply to work under this section.
- **1-02 WORK INCLUDED:** Furnish labor and materials necessary to complete waterproofing indicated, specified or both. Provide to Owner a five-year guarantee on Rainguard on all exterior masonry surfaces, brick, and Dryvit.

PART TWO - PRODUCTS:

2-01 MATERIALS:

- A. Vapor Barrier: 4 MIL Polyethylene Film "Visqueen" or equal.
- B. Dampproofing: Clear silicon water repellent of 3% to 5% solution. Material shall be RAINGUARD or approved equal. Installation by firm with min. of three years track record installing products specified with five year guarantee on brick, and Dryvit.
- C. Mastic Waterproofing: Hydroxide Mastic #700 or approved equal by Tomco, Someborn, Chem.-Mastersor Tremco, behind all face brick. Installation by firm with min. of three years track record installing products specified.

PART THREE - EXECUTION:

- **3-01 <u>VAPOR BARRIER</u>:** Apply vapor barrier over surface of smooth, compacted subgrade before placing interior concrete slabs. Lap joints not less than 6". Protect from damage and if punctured, seal punctures with a patch before concrete is poured.
- **3-02 DAMPPROOFING:** Apply by spray, a two-coat application, in complete accordance with the manufacturer's recommendations, on all exterior masonry. Each application shall be in a perpendicular direction. A five-year warranty shall be furnished.
- **3-03 MASTIC WATERPROOFING:** Treat the following areas with hydroxide mastic #700 in a two-step application in accordance with manufacturers' specifications. All walls which are below normal floor elevation shall be treated. All walls behind the face brick shall be treated. Treatment shall be from footing to parapet continuous on all

exterior walls. Should Contractor elect to install by spray application, care shall be taken note to dilute the product. If dilution is called for by manufacturer, Contractor shall apply three (3) coats in lieu of two (2).

PART FOUR - GUARANTEES:

- **4-01** <u>**MEMBRANES:**</u> All membranes to be guaranteed watertight for a minimum of five (5) years.
- **4-02 INSTALLATION:** The entire installation shall be guaranteed watertight.
- **4-03 PRODUCTS:** All products used shall be either from or all approved by the same manufacturer.

End of Section

SECTION 07 21 00 - BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 <u>SUMMARY</u>

- A. This Section includes the following:
 - 1. Building insulation in batt form.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 9 Section indicated below for thermal insulation and sound attenuation insulation installed as part of wood-framed wall and partition assemblies:

1.3 **DEFINITIONS**

A. Thermal Resistivity: Where the thermal resistivity of insulation products are designated by "r-values," they represent the reciprocal of thermal conductivity (k-values). Thermal conductivity is the rate of heat flow through a homogenous material exactly 1 inch thick. Thermal resistivities are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

1.4 <u>SUBMITTALS</u>

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of insulation product specified.
- C. Samples of exposed insulation for initial selection purposes consisting of actual units or sections of units showing full range of colors available for each type of exposed insulation indicated.
- D. Samples for verification purposes in full-size units of each type of exposed insulation indicated for each color specified.

- E. Product test reports from and based on tests performed by qualified independent testing laboratory evidencing compliance of insulation products with requirements including r-values (aged values for plastic foam insulations), fire performance characteristics, perm ratings, water absorption ratings, and other properties, based on comprehensive testing of current products.
- F. Research reports or evaluation reports of the model code organization acceptable to authorities having jurisdiction that evidence compliance of plastic foam insulations with building code in effect for Project.

1.5 QUALITY ASSURANCE

- A. Fire Performance Characteristics: Provide insulation materials identical to those whose indicated fire performance characteristics have been determined per the ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting organization.
 - 1. Surface Burning Characteristic: ASTM E 84.
 - 2. Fire Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.
- B. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's recommendations for handling, storage, and protection during installation.
- B. Protect plastic insulation as follows:
 - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver plastic insulating materials to project site ahead of installation time.
 - 3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering insulation products that may be incorporated in the work include, but are not limited to, the following:
 - 1. Manufacturers of Glass Fiber Insulation:
 - a. CertainTeed Corp.
 - b. Knauf Fiber Glass GmbH.
 - c. Manville: Building Insulations Div., Manville Sales Corp.
 - d. Owens/Corning Fiberglas Corp.

2.2 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
 - 1. Preformed Units: Sizes to fit applications indicated, selected from manufacturer's standard thicknesses, widths, and lengths.
- B. Unfaced Mineral Fiber Blanket/Batt Insulation: Thermal insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type I (blankets without membrane facing); and as follows:
 - 1. Mineral Fiber Type: Fibers manufactured from glass or slag.
 - 2. Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50, respectively.
- C. Faced Mineral Fiber Blanket/Batt Insulation: Thermal insulation produced by combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665 for Type III, Class A (blankets with reflective vapor-retarder membrane facing with flame spread of 25 or less); foil-scrim-kraft or foil-scrim-polyethylene vapor-retarder membrane on one face, and as follows:
 - 1. Mineral Fiber Type: Fibers manufactured from glass or slag.
 - 2. Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50, respectively.
 - 3. Flanged Units: Provide blankets/batts fabricated with facing incorporating 4-inch-wide flanges along their edges for attachment to framing members.

2.3 SAFING INSULATION AND ACCESSORIES

- A. Semi-Refractory Fiber Board Safing Insulation: Semi-rigid boards designed for use as a fire stop at openings between edge of slab and exterior wall panels, produced by combining semi-refractory mineral fiber manufactured from slag with thermosetting resin binders to comply with ASTM C 612, Class 1 and 2; nominal density of 4.0 pcf; passing ASTM E 136 for combustion characteristics; r-value of 4.0 at 75 deg F (23.9 deg C).
- B. Calking Compound: Material approved by manufacturer of safing insulation for sealing joint between foil backing of safing insulation and edge of concrete floor slab against penetration of smoke.

- C. Safing Clips: Galvanized steel safing clips approved by manufacturer of safing insulation for holding safing insulation in place.
 - 1. Number of Layers: Three layers of polyethylene film and two layers of nylon cord reinforcing, with an overall thickness of 10.0 to 12.0 mils.
- D. Foil-Polyester Film Vapor Retarder: Two layers of 0.5-mil-thick polyester film laminated to an inner layer of 1.0-mil-thick aluminum foil, with maximum flame spread and smoke developed ratings of 15 and 5, respectively.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions with Installer present, for compliance with requirements of the Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections that might puncture vapor retarders.
- B. Close off openings in cavities receiving poured-in-place insulation to prevent the escape of insulation. Provide bronze or stainless steel screen (inside) where openings must be maintained for drainage or ventilation.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's instructions applicable to products and application indicated. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specific recommendations before proceeding with installation of insulation.
- B. Extend insulation full thickness as indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement.
- C. Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent

placement and support of units.

- B. Set vapor retarder faced units with vapor retarder to warm side of construction, except as otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
 - 1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
- C. Set reflective, foil-faced units accurately with not less than 0.75-inch air space in front of foil as indicated.

3.5 INSTALLATION OF SAFING INSULATION

A. Install safing insulation to fill gap between edge of concrete floor slab and back of exterior spandrel panels on safing clips spaced as needed to support insulation but not further apart then 24 inches o.c. Cut safing insulation wider than gap to be filled to ensure compression fit and seal joint between insulation and edge of slab with calking approved by safing insulation manufacturer for this purpose. Leave no voids in completed installation.

3.6 INSTALLATION OF VAPOR RETARDERS

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose fiber insulation.
- B. Seal vertical joints in vapor retarders over framing by lapping not less than 2 wall studs. Fasten vapor retarders to framing at top, end, and bottom edges, at perimeter of wall openings, and at lap joints; space fasteners 16 inches o.c.
- C. Seal overlapping joints in vapor retarders with adhesives or tape per vapor retarder manufacturer's printed directions. Seal butt joints and fastener penetrations with tape of type recommended by vapor retarder manufacturer. Locate all joints over framing members or other solid substrates.
- D. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor retarder manufacturer.
- E. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with tape of type recommended by vapor retarder manufacturer to create an airtight seal between penetrating objects and vapor retarder.
- F. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with tape or another layer of vapor retarder.

3.7 **PROTECTION**

A. General: Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation will be subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 21 19 FOAMED-IN-PLACE INSULATION

PART 1 - GENERAL

1.1 <u>SUMMARY</u>

- A. This section includes the following:
 - 1. Closed-cell, medium-density spray polyurethane foam insulation. (JM Corbond III)
- B. Related Work in other Sections includes the following:
 - 1. Section 014000 Quality Requirements; coordination with Owner's independent testing and inspection agency.
 - 2. Section 014000 Mock-Ups; exterior wall mock-ups.
 - 3. Section 015000 Temporary Facilities and Controls; requirement to schedule work to prevent sunlight and weather exposure of materials beyond limits established by manufacturer; requirement to protect materials from damage after installation and prior to installation of enclosing work.
 - 4. Section 033000 Cast-In-Place Concrete; requirement that backup concrete be smooth without protrusions.
 - 5. Section 042000 Unit Masonry; requirement that backup masonry joints are flush and completely filled with mortar, and that excess mortar on brick ties will be removed; requirement for gap at deflection joints and fillers; coordination with sequencing of through-wall flashing.
 - 6. Section 054000 Cold-Formed Metal Framing; metal exterior wall framing assemblies to support the closed-cell, medium density sprayed polyurethane foam.
 - 7. Section 061600 Sheathing; requirement that backup gypsum sheathing has been installed.
 - 8. Section 075000 Membrane Roofing; requirement for coordination with sequencing of membrane roofing; requirement to seal roof membrane to wall air barrier.

1.2 <u>REFERENCES</u>

- A. ASTM International:
 - 1. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - 2. ASTM C1029 Standard Specification for Spray-Applied Rigid Cellular Polyurethane Thermal Insulation.
 - 3. ASTM C1338 Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
 - 4. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
 - 5. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 - 6. ASTM D1940 Method of Test for Porosity of Rigid Cellular Plastics.
 - 7. ASTM D2842 Standard Test Method for Water Absorption of Rigid Cellular Plastics.
 - 8. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 9. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

- 10. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
- 11. ASTM E283 Standard Test Method for Determining Rate of Air Leakage.
- 12. ASTM E413 Classification for Rating Sound Insulation.
- 13. ASTM E2178 Standard Test Method for Air Permeance of Building Materials.
- 14. ASTM E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

B. NFPA

- 1. NFPA 285 Standard Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.
- 2. NFPA 286 Standard Test Method of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
- 3. Section 015000 Temporary Facilities and Controls; requirement to schedule work to prevent sunlight and weather exposure of materials beyond limits established by manufacturer; requirement to protect materials from damage after installation and prior to installation of enclosing work.

1.3 <u>PERFORMANCE REQUIREMENTS</u>

- A. Fire-Test-Response Characteristics: Provide insulation and related materials with the firetest-response characteristics indicated, as determined by testing identical products per test methods indicated below or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - a. Surface Burning Characteristics (ASTM E84):25 / 450.
 - b. Assembly Fire Resistance Rating (NFPA 285): Passes NFPA 285 as part of an approved assembly.
 - c. Combustion Characteristics (NFPA 286): Pass
- B. Material Performance: Provide materials which have an air permeance not to exceed 0.004 cubic feet per minute per square foot under a pressure differential of 0.3 in. water (1.57 pounds per square foot) [0.02 liters per second per square meter at a pressure difference of 75 Pascals (0.02 L/(s⋅m²) @ 75 Pa)] when tested in accordance with ASTM E 2178 (unmodified). The water vapor permeance shall be determined in accordance with ASTM E 96 and shall be declared by the manufacturer.
- C. Assembly Performance: Provide a continuous air barrier in the form of an assembly that has an air leakage not to exceed 0.040 cubic feet per square foot per minute under a pressure differential of 0.3 in. water (1.57 pounds per square foot) [0.20 liters per second per square meter at a pressure difference of 75 Pascals (0.20 L/(s·m²) @ 75 Pa)] when tested in accordance with ASTM E 2357. Assembly shall accommodate movements of building materials by providing expansion and control joints as required. Expansion / control joints, changes in substrate and perimeter conditions shall have appropriate accessory materials at such locations.
 - 1. Assembly shall be capable of withstanding combined design wind, fan and stack pressures, both positive and negative on the envelope without damage or displacement, and shall transfer the load to the structure.

- 2. Assembly air barrier material shall not displace adjacent materials in the assembly under full load.
- 3. Assembly shall be joined in an airtight and flexible manner to the air barrier material of adjacent assemblies, allowing for the relative movement of assemblies due to thermal and moisture variations, creep, and anticipated seismic movement.
- D. Adjacent Materials: Install closed-cell spray polyurethane foam to prevent air leakage at the following locations:
 - 1. Foundation and walls, including penetrations, ties and anchors.
 - 2. Walls, windows, curtain walls, storefronts, louvers and doors.
 - 3. Wall and roof connections.
 - 4. Walls and roof to utility, pipe and duct penetrations.
 - 5. Seismic and expansion joints.
 - 6. All other potential air leakage pathways in the building envelope.

1.4 <u>SUBMITTALS</u>

- A. Submittals: Submit in accordance with Division 01 requirements.
- B. Product Data: Submit manufacturer's product data, manufacturer's instructions for evaluating, preparing, and treating substrate, temperature and other limitations of installation conditions, technical data, and tested physical and performance properties.
 - 1. Submit letter from primary materials manufacturer indicating approval of products not manufactured by primary manufacturer.
 - 2. Include statement that materials are compatible with adjacent materials proposed for use.
 - 3. Submit letter from the sealant manufacturer indicating sealant adhesion to the air barrier material meet the requirements of the project.
- C. Samples: Submit clearly labeled samples, three inch by 4 inch (75 mm by 100 mm) minimum size of each material specified.
- D. Shop Drawings: Submit shop drawings showing locations and extent of air barrier assemblies and details of all typical conditions, intersections with other envelope assemblies and materials, membrane counter-flashings, and details showing how gaps in the construction will be bridged, how inside and outside corners are negotiated, how materials that cover the materials are secured with air-tight condition maintained, and how miscellaneous penetrations such as conduits, pipes, electric boxes and similar items are sealed.
 - 1. Include VOC content of each material, and applicable legal limit in the jurisdiction of the project.
 - 2. Include statement that materials are compatible with adjacent materials proposed for use.
 - 3 Include recommended values for field adhesion test on each substrate.
- E. Compatibility: Submit letter from manufacturer stating that materials proposed for use are permanently chemically compatible and adhesively compatible with adjacent materials
proposed for use. Submit letter from manufacturer stating that cleaning materials used during installation are chemically compatible with adjacent materials proposed for use.

- F. Accredited Laboratory Testing for Materials: Laboratory accredited by International Accreditation Service Inc. (IAS), American Association for Laboratory Accreditation (A2LA), or the Standards Council of Canada (SCC).
- G. VOC Regulations: Provide products which comply with applicable regulations controlling the use of volatile organic compounds.
- H. Preconstruction Meeting: Convene a minimum of two weeks prior to commencing Work of this Section. Agenda shall include, at a minimum, construction and testing of mock-up, sequence of construction, coordination with substrate preparation, air barrier materials approved for use, compatibility of materials, coordination with installation of adjacent and covering materials, and details of construction and chemical/fire safety plans. Attendance is required by representatives of related trades including covering materials, substrate materials and adjacent materials.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing urethane foam products and systems of this section with minimum ten years documented experience.
- B. Building Assembly Testing: A copy of the ASTM E 2357 test report showing drawings which identify the materials and photos of the assemblies tested, and the following results reported: air infiltration and exfiltration through the assembly at 0.3 inches water (75 Pa) both before and after pressure cycling, for both specimen one and specimen two.
- C. Regulatory Requirements and Approvals: IAPMO
 - 1. Report Number: 146

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product, date of manufacture, and directions for storage.
- B. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier spray foam manufacturer. Protect stored materials from direct sunlight.
- C. Handle materials in accordance with manufacturer's recommendations.

1.7 **PROJECT CONDITIONS**

A. Temperature: Install closed-cell, medium density spray polyurethane foam air barrier within range of ambient and substrate temperatures recommended by air barrier manufacturer. Do not apply air barrier to a damp or wet substrate.

- B. Field Conditions: Do not install air barrier in snow, rain, fog, or mist. Do not install air barrier when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the manufacturer.
- C. Sequencing. Do not install air barrier material before the roof assembly has been sufficiently installed to prevent a buildup of water in the interior of the building.
- D. Compatibility. Do not allow closed-cell, medium density spray polyurethane foam to come in contact with chemically incompatible materials.
- E. Ultra-violet exposure. Do not expose the air barrier material to sunlight longer than as recommended by the manufacturer (if applicable).

1.8 <u>WARRANTY</u>

- A. Manufacturer's Warranty: Provide manufacturer's standard product warranty, for a minimum 1 year from date of Substantial Completion.
- B. Manufacturer's Warranty: Provide manufacturer's limited product warranty, for a maximum of 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FOAMED-IN-PLACE INSULATION

- A. Medium Density Closed Cell Spray Polyurethane Foam Air Barrier: JM Corbond III, manufactured by Johns Manville Carlisle, Certa Spray or approved equal. Air barrier system shall not require the priming of substrates nor the application of sealing tape at wallboard seams and other wall penetrations.
 - 1. Third Party Verification: IAPMO ES #0146.
 - 2. Application Rate: Up to 3.5 inches in a single pass, to the total thickness required for the project.
 - 3. Physical Properties:
 - a. Nominal Density (ASTM D1622): 2.0 lb/cu.ft.
 - b. Compressive Strength, 1 inch thickness (ASTM D1621): 36 psi.
 - c. Compressive Strength, 3 inch thickness (ASTM D1621): 30 psi.
 - d. Closed-Cell Content (ASTM D1940): Greater than 90 percent.
 - e. K-Factor (ASTM C518 initial): 0.15.
 - f. K-Factor (ASTM C1029 180-day aged): 0.16.
 - g. R-Value (ASTM C518 initial): 7.0.
 - h. R-Value (ASTM C1029 180-day aged): 7.0.
 - i. Water Absorption (ASTM D2842): 0.020 (gm/cc).
 - j. Water Vapor Transmission (ASTM E96): 0.61 perms at 1.5 inches.
 - k. Air Infiltration (ASTM E283): 75 Pa 0.001 L/S/m² (1.57 psf) (less than 0.001 cfm/ft²); 300 Pa 0.001 L/S/m² (6.24 psf) (less than 0.001 cfm/ft²).
 - I. Air Permeance (ASTM E2178): 75 Pa 0.000055 L/S.m².Pa 0.000117 ft³/min.mw.Pa; 300 Pa 0.000024 L/./m².Pa 0.000051 ft³/min.mw.Pa.

- m. Sound Transmission Coefficient (STC) (ASTM E90 and ASTM E413): 36 STC;
 2x4 wood stud, 16 inches on centers, 2.76 of JM Corbond III SPF, 15/32 inch exterior OSB sheeting, 1/2 inch gypsum wallboard.
- n. Recycled Content of Side B: 10 percent (pre- and post-consumer).
- B. Transition Strip at Joint Between Wall and Foundation: Provide a minimum 40-mil selfadhering transition strip between the wall construction and the foundation to shed water to the exterior. Comply with both air barrier manufacturer's recommendations and material manufacturer's recommendations.

2.2 ACCESSORIES

- A. Primer: As required by insulation manufacturer base on substrate materials and conditions.
- B. Thermal Barrier: Spray applied foam insulation must be separated from the interior of the building by an approved thermal barrier, such as 1/2-inch (min) gypsum wallboard, or an equivalent 15-minute thermal barrier complying with the applicable code. The alternative thermal barrier coating system shall be applied to the closed cell polyurethane foam insulation and tested to the criteria of NFPA 286, UL 1715 for duration of 15 minutes by an accredited fire testing facility and satisfies the International Building Code (IBC) requirements.
 - 1. Alternative thermal barrier coating Intumescent Coating: Subject to compliance with requirements of Contract Documents, products which may be incorporated into the Work include, but are not limited to, the following. Use only intumescent coatings approved by the respective polyurethane insulation manufacturer.
 - a. JM No-Burn Plus ThB intumescent coating; manufactured by NO-BURN, Inc.
 - b. Fireshell TC intumescent coating; manufactured by TPR2
 - c. DC315; manufactured by National Fireproof, Inc.
 - 2. Ignition Barrier: When the insulation is installed within an attic space where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code. The ignition barrier may be an intumescent coating identified above. Products which may be incorporated into the Work include, but are not limited to, the following:

a. JM No-Burn Plus ThB intumescent coating; manufactured by NO-BURN, Inc.

3. JM Corbond III meets NFPA 286 criteria for various conditions and may be installed without a prescriptive ignition barrier in accordance with Sections 3.4.3.1, 3.4.3.2, 3.4.3.3 of IAPMO Evaluation Report 146.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions under which the air barrier assembly will be installed, with Installer present, for compliance with requirements.
 - 1. Verify that surfaces and conditions are suitable prior to commencing work of this section. Do not proceed with installation until unsatisfactory conditions have been corrected.
 - 2. Ensure that the following conditions are met:

- a. Surfaces are sound, dry, even, and free of oil, grease, dirt, excess mortar or other contaminants
- b. Concrete surfaces are cured and dry, smooth without large voids or sharp protrusions.
- c. Masonry joints are reasonably flush, and all excess mortar sitting on masonry ties has been removed.
- 3. Verify substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263 and take suitable measures until substrate passes moisture test.
- 4. Verify sealants are compatible with membrane proposed for use. Perform field peeladhesion test on materials to which sealants are adhered.
- 5. Notify Architect in writing of anticipated problems using closed-cell, medium density spray polyurethane foam over substrate prior to proceeding.

3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
 - 1. Ensure that penetrating work by other trades is in place and complete.
 - 2. Prepare surfaces by brushing, scrubbing, scraping, grinding or compressed air to remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants which will affect adhesion of the closed-cell, medium density spray polyurethane foam.
 - 3. Where there are release agents or other non-compatible coatings, wipe down metal surfaces to remove these release agents or other non-compatible coatings, using clean sponges or rags soaked in a solvent compatible with the spray polyurethane foam.
 - 4. Ensure veneer anchors are in place.
- B. Protection from Spray Applied Materials:
 - 1. Mask and cover adjacent areas to protect from overspray.
 - 2. Ensure any required foam stop or back up material are in place to prevent over spray and achieve complete seal.
 - 3. Seal off existing ventilation equipment. Install temporary ducting and fans to ensure exhaust fumes. Provide for make-up air.
 - 4. Erect barriers, isolate area and post warning signs to advise non-protected personnel to avoid the spray area.

3.3 INSTALLATION

- A. Spray Polyurethane Foam Installation: Install materials in accordance with manufacturer's recommendations, ULC S 705.2 and the following:
 - 1. Apply only after transition strip at foundation and wall intersection has been installed.
 - 2. Installer shall use proper personal protective equipment (PPE) during the installation of material in accordance with US Government regulation 29 CFR 1910.134.
 - 3. Warning signs shall be displayed and non-protected personnel shall be kept from the spray area in accordance with ULC S705.2.
 - 4. Equipment used to spray polyurethane foam shall comply with ULC S 705.2 and the manufacturer's recommendations for the specific type of application. Record equipment settings on the Daily Work Record as required by the ULC S 705.2 installation standard. Each proportioner unit shall supply only one spray gun.

- 5. Apply only when surfaces and environmental conditions are within limits prescribed by the material manufacturer or the ULC S 705.2 Installation standard.
- 6. Apply in consecutive passes as recommended by manufacturer to thickness as indicated on drawings. Passes shall be not less than 1/2 inch (12 mm) and not greater than 3.5 inches (75 mm). An additional pass shall only be done after the first pass has had time to cool down.
- 7. Install within manufacturer's tolerances, but not more than minus 1/4 inch (6 mm).
- 8. Do not install spray polyurethane foam within 3 inches (75 mm) of heat emitting devices such as light fixtures and chimneys.
- 9. Finished surface of foam insulation to be free of voids and embedded foreign objects.
- 10. Remove masking materials and over spray from adjacent areas immediately after foam surface has hardened. Ensure cleaning methods do not damage work performed by other sections.
- 11. Trim, as required, any excess thickness that would interfere with the application of cladding/covering system by other trades.
- 12. Clean and restore surfaces soiled or damaged by work of the section. Consult with section of work soiled before cleaning to ensure methods used will not damage the work.
- Complete connections to other components and repair any gaps, holes or other damage using material which conforms to ULC S 710.1 (single component) or ULC S 711.1 (two components) and installed in accordance with ULC S 710.2 or ULC S 711.2 as applicable.

3.4 FIELD QUALITY CONTROL

A. Owner's Inspection and Testing: Cooperate with Owner's testing agency. Allow access to work areas and staging. Notify Owner's testing agency in writing of schedule for Work of this Section to allow sufficient time for testing and inspection. Do not cover Work of this Section until testing and inspection is accepted.

3.5 **PROTECTING AND CLEANING**

- A. Protect material from damage during installation and the remainder of the construction period, according to manufacturer's written instructions.
 - 1. Coordinate with installation of materials which cover the air barrier assemblies, to ensure exposure period does not exceed that recommended by the manufacturer.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction and acceptable to the primary material manufacturer.

END OF SECTION

SECTION 07 27 00 – AIR BARRIERS

PART ONE - GENERAL:

1-01 **REQUIREMENTS**:

- A. The requirements of all sections of Division One apply to work under this section.
- B. Related Sections:

Section 3 – 03 30 00 Cast In Place Concrete Section 4 – 04 20 00 Masonry and Related Items and 04 72 00 Cast Stone Masonry Section 7 – 07 21 00 Bldg. Insulation, 07 31 13 Asphalt Shingles, and 07 46 46 Fiber Cement Siding. Section 8 – 08 11 13 Metal Doors and Frames and 08 41 13 Alum Storefront Section 9 – 09 29 00 Gypsum Drywall Section 21 – 21 13 00 Fire-Suppression Sprinkler System Section 22 – 22 05 00 General Plumbing Requirements Section 23 – 23 05 01 General HVAC Requirements Section 26 – 26 05 00 Electrical General Requirements

- **1-02 WORK INCLUDED:** Furnish labor and materials necessary to complete the installation of air barriers as noted on the drawings, specified or both.
- **1-03** <u>Locations</u>: All air barrier connections between: foundation and walls; walls and windows or doors; different wall systems; wall and roof; wall and roof over conditioned space or wall and ceiling under unconditioned space; walls, floors, and roof across construction, control, and expansion joints walls, floors, and roof to utility, pipe and duct penetrations.
- **1-04 Installation:** The air barrier material of each assembly detail shall provide an airtight and flexible joint between the air barrier and adjacent assemblies.

1-05 Testing:

- A. Air Barrier materials shall be tested in accordance with ASTM E2178-11 Standard Test Method for Air Permeance of Building Materials. Air permeability of individual materials shall not exceed 0.02 L/s-m2 under a pressure differential of 75 Pa (0.004 <u>cfm/ft2@0.3</u> in. w.g. (1.6 psf)). Materials shall meet this requirement when all joints are sealed.
- B. Air Barrier Assemblies shall be tested in accordance with ASTM E2357-11 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies, or ASTM E1677-11 Standard Specification for Air Barrier (AB) Material or System for Low-Rise Framed Building Walls, and determined that the average air leakage did not exceed 0.2 L/s.m2 under a pressure differential of 75 Pa (0.04 cfm/ft2 @ 0.3 in. w.g. (1.6 psf)). Concrete masonry walls that are sealed and painted do not have to eb tested. Assemblies meet this requirement when all joints are sealed.

End of Section

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SECTION 07410 - MANUFACTURED ROOF AND WALL PANELS

PART 1 - GENERAL

1.1 **RELATED DOCUMENTS**

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

1.2 <u>SUMMARY</u>

- A. This Section includes manufactured roof and wall panels of the following types:
- B. This Section includes manufactured roof panels of the following type:
 - 1. Formed roof panels with applied batten.
 - 2. Standing seam roof panels with lapped seam.
 - 3. Factory-assembled insulated roof panels with special seams.
 - 4. Standing seam roof panels to be machine seamed.
- C. This Section includes manufactured wall panels of the following type:
 - 1. Field-assembled wall panels with exposed fasteners.
 - 2. Field-assembled wall panels with concealed fasteners.
 - 3. Field-assembled insulated wall panels with concealed fasteners.
 - 4. Factory-assembled insulated wall panels with gasketed seams.
- D. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Division 5 Sections for structural and light gage framing.
 - 2. Division 7 Section "Insulation" for roof and/or wall insulation.
 - 3. Division 7 Section "Flashing and Sheet Metal" for roof and/or wall flashing and other sheet metal work.
 - 4. Division 7 Section "Joint Sealants" for field-applied panel sealants.
- E. Wood framing and decking are specified in a Division 6 section.
- F. Field-formed metal roofing is specified in Division 7 Section "Sheet Metal Roofing."

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide certified test results by a recognized testing laboratory or agency in accordance with specified test methods for each system.
- B. Air Infiltration: Provide roof panel system with no air leakage when tested in

accordance with ASTM E 283 at pressure differentials up to 1.57 psf.

- C. Air Infiltration: Provide wall panel systems with an air infiltration rate of not more than 0.06 cfm per sq. ft. of fixed wall area when tested in accordance with ASTM E 283 at a static air pressure differential of 1.57 psf.
- D. Water Penetration: Provide panel systems with no water penetration as defined in the test method when tested in accordance with ASTM E 331 at an inward static air pressure differential of not less than 6.24 psf and not more than 12.0 psf.

1.4 <u>SUBMITTALS</u>

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data including manufacturer's product specifications, standard details, certified product test results, installation instructions, and general recommendations, as applicable to materials and finishes for each component and for total panel system.
- C. Samples for initial selection purposes in form of manufacturer's color charts or chips showing full range of colors, textures, and patterns available for roof and wall panels with factory-applied finishes.
- D. Samples for verification purposes of roof and wall panels. Provide sample panels 12 inches long by actual panel width, in the profile, style, color, and texture indicated. Include clips, battens, fasteners, closures, and other panel accessories.
- E. Shop Drawings showing layouts of panels on walls and roofs, details of edge conditions, joints, corners, panel profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory and field assembly work.

1.5 **QUALITY ASSURANCE**

- A. Fire Resistance Rating: Provide panel systems that have been tested and listed by design no. in UL "Fire Resistance Directory" for 2-hr. assembly rating.
- B. Wind Uplift: Provide roof panel system including supports meeting requirements of Underwriters Laboratories, Inc. for Class 90 wind uplift resistance.
- C. Field Measurements: Where possible, prior to fabrication of panels, take field measurements of structure or substrates to receive panel system. Allow for trimming panel units where final dimensions cannot be established prior to fabrication.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver panels and other components so they will not be damaged or deformed. Package wall and roof panels for protection against transportation damage.
- B. Handling: Exercise care in unloading, storing, and erecting wall and roof covering panels to prevent bending, warping, twisting, and surface damage.
- C. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight ventilated covering. Store metal wall and roof panels so that they will not accumulate water. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.

1.7 <u>WARRANTY</u>

- A. Finish Warranty: Furnish panel manufacturer's written warranty covering failure of the factory-applied exterior finish on metal wall and roof panels within the warranty period. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.
 - 1. Warranty period for factory-applied exterior finishes on wall and roof panels is 20 years after the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 <u>MANUFACTURERS</u>

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering metal roof or wall panel systems that may be incorporated in the work include but are not limited to the following:
- B. Manufacturer: Subject to compliance with requirements, provide roof and wall panels by one of the following:
 - 1. Steel Roof and Wall Panels:
 - a. AEP-Span.
 - b. Allied Roof System.
 - c. Architectural Panels, Inc.
 - d. ASC Pacific, Inc.
 - e. Atas Aluminum Corp.
 - f. Berridge Manufacturing Co.
 - g. Butler Manufacturing Co.
 - h. Cheney Flashing Company.
 - i. ECI Building Components, Inc.
 - j. Fashion, Inc.
 - k. Flexospan.
 - I. Inryco Architectural Products.

- m. Metal Building Components, Inc. (MBCI).
- n. Merchant & Evans, Inc. ("Zip-Rib").
- o. Molenco.
- p. Morin Building Products Co., Inc.
- q. MM Systems Corp.
- r. Petersen Aluminum Corp.
- s. H.H. Robertson Company.
- t. E.G. Smith Construction Products, Inc.
- u. Steelite, Inc.
- v. Vincent Metals.
- w. Vin-Cor Steel Corp.
- 2. Aluminum Roof and Wall Panels:
 - a. AEP-Span.
 - b. Allied Roof System.
 - c. Architectural Panels, Inc.
 - d. Atas Aluminum Corp.
 - e. Cheney Flashing Company.
 - f. ECI Building Components, Inc.
 - g. Fashion, Inc.
 - h. Flexospan.
 - i. Merchant & Evans, Inc.
 - j. MM Systems Corp.
 - k. Petersen Aluminum Corp.
 - I. E.G. Smith Construction Products, Inc.
 - m. Vin-Cor Steel Corp.
- 3. Steel-Faced Factory-Assembled Insulated Panels:
 - a. AEP-Span.
 - a. Alply, Inc. (stainless).
 - b. Aluma Shield Industries, Inc.
 - c. Alumax Building Specialties Div.
 - d. Columbia Architectural Products, Inc. (CAP) (stainless).
 - e. ECI Building Components, Inc.
 - f. Inryco Architectural Products.
 - g. Insulated Panel Systems, Inc. (IPS).
 - h. Molenco.
 - i. Morin Building Products Co., Inc.
 - j. H.H. Robertson Company.
 - k. E.G. Smith Construction Products, Inc.
- 4. Aluminum-Faced Factory-Assembled Insulated Panels:
 - a. Alply, Inc.
 - b. Columbia Architectural Products, Inc. (CAP).
 - c. H.H. Robertson Company.

2.2 SHEET MATERIALS

- A. Structural Quality Galvanized Steel Sheet: Hot-dip zinc-coated steel sheet complying with ASTM A 446 with G90 coating complying with ASTM A 525, Grade C or to suit manufacturer's standards.
- B. Commercial Quality Galvanized Steel Sheet: Comply with ASTM A 526 with G90 coating complying with ASTM A 525.
- C. Structural Quality Aluminum-Zinc Alloy-Coated Steel Sheet: Hot-dip aluminum-zinc-coated steel sheet complying with ASTM A 792 with class AZ-50 coating; Grade 40 or to suit manufacturer's standards.
- D. Aluminum-Coated Steel Sheets: Comply with ASTM A 463 with T1-40 coating.
- E. Stainless Steel Sheet: Comply with ASTM A 240, Type 304 with no. 4 finish in accordance with ASTM A 480.
- F. Aluminum Sheets: Comply with ASTM B 209 for Alclad alloy 3003 or 3004 with temper as required to suit forming operations.
 - 1. Embossed: Provide sheet manufacturer's standard "stucco" embossed sheet finish.
 - 2. Cladding: Except as otherwise indicated, where aluminum sheets are exterior exposed without supplied coatings, provide special aluminum alloy-clad sheet known as "Alclad."

2.3 <u>METAL FINISHES</u>

- A. General: Apply coatings either before or after forming and fabricating panels, as required by coating process and as required for maximum coating performance capability. Protect coating either by application of strippable film or by packing plastic film or other suitable material between panels in a manner to properly protect the finish. Furnish air-drying spray finish in matching color for touch-up.
 - 1. Color: As indicated by reference to the manufacturer's standard color designations.
 - 2. Color: As selected by the Architect from the manufacturer's standard colors.
 - 3. Color: Match the Architect's sample.
- B. Fluoropolymer Coating: Manufacturer's standard two-coat, thermo-cured, full-strength 70 percent "Kynar 500" coating consisting of a primer and a minimum 0.75-mil dry film thickness with a total minimum dry film thickness of 0.9 mil and 30 percent reflective gloss when tested in accordance with ASTM D 523.
 - 1. Durability: Provide coating that has been field tested under normal range of weathering conditions for minimum of 20 years without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of

No. 8 in accordance with ASTM D 659; and without fading in excess of 5 NBS units.

- C. Siliconized Polyester Coating: Factory-applied baked-on coating consisting of epoxy primer and silicone-modified polyester enamel topcoat, with dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.
- D. Acrylic Enamel Coating: Factory-applied baked-on enamel coating consisting of epoxy primer and acrylic enamel topcoat with dry film thickness of not less than 0.2 mil for primer and 0.8 mil for topcoat.
- E. Factory Prime Coating: Where painting after installation is indicated (not work of this Section), provide pretreatment and factory-applied baked-on epoxy primer coat, min. 0.2-mil dry film thickness.

2.4 THERMAL INSULATION

- A. Polyisocyanurate Board Insulation: Unfaced, preformed, rigid, cellular, polyurethane thermal insulation complying with ASTM C 591, Type 2 with aged r-values of 6.2 at 75 deg F (23.9 deg C).
- B. Extruded Polystyrene Board Insulation: Rigid, cellular thermal insulation with closed cells and integral high-density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV, 1.6-psf minimum density, unless otherwise indicated.
- C. Molded Polystyrene Board Insulation: Rigid, cellular thermal insulation formed by the expansion of polystyrene resin beads or granules in a closed mold to comply with ASTM C 578, 0.9- to 1.35-psf density.
- D. Glass Fiberboard Insulation: Rigid or semirigid, noncombustible boards of glass fiber and resinous binders, k-value of 0.23, density of 3.0 pcf, that comply with ASTM C 612.
- E. Metal Building Insulation: Glass fiber blanket insulation, complying with ASTM C 991, of 0.5-pcf density, thickness as indicated, with UL flame spread classification of 25 or less, and 2-inch-wide continuous vapor-tight edge tabs.
 - 1. Facing: Vinyl-reinforced polyester.
 - 2. Facing: Vinyl-reinforced foil.
 - 3. Facing: Foil-reinforced kraft paper.
 - 4. Facing: Polypropylene-reinforced polyester.
 - 5. Retainer Strips: 26-gage (0.0179-inch) formed galvanized steel retainer clips colored to match the insulation facing.
- F. Mineral Fiber Blanket Insulation: Flexible, resilient, noncombustible blankets of mineral or glass fiber, complying with ASTM C 665.

- 1. Type I: Unfaced.
- 2. Type II: Faced one side with nonreflective vapor-retarder membrane.
- 3. Type III: Faced one side with reflective vapor-retarder membrane.
 - a. Class A: Membrane-faced surface with a flame spread of 25 or less.

2.5 <u>CORE MATERIAL</u>

- A. Honeycomb core slabs with maximum 1-inch hexagonal-shaped cells, thickness indicated.
 - 1. Kraft paper: Manufacturer's standard minimum 80 lb. per ream, minimum 16 percent resin-impregnated paper chemical fire retardant treated to provide flame spread not more than 15 and smoke developed not more than 250 when tested in accordance with ASTM E 84.
 - 2. Aluminum: Commercial grade, 0.003-inch-thick aluminum.
- B. Poured-in-Place Urethane: Modified isocyanurate foam with minimum 90 percent closed cell structure and the following characteristics:
 - 1. Density: 2.2 to 2.6 pcf.
 - 2. Compressive Strength: 20 psi minimum.
 - 3. Tensile Strength: 30 psi minimum.
 - 4. Humid Aging: 250 hours at 122 deg F, 100 percent humidity, 6 percent maximum increase.
 - 5. Heat Aging: 250 hours at 180 deg F, 100 percent humidity, 4 percent maximum increase.
- C. Thermal Insulation: Rigid or semirigid, boards of the following types specified in this Section:
 - 1. Polyisocyanurate (urethane).
 - 2. Extruded polystyrene.
 - 3. Molded polystyrene.
 - 4. Glass fiber (fiberglass).

2.6 MISCELLANEOUS MATERIALS

- A. Translucent Panels: Glass-fiber-reinforced polyester translucent plastic glazing panels complying with ASTM D 3841, Type CC1, limited flammability, Grade 2, weather resistant, crinkle finish both sides, weighing not less than 8 oz. per sq. ft. Match configuration of adjacent metal panels.
- B. Translucent Panels: Glass-fiber-reinforced polyester translucent plastic glazing panels complying with ASTM D 3841, Type CC2, general purpose, Grade 2, weather resistant, crinkle finish both sides, weighing not less than 8 oz. per sq. ft. Match configuration of adjacent metal panels.
 - 1. Color: White.
 - 2. Color: Green.
 - 3. Color: Tan.
 - 4. Color: Blue.

- 5. Mastic: Nonstaining saturated vinyl polymer as recommended by panel manufacturer for sealing laps.
- C. Laminated Backer Board: Hardboard that complies with ANSI A135.4, Class 1 tempered, 1/8 inch thick except as otherwise indicated.
- D. Gypsum Board: Type X fire rated, UL-labeled board of thicknesses indicated, complying with ASTM C 442 or ASTM C 36.
- E. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets, self-locking bolts, end-welded studs, and other suitable fasteners designed to withstand design loads.
 - 1. Use aluminum, corrosion-resistant steel, or stainless steel fasteners for Exterior application and galvanized or cadmium-plated fasteners for interior applications.
 - 2. Provide exposed fasteners with heads matching color of roof or wall panel by means of plastic caps or factory-applied coating.
 - 3. Provide metal-backed neoprene washers under heads of exposed fasteners bearing on weather side of panels.
 - 4. Locate and space exposed fasteners in true vertical and horizontal alignment. Use proper tools to obtain controlled uniform compression for positive seal without rupture of neoprene washer.
- F. Felts: Provide asphalt-saturated organic felts conforming to the requirements of ASTM D 226, Type II (No. 30).
- G. Accessories: Except as indicated as work of another specification section, provide components required for a complete roof or wall panel system, including trim, copings, fascias, gravel stops, mullions, sills, corner units, ridge closures, clips, seam covers, battens, flashings, gutters, louvers, sealants, gaskets, fillers, closure strips, and similar items. Match materials and finishes of panels.
 - 1. Closure Strips: Closed-cell, self-extinguishing, expanded cellular rubber or cross-linked polyolefin foam flexible closure strips. Cut or premold to match configuration of roof and wall panels. Provide closure strips where indicated or necessary to ensure weathertight construction.
 - 2. Sealing Tape: Pressure-sensitive 100 percent solids polyisobutylene compound sealing tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
 - 3. Joint Sealant: One-part elastomeric polyurethane, polysulfide, or silicone rubber sealant as recommended by the building manufacturer.
- H. Bituminous Coating: Cold-applied asphalt mastic, SSPC paint 12, compounded for 15 mil dry film thickness per coat.

2.7 PANEL FABRICATION

A. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as

required to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and dimensional requirements and with structural requirements.

- B. Sound Control: Where sound absorption requirement is indicated, fabricate interior liner panels with approximately 1,000 uniformly spaced 1/8-inch-diameter holes per sq. ft. Cover insulation with polyethylene film and provide inserts of wire mesh to form acoustical spacer grid.
- C. Apply bituminous coating or other permanent separation materials on concealed panel surfaces where panels would otherwise be in direct contact with substrate materials that are noncompatible or could result in corrosion or deterioration of either material or finishes.
- D. Fabricate panel joints with captive gaskets or separator strips, which provide a tight seal and prevent metal-to-metal contact in a manner that will minimize noise from movements within panel system.

2.8 ROOF AND WALL PANELS

- A. Face Sheets: Fabricate wall and roof panel face sheets to the profile or configuration indicated from 24-gage (0.0239-inch) zinc-coated or aluminum-zinc-coated steel sheets.
- B. Face Sheets: Fabricate wall and roof panel face sheets to the profile or configuration indicated from 24-gage (0.0239-inch), drawing quality, aluminum-coated steel sheets.
- C. Face Sheets: Fabricate wall and roof panel face sheets to the profile or configuration indicated from 16-gage (0.0598-inch) stainless steel sheets.
- D. Face Sheets: Fabricate wall and roof panel face sheets to the profile or configuration indicated from 0.040-inch-thick 3003 or 3004 Alclad alloy stucco embossed finish aluminum sheets.
- E. Insulated Wall Panels: Fabricate wall panels in a manner that will eliminate condensate on the interior side. Design joints between panels to form weathertight seals. Insulating core of panels shall provide "U"-factor indicated.
 - 1. Provide field-assembled wall panel units consisting of an insulating material between metal interior and exterior face sheets. Securely fasten units together with rivets, bolts, studs, "snap-on," or other approved methods of fastening, including interlocking with basic wall units.
 - 2. Provide factory-assembled wall panel units consisting of a specified core material laminated or otherwise securely bonded to metal interior and exterior face sheets.
- F. Lap-Seam Roof Panels: Manufacturer's standard factory-formed lap-seam roof panel system designed for mechanical attachment of panels to roof purlin using

exposed fasteners and sealants. Form panels of 24-gage (0.0239-inch) zinc-coated or aluminum-zinc-coated steel sheets.

- G. Standing Seam Roof Panels: Manufacturer's standard factory-formed standing-seam roof panel system designed for mechanical attachment of panels to roof purlin using a concealed clip. Form panels of 24-gage (0.0239-inch) zinc-coated or aluminum-zinc-coated steel sheets.
 - 1. Clips: Provide 16-gage (0.0598-inch) panel clips designed to meet negative load requirements.
 - 2. Cleats: Factory-calked, mechanically seamed cleats formed from 24-gage (0.0239-inch), Grade C, zinc-coated steel sheets.

2.9 PANEL SUPPORTS AND ANCHORAGE

- A. Secondary Framing: Provide the following secondary framing members:
 - Roof Purlin and Wall Girts: "C"- or "Z"-shaped sections fabricated from 16-gage (0.0598-inch) shop-painted, roll-formed steel. Purlin spacers shall be fabricated from 14-gage (0.0747-inch) cold-formed galvanized steel sections.
 - 2. Eave Struts: Unequal flange "C"-shaped sections formed to provide adequate backup for both wall and roof panels. Fabricate from 16-gage (0.0598-inch) shop-painted, roll-formed steel.
 - 3. Flange and Sag Bracing: 1-5/8- by 1-5/8-inch angles fabricated from 16-gage (0.0598-inch) shop-painted, roll-formed steel.
 - 4. Base or Sill Angles: Fabricate from 14-gage (0.0747-inch) cold-formed galvanized steel sections.
 - 5. Secondary structural members, except columns and beams, shall be the manufacturer's standard sections fabricated from 14-gage (0.0747-inch) cold-formed galvanized steel.

PART 3 - EXECUTION

3.1 PANEL SUPPORTS AND ANCHORAGE

A. Girts, purlin, and other secondary structural panel support members and anchorage shall be installed in accordance with AISC Manual of Steel Construction "Code of Standard Practice."

3.2 PANEL INSTALLATION

- A. General: Comply with manufacturers' instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal and structural movement.
 - 1. Field cutting of exterior panels by torch is not permitted.
 - 2. Install panels with concealed fasteners.

- 3. Install panels with exposed exterior and interior fasteners, prefinished to match panel finishes.
- 4. Install roof panels over minimum 3:12 pitch solid substrate with one ply of felt installed from lower edge up with at least 3-inch side laps and 4-inch end laps.
- B. Accessories: Install components required for a complete roof or wall panel system, including trim, copings, fascias, gravel stops, mullions, sills, corner units, ridge closures, clips, seam covers, battens, flashings, gutters, louvers, sealants, gaskets, fillers, closure strips, and similar items.
- C. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets, sealants, and fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer.
 - 1. Provide weatherseal under ridge cap. Flash and seal roof panels at eave and rake with rubber, neoprene, or other closures to exclude weather.
 - 2. Refer to other sections of these specifications for product and installation requirements applicable to indicated joint sealers.
- D. Joint Sealers: Refer to other sections of these specifications for post-installation requirements on joint sealers; not work of this section.
- E. Lap-Seam Roof Panels: Provide sealant tape at lapped joints of ribbed or fluted roof sheets and between roof sheets and protruding equipment, vents, and accessories.
 - 1. Apply a continuous ribbon of sealant tape to clean, dry surface of the weather side of fastenings on end laps, and on side laps of corrugated nesting-type, ribbed, or fluted panels and elsewhere as needed to make roof sheets weatherproof to driving rains.
- F. Standing Seam Roof Panel System: Fasten roof panels to supports with concealed clip in accordance with the manufacturer's instructions.
 - 1. Install clips at each support with self-drilling/self-tapping fasteners.
 - 2. At end laps of panels, install tape caulk between panels.
 - 3. Install factory-calked cleats at standing-seam joints. Apply snap-on batten to the panels to provide a weathertight joint.
 - 4. Seaming: Complete seaming of panel joints by operation of portable power-driven equipment of type recommended by panel manufacturer to provide a weathertight joint.
- G. Wall Panels: Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete and elsewhere as necessary for waterproofing. Handle and apply sealant and backup in accordance with the sealant manufacturer's recommendations.
 - 1. Align bottom of wall panels and fasten panels with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.

- 2. Install screw fasteners with power tools having controlled torque adjusted to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
- 3. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
- H. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4 inch in 20'-0" on level/plumb/slope and location/line as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.3 CLEANING AND PROTECTION

- A. Damaged Units: Replace panels and other components of the work that have been damaged or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures.
- B. Cleaning: Remove temporary protective coverings and strippable films (if any) as soon as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction.

END OF SECTION 07 41 00

SECTION 07 46 46 - FIBER CEMENT SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Siding panels.
- B. Soffit panels.
- C. Accessories and trim.

1.2 RELATED SECTIONS

- A. Section 06 10 00 Rough Carpentry: Framing and Sheathing.
- B. Section 07 92 00 Joint Sealers.
- C. Section 09 91 00 Paints and Coatings: Field painting.

1.3 <u>REFERENCES</u>

- A. ASTM C 920 Standard Specification for Elastomeric Joint Sealants; 1998.
- B. ASTM C 1185 Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards; 1999.
- C. ASTM C 1186 Standard Specification for Flat Non-Asbestos Fiber Cement Sheets; 1999.
- D. ASTM E 72 Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 1998.
- E. ASTM E 84 -- Standard Test Method for Surface Burning Characteristics of Building Materials; 1999.
- F. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials; 1995.
- G. ASTM E 136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 1999.

- H. ASTM E 228 Standard Test Method for Linear Thermal Expansion of Solid Materials With a Vitreous Silica Dilatometer; 1995.
- I. ASTM G 26 Standard Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials; 1996.
- J. ASTM E 330-97 Structural Performance of exterior windows, curtain walls and doors by uniform static air pressure difference.

1.4 SUBMITTALS

- A. Make submittals under provisions of Section 01 33 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods, including nailing patterns.
 - 4. Applicable model code authority evaluation report (ICC, CCMC, etc.)
- A. GREEN GLOBES Submittals: Provide documentation of how the requirements of Credit will be met:
 - 1. List of proposed materials with recycled content. Indicate postconsumer recycled content and pre-consumer recycled content for each product having recycled content.
 - 2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
 - 3. List of proposed materials with rapidly renewing content. Indicate rapidly renewing content percentage for each product having rapidly renewing content.
- B. Siding manufacturer's requirements for vapor retarders, primer, paint, etc., to be installed by others.
- C. Maintenance and periodic inspection recommendations.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Provide installer with not less than three years of experience with products similar to those specified.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products off the ground, on a flat surface, and under a roof or separate waterproof covering.

1.7 WARRANTY

- A. Provide WeatherBoards 50 year limited siding warranty.
- B. CertainTeed ColorMax Finish provide 15 year limited paint warranty
- C. Register manufacturer's warranty, made out in Owner's name, with copy to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. CertainTeed Corporation, Siding Products Group, P.O. Box 860, Valley Forge, Pennsylvania 19482. ASD. Tel: (800) 233-8990 (professional) or (800) 782-8777 (consumer). www.certainteed.com.
- B. Substitutions: GAF, Chemplank, Hardiplank or approved equal.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 25 13.

2.2 PANELS

- A. Fiber Cement Board Panels General: CertainTeed Fiber Cement Board Panels consist of cement, recycled content and cellulose fiber formed under high pressure into boards with integral surface texture; complying with ASTM C 1186 Type A Grade II; machined edges; for nail attachment.
 - 1. Surface Burning Characteristics: Flame spread index of 0, smoke developed index of 5, maximum; when tested in accordance with ASTM E 84 (Class I/A).
 - 2. Flammability: Noncombustible, when tested in accordance with ASTM E 136.
 - 3. Flexural Strength: At least 1450 psi (10 MPa) when in equilibrium condition, and at least 1015 psi (7 MPa) when in wet condition, tested in accordance with ASTM C 1185.
 - Coefficient of Thermal Expansion: Less than 1 x 10⁻-5/inch/inch/degree F (0.5 x 10⁻-5/degree C), when tested in accordance with ASTM E 228.

- 5. Freeze Thaw Resistance: At least 80 percent flexural strength retained, when tested in accordance with ASTM C 1185.
- 6. UV Resistance: No cracking, checking, or erosion, when tested for 2000 hours in accordance with ASTM G 26.
- 7. Water Tightness: No water droplets on underside, when tested in accordance with ASTM C 1185.
- B. Horizontal Siding: CertainTeed WeatherBoards Lap Siding.
 - 1. Thickness: 5/16 inch (7.9 mm), plus or minus .04 inch (1 mm).
 - 2. Length: 12 feet (3657 mm), plus 0, minus 1/8 inch (3 mm).
 - 3. Style: Cedar lap siding.
 - a. Width: 8 inches (185 mm) wide.
 - 4. Sealant/Primer: FiberTect Sealant/Primer.
 - 5. Factory Finish: Factory applied ColorMax Finishing System by CertainTeed with 100 percent acrylic solid color as selected by architect:
- C. Simulated Shingle Siding: CertainTeed WeatherBoards Shakes.
 - 1. Thickness: 5/16 inch (7.9 mm), plus or minus .04 inch (1 mm).
 - 2. Style: Random square staggered edge, cut between shingles, 7 inches (178 mm) exposure, 16 inches (406 mm) wide by 48 inches (1219 mm) long.
 - 3. Sealant/Primer: FiberTect Sealant/Primer.

Factory Finish: Factory applied ColorMax Finishing System by CertainTeed with 100 percent acrylic solid color as selected by architect.

- D. Soffit: CertainTeed WeatherBoards Soffit, ventilated and non-ventilated.
 - 1. Thickness: 1/4 inch (6.35 mm), plus or minus 1/32 inch (0.8 mm).
 - 2. Style: Smooth texture, 12 inches (305 mm) wide.
 - 3. Ventilated soffit.
 - 4. Non-ventilated soffit.
 - 5. Combination of Ventilated and Non-ventilated as indicated on the Drawings.
 - 6. Sealant/Primer: FiberTect Sealant/Primer.
 - 7. Factory Finish: Factory applied ColorMax Finishing System by CertainTeed with 100 percent acrylic solid color as selected by architect.
- E. Soffit/Porch Panel: CertainTeed FiberCement Soffit/Porch Panel.
 - 1. Thickness: 1/4 inch (6 mm), (6.35 mm, plus or minus 0.8 mm).
 - 2. Width: 48 inches (1220 mm).
 - 3. Length: 8 feet (2440 mm), plus 0, minus 1/8 inch (3.17 mm).
 - 4. Sealant/Primer: FiberTect Sealant/Primer.

5. Factory Finish: Factory applied ColorMax Finishing System by CertainTeed with 100 percent acrylic solid color as selected by architect.

2.3 ACCESSORIES

- A. Trim: CertainTeed WeatherBoards Trim
 - 1. Size:
 - a. Thickness 7/16 inch (11 mm) plus or minus (1 mm).
 - b. Width:
 - 1) 3-1/2 inch (89 mm).
 - 2) 5-1/2 inch (140 mm).
 - 3) 7-1/4 inch (185 mm).
 - 4) 9-1/4 inch (235 mm).
 - 5) 11-1/4 inch (286 mm).
 - c. Length: 12 feet (3.657 m) plus or minus 1/8 inch (3.17 mm).
 - 2. Sealant/Primer: FiberTect Sealant/Primer.
- B. Provide the following trim:
 - 1. Starter strip for lap siding.
 - 2. Outside corners, butted to siding.
 - 3. Fascia board.
- C. Sealant: Paintable, 100 percent acrylic latex caulk complying with ASTM C 920.
- D. Sheet Metal Flashing: Minimum 26 gauge hot-dipped galvanized steel sheet, or coated aluminum.
- E. Nails: Length as required to penetrate minimum 1-1/4 inch (32mm) into solid backing; hot-dipped galvanized or stainless steel.
- F. Building Paper: Kraft or bituminous paper; not polyethylene or foil.
- G. Field Finish Paint: 100 percent acrylic latex as specified in Section 09900.
- H. Touch Up Kit: Provide CertainTeed Color Max touch-up kit for each color provided.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Prior to commencing installation, verify governing dimensions of building and condition of substrate.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Examine, clean, and repair as necessary any substrate conditions that would be detrimental to proper installation.
- B. Do not begin installation until unacceptable conditions have been corrected.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and Drawing details.
 - 1. Read warranty and comply with all terms necessary to maintain warranty coverage.
 - 2. Install in accordance with conditions stated in model code evaluation report applicable to location of project.
 - 3. Use trim details indicated on drawings.
 - 4. Touch up all field cut edges before installing.
 - 5. Pre-drill nail holes if necessary to prevent breakage.
- B. Over Wood Studs Without Sheathing: Install building paper over studs prior to installing siding.
- C. Over Wood and Wood-Composite Sheathing: Fasten siding through sheathing into studs.
- D. Over Foam Sheathing: Read and comply with sheathing manufacturer's recommendations.
 - 1. For sheathing of 1 inch (25 mm) thickness or less, nail through sheathing into studs using correspondingly longer nails.
- E. Over Masonry Walls: Install furring strips of adequate thickness to accept full length of nails and spaced at 16 inches (406 mm) on center.

- F. Over Steel Studs: Minimum 20 gauge steel, 3 5/8" (92 mm) C-studs. Use 1-5/8" (41 mm) long, #8-18 x 3/8" HD self-tapping, corrosion-resistant ribbed bugle head screws. Attach siding at each stud insuring that at least 3 screw threads penetrate the studs.
- G. Diagonal Siding: Follow manufacturer's instructions.
- H. Allow space between both ends of siding panels that butt against trim for thermal movement; seal joint between panel and trim with exterior grade sealant.
- I. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses.
- J. Joints in Vertical Siding: Install Z-flashing in horizontal joints between successive courses of vertical siding.
- K. Furred Installation: Leave space at top and bottom open; top may be behind soffit; at bottom install insect screen over opening by wrapping a strip of screen over bottom ends of vertical furring strips.
- L. Install sheet metal flashing above door and window casings and horizontal trim in field of siding.
- M. Do not install siding less than 6 inches (150 mm) from surface of ground nor closer than 1 inch (25 mm) to roofs, patios, porches, and other surfaces where water may collect.
- N. After installation, seal all joints except lap joints of lap siding. Seal around all penetrations. Paint all exposed cut edges.
- O. Finish Painting: Specified in Section 09 91 00.
- P. Finish Painting: Within 24 months after installation, paint siding and trim with one coat finish paint.
- Q. Finish Painting: Within 24 months after installation, paint siding and trim with one coat primer and two coats finish paint.

3.4 CLEANING

- A. At completion of work, remove debris caused by siding installation from project site.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 62 00 - SHEETMETAL, FLASHING AND TRIM

PART ONE - GENERAL:

- **1-01** <u>**GENERAL:**</u> The requirements of all sections of Division One apply to work under this section.
- **1-02 WORK INCLUDED:** Furnish labor and materials necessary to complete related roofing items indicated, specified or both.

PART TWO - PRODUCTS:

- 2-01 <u>SUSPENDED ALUMINUM CANOPIES:</u> Furnish and install where indicated on the drawings, pre-finished aluminum self-guttering canopies complete with turn buckles. Drain holes to be coordinated with the Architect prior to cutting. Color to be selected by the Architect.
- **2-02 PRE-FINISHED METAL WORK:** All pre-finished metal work shall be as manufactured by Cheney Flashing Company, or approved equal. Material shall be aluminum alloy .040 thick pre-finished with fluropon full strength Kynar 500 flurocarbon coating. Color of metal shall be selected by the Architect from sixteen standard colors.
- **2-03** <u>**MISCELLANEOUS PRE-FINISH METAL:**</u> Metal for gutters, downspouts, copings, gravel stops, caps, corners, drips, counter flashings, built-in receives and pipe support umbrella cones, etc., shall be sheet aluminum STM B 209, Alloy 3003 Temper H14 with anodized finish 0.032" thick (20 gage). Submit shop drawings showing layout, jointing, profiles and anchorages of major counter flashings, gutters, downspouts, scuppers and expansion joint systems. Install in strict accordance with printed instructions. Installation shall be per SMACNA Architectural Sheet Metal Manual. Provide a 5 year written guarantee on labor and 10 year on materials for all such work. All metal trim associated with the metal roofing system, i.e. ridge cap, rake flashing, hip flashing, valley, roof-to-wall, etc. shall be the same material finish and color as the metal panels. Materials shall be a minimum 26-gage conforming to the requirements of ASTM A-446 Grade "D." Minimum yield stress shall be 50,000 psi.
- **2-04** <u>**GUTTER SUPPORTS:**</u> Furnish and install extra heavy gutter supports 4'0" o.c. fabricated from 1/4" steel and painted. See roof plan sheet in drawings and building elevations.
- **2-05** <u>**REGLET:**</u> The roofing contractor shall furnish to the masonry contractor copper reglets for installation in the masonry work to accommodate flashing in all of the masonry walls. See architectural plans for details.

- **2-06 <u>GUTTER AND DOWNSPOUT:</u>** All gutters and downspouts shall be fabricated from 1/16" thick pre-finished aluminum as detailed on architectural drawings. Color to be selected by Architect from sixteen standard colors. To match existing.
- **2-07 FLEXIBLE WALL FLASHING:** Flexible wall flashing shall be AFCO copper flashing as manufactured by AFCO Products, Inc., 3 oz. copper wt. per sq. ft. with fiberglass fabric each side of copper core or approved equal. Place wall tie above and below flashing in same mortar joint at through-wall applications.
- **2-08 <u>QUALITY ASSURANCE:</u>** The manufacturer's qualifications: The roof system manufacturer shall meet and provide written certification stating:
 - (1) The manufacturer has been regularly engaged in the fabrication of metal standing seam roof systems for at least ten (10) years and is an American owned company.
 - (2) The manufacturer is a member of the Metal Building Manufacturers Association (MBMA).
 - (3) The manufacturer is certified by the American Institute of Steel Construction (AISC).
 - (4) The manufacturer maintains a certified installer program for its product.

Installer's qualifications:

(1) The installation of the standing seam system and roof-related accessories shall be performed by roofers. Certified Preferred and Authorized by the manufacturer as trained and qualified to erect the manufacturer's product.

End of Section

SECTION 07 81 00 - APPLIED ELASTOMERIC SPRAY FIREPROOFING

PART 1 GENERAL

1-01 QUALITY ASSURANCE

- (A) The material and installation shall conform to the applicable local building code requirements and all authorities having jurisdiction.
- (B) Installer of sprayed on fireproofing: A firm licensed or otherwise approved by manufacturer of primary fireproofing materials, including qualified factory training where recommended by manufacturer.
- (C) Fire-Endurance Ratings: Provide products which have been tested in accordance with ASTM E119, E84, and ASTM E814 for fire resistance, and rated by UL or other industry-recognized agency for the required resistances.
- (D) Fire-spread ratings: Provide products which have been tested and listed by UL for required surface burning characteristics (flame-spread, fuel contributed, smoke developed) in accordance with ASTM E84.
 - 1. General Rating A: Except as otherwise indicated, provide completed installations including coatings (if any) rated at a maximum flame-spread of five (5).
 - 2. Roof Deck Rating: Where applied on underside of metal roof decking, provide fireproofing approved by FM for Class I construction.
- (E) SPECIAL NOTE: All firestopping and firespray noted in Section 078100 & 078400 shall be by one manufacturer and installed by single source for all trades.

1-02 SUBMITTALS

- (A) Product data: Submit manufacturer's product specifications and installation instructions for each type of material and application method required.
- (B) Certified Tests:
 - 1. With product data submit certified test reports on performances including (as applicable) burning characteristics, densities, compressive strengths, bond strengths, hardness, water absorption, thermal insulating values, acoustical ratings (NRC) and corrosion resistance.
 - 2. Test reports: Submit laboratory tests reports on each required test of in-place fireproofing, including location and date of samples as tested, and laboratory's interpretation of test data.
- (C) Certification:
 - 1. Furnish certificates in triplicate, including complete report and test record if required, attesting that fire protection material and installation method meet specified test procedures, fire hazard classification and fire resistance rating. Certificates shall also list thickness and density of material proposed for use.
 - 2. After certificates, reports and test records have been submitted and accepted, these submissions cannot be changed unless all aspects of the change are agreed to by the architect.
 - 3. Letter from testing laboratories summarizing a test or engineering studies shall be accepted as meeting the requirements for submission.

1-03 DELIVERY, STORAGE AND HANDLING: Materials shall contain no asbestos and shall be packaged as recommended by manufacturer, properly marked and labeled to show manufacturer's name, brand and certification of compliance with requirements for fire hazard and fire resistance classifications of Underwriters Laboratories. Damaged packages found unsuitable for use will be rejected and shall be removed from job site.

1-04 PROJECT CONDITIONS

- (A) All exterior openings in areas to be sprayed shall be covered during application with tarpaulins or similar closures.
- (B) The surfaces to which fire protection material is to be applied as well as the ambient temperature during application shall be minimum of 40 degrees F. and 24 hours after application shall not fall below 40 degrees F. Relative humidity shall be low enough to assure proper drying of the applied material.
- (C) Sequence and Coordination: Integrate the scheduling and coordination of fireproofing work with other units of work so that it will not be exposed to weather and other damaging ambient conditions, will not be unnecessarily exposed to abrasion and other damage likely to occur during subsequent work, will be installed prior to installation of enclosing or concealing work, will provide time allowance for inspection, testing and subsequent correction of defective fireproofing, and will minimize time other work to be protected by fireproofing is exposed to possible fire hazards.

1-05 WARRANTY

- (A) Special Project Warranty: Submit written warranty, executed by contractor and cosigned by installer, agreeing to repair or replace fireproofing work of this section, which has cracked, flaked, dusted excessively, peeled or fallen from substrate or otherwise deteriorated to a condition where it would not perform effectively as intended for fireproofing purposes; due substantially to defective materials or workmanship and not due to abuse by occupants, improper maintenance, non-foreseeable ambient exposures, or other causes beyond anticipated conditions and contractor's and installer's control.
- (B) Warranty period is ten years after date of substantial completion.

PART 2 PRODUCTS

2-01 MANUFACTURER

- (A) The sprayed fireproofing material shall be asbestos-free Elastomeric latex base sprayapplied coating or sealant as manufactured by SpecSeal or approved equal.
- (B) Other acceptable manufacturers include:
 - 1. Isolatek International Corporation
 - 2. Air-O-Therm Application Co., Inc.; Elk Grove Village, IL
 - 3. American Energy Products Corp., Edison, NJ
 - 4. Conwed Corp, St. Paul, MN
 - 5. Grace Construction Products, (866) 333-3726

END OF SECTION

SECTION 07 84 00 - FIRESTOPPING AND SMOKESTOPPING

PART 1 – GENERAL

1.1 <u>SCOPE OF WORK:</u>

- A. General:
 - 1. Furnish all labor, materials, tools and equipment and perform all operations in connection with the installation of firestopping and smokestopping systems required to seal off all voids or gaps at interfaces of Division 22, Division 23 and 07 81 00 equipment, piping, conduits, sleeves, and other penetrations at walls, roofs, slabs, and similar assemblies.
- B. Descriptions:
 - 1. Firestop all existing openings in walls, roofs, slabs and similar assemblies remaining as a result of removing existing pipes, equipment, and appurtenances.
 - 2. Firestop all new openings in walls, roofs, slabs, and similar assemblies at pipe, equipment, and appurtenances.
 - 3. Smokestop all new openings in smoke barriers, smoke partitions and smoke tight walls.

1.2 **RELATED DOCUMENTS**:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. All sections of Divisions 22 & 23 Specifications apply to this section.
- C. Special Note: All fire stopping and spray fire-proofing shall be by one manufacturer and installed by single source.

1.3 QUALITY ASSURANCE:

- A. Codes and Standards:
 - 1. All work shall meet or exceed the standards and procedures (latest editions) of the following:
 - a. ASTM E814, Standard Method of Fire Tests of Through-Penetration Firestop Systems
 - b. UL 1479, Through-Penetration Firestop Systems
 - c. ASTM E-119
 - d. ASTM E-814
 - e. ASTM E-2174

- B. Manufacturer:
 - 1. The following firestopping sealant manufacturers are acceptable:
 - a. Nelson
 - b. Dow Corning
 - c. Thomas & Betts
 - d. 3M
 - e. Hilti
 - f. GE
 - g. Fyre Putty
 - h. W.R. Grace
 - 2. The following smokestopping manufacturers are acceptable:
 - a. Nelson
 - b. Dow Corning
 - c. Thomas & Betts
 - d. 3M

PART 2 - PRODUCTS

2.1 <u>GENERAL:</u>

- A. Firestopping and smokestopping materials shall be delivered to the job site ready to install and require no critical mixing procedures or precise installation time constraints.
- B. Materials shall be delivered to the site in sealed containers, fully identified with manufacturer's name, brand, type, grade and U.L. and FM labels. Store materials in a dry space under cover and off the ground.
- C. Materials shall not contain flammable solvents.
- D. Refer to architectural drawings for fire ratings of walls and slabs. All floor slabs and chases shall be 2 hour rated minimum unless noted otherwise. All corridor walls shall be 1 hour rated minimum unless noted otherwise.
- E. Refer to architectural drawings for smoke barriers, smoke walls, and smoke tight partitions. If no other requirements are indicated, corridor walls extending to the structure above shall be smokestopped.

2.2 THROUGH FIRESTOP PENETRATION:

- A. General:
 - 1. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items penetrating the firestopping.
 - 2. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer.

- 3. Provide a firestop system with an "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
- B. Cast-in Place Devices:
 - 1. The cast-in place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors shall be:
 - a. Hilti CP 680 Cast-In Place Firestop Device
 - 1) Add Aerator adapter when used in conjunction with "Sovent" single stack DWV systems.
 - b. Hilti CP 681 Tub Box Kit for use with tub installations.
- C. Materials for Metallic Pipes and Conduits:
 - 1. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT) shall be:
 - a. Hilti FS-ONE Intumescent Firestop Sealant
 - b. Hilti CP 604 Self-leveling Firestop Sealant
 - c. Hilti CP 620 Fire Foam
 - d. Hilti CP 606 Flexible Firestop Sealant
 - e. Hilti CP 601s Elastomeric Firestop Sealant
- D. Materials for Non-Metallic Pipes and Insulated Pipe:
 - 1. The Intumescent sealants, caulking materials for use with combustible items including insulated metal pipe and plastic pipe shall be:
 - a. Hilti FS-ONE Intumescent Firestop Sealant
- E. Materials for Non-Metallic Combustible Pipes:
 - 1. The firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), shall be:
 - a. Hilti CP 642 Firestop Collar
 - b. Hilti CP 643 Firestop Collar
 - c. Hilti CP 645 Wrap Strips

2.3 <u>SMOKESTOPPING:</u>

- A. Smokestop shall provide an effective barrier against the spread of smoke.
- B. Sealants on inside of ducts shall not experience significant shrinkage or expansion from 0° to 2000° F.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. All installations shall be in accordance with the manufacturer's recommendations for the specific UL assembly which is to be firestopped.

B. Protect other surfaces and equipment from being damaged by the application or overspray of firestopping compound. Remove excess and spillage promptly.

3.2 PREPARATION:

- A. Clean and prepare substrates for materials in accordance with manufacturer's recommendations.
- B. Openings larger than required for proper installation of pipe or duct shall be patched or repaired.

3.3 <u>FIELD TESTING:</u>

- A. Contractor shall remove up to (5%) (10%) of firestop assemblies when requested by Building Official or Engineer. If assemblies are not installed in accordance with UL THROUGH PENETRATION FIRESTOP SYSTEMS, additional assemblies may be removed at the discretion of the Engineer.
- B. Upon removal of assemblies by the Building Official or A/E, the Contractor shall refirestop all affected penetrations.

3.4 **IDENTIFICATION:**

- A. Identify through-penetration firestop systems with pressure-sensitive, selfadhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:
 - 1. The words: "Warning—Through-Penetration Firestop System—Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Through-penetration firestop system designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Through-penetration firestop system manufacturer's name.
 - 6. Installer's name.
- B. Labels shall be located as close as practical to the penetration. In occupied spaces, the labels shall be above the ceilings where ceilings are installed.
- C.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART ONE - GENERAL:

- **1-01 <u>REQUIREMENTS</u>: The requirements of all sections of Division One apply to work under this section.</u>**
- **1-02 WORK INCLUDED:** Furnish labor and materials for both interior and exterior where indicated or required to make the structure weather and water tight.
- **1-03 INSTALLATION:** Installation of joint sealants shall be as per Industry Best Practice.

PART TWO - PRODUCTS:

- **2-01** <u>MATERIALS:</u> Materials shall be as manufactured by Pecora Corp., DAP Architectural sealants or approved equal.
 - A. Caulking for exterior vertical surfaces and interior moving joints shall be "Dynotrol 1" (Type II) FS TT-230C and ASTM C920.
 - B. Caulking for exterior horizontal surfaces shall be "Urexpan NR-201" FS TT-2-230C and ASTM C920-D1850.
 - C. Caulking for interior non-moving joints shall be Pecora Corp. or approved equal "AC+20+Silicone" ASTM C834-86.
 - D. Caulking for interior acoustical applications "Ag-20FTR" ASTM C834-86.
 - E. Caulking for sealing fire and smoke partition penetrations shall be UL approved expandable fill caulking.
 - F. Deliver, store, handle materials to prevent inclusion of foreign materials, damage of materials by water, breakage. Deliver packaged materials in original packages until ready for use.

PART THREE - EXECUTION:

3-01 **PREPARATION**:

A. Pack, caulk and sealant joints to within 3/8" of the surface unless otherwise noted.
- B. Clean metal surfaces free of grease, oil, wax, lacquer, and other foreign residue with a suitable solvent. Scrape or brush masonry surfaces clean. Where used in contact with copings or light colored brick, use compound free of phenolic resins and non-staining.
- **3-02 APPLICATION:** Apply compounds with pressure flow gun having a nozzle of the proper size and shape to suit width of joint and with sufficient pressure to fill joint. Apply as a continuous operation horizontally in one direction and vertically from bottom to top. Joints having excessive widths where caulking might sag should be built-up with successive beads. Finish joints smooth and slightly recessed. Remove excess compound. Immediately clean adjacent surfaces which have been soiled, leave work neat and clean.
- **3-03 LOCATIONS:** Seal all interior and exterior openings, joints and penetrations with the appropriate afore described material. Do not rely on drawing notes to cover all situations.

End of Section

DIVISION NO. 8 - DOORS, WINDOWS AND GLASS

SECTION 08 11 13 - METAL DOORS AND FRAMES

PART ONE - GENERAL:

- **1-01 <u>REQUIREMENTS</u>:** The requirements of all sections of Division One apply to work under this section.
- **1-02 WORK INCLUDED:** Furnish labor and materials necessary to complete hollow metal doors and frames indicated, specified or both. Coordinate doors and frames with security system from electrical drawings.
- **1-03 SHOP DRAWINGS:** The Contractor shall submit four (4) copies of Checked shop drawings for approval by the Architect. These drawings shall detail each type frame, door, anchorage detail and schedule.
- **1-04 <u>COMPLIANCE:</u>** Hollow metal work to comply with ANSI/SDI-100 "Recommended Specifications For Standard Steel Doors and Frames" and SDI-105 "Recommended Erection Instructions For Steel Frames" and NFPA #80. Installation shall meet ASTM E2112 (latest version) or CMHC Flashings: Best Practices Guide.

PART TWO - PRODUCTS AND EXECUTION:

2-01 HOLLOW METAL DOORS:

- A. Doors shall be CECO or approved equal.
- B. Doors shall be made of 16 gauge roller leveled prime quality cold rolled steel sheets. Vertical stiffeners shall be No. 16 gauge channel shaped steel on nominal 6" spaces, welded to both face sheets on 5" centers. Doors shall have continuous face welds each side.
- C. Top and bottom channels shall be No. 14 gauge steel inverted channels. The Vertical edge channels shall be No. 14 gauge. The vertical edge joint between the face sheets shall be continuously welded together and to the vertical edge channels. This joint shall be ground smooth to provide a complete flush door with no exposed seams.
- D. All doors shall be filled with spun material insulation.
- E. Doors with glass light opening shall have the openings formed into the face sheets so that no glass frame is required. Glazing beads shall be recessed behind the formed openings in the face sheets beveled, and attached without screws.

Glazing bead corners shall present a mitered appearance.

- F. The tops of all exterior doors shall be closed flush to prevent accumulation of moisture and rain water.
- G. If rated doors are indicated, provide labeled door. Protect label from paint.
- H. Doors shall be bonderized and coated with one prime coat of rust inhibitive paint.

2-02 METAL DOORS AND WINDOW FRAMES:

- A. Interior and Exterior Frames:
 - (1) Interior frames shall be custom fabricated units, full wrap around for 8" walls or less and butt frames for walls over 8" in thickness, as fabricated by Lockhart Manufacturing Company of Charlotte, North Carolina, or approved equal.
 - (2) Exterior frames shall be butt on exterior side and wrap on interior face.
- B. Frames for interior units including 3'0" wide and less shall be fabricated from 16 ga. material. Frames for units over 3'0" wide and all exterior frames shall be fabricated from 14 ga. material.
- C. Frames shall be constructed in accordance with the profile details as required. All corners shall be shop assembled, weld corners, molds, returns to insure a rigid joint.
- D. Double rabbit external side of exterior frames.
- E. Furnish not less than 3 adjustable anchors per jamb and a floor anchor at each jamb. Furnish a removable steel angle spreader with each frame to insure rigidity during transit and handling.
- F. Frames shall be mortised and reinforced with steel plate and tapped for hardware, templates will be furnished. Surface type hardware such as closures, holders, etc., will be reinforced for field drilling and tapping. Mortar boxes are to be installed over all hardware cut-outs.
- G. Provide labeled frames where scheduled. Protect labels from paint.
- H. Frames shall be bonderized and flow coated with one prime coat of rust inhibitive primer.
- I. Grout frames solid.
- J. NO HAMMER MARKS WILL BE ACCEPTED!

<u>SPECIAL NOTE</u>: Hollow metal frames for 16" thick masonry walls where they occur maybe 12" butt frames.

- K. Hardware: See Section 08 71 00 Door Hardware.
- 2-03 <u>SPECIAL NOTE FOR UNDERCUT DOORS AND LOUVERS</u>: It shall be the responsibility of this subcontractor to undercut all doors that are indicated on the mechanical plans to be undercut and also to cut all openings in all doors as indicated on the mechanical plans for louvers of the size and shape as shown on the mechanical plans. The mechanical subcontractor shall be responsible for furnishing and installing these louvers for the openings. <u>THE MILLWORK SUBCONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE ABOVE WITH THE MECHANICAL SUBCONTRACTOR</u>. NO LOUVERS SHALL BE INSTALLED IN RATED DOORS.

2-04 SPECIAL NOTE FOR MAGNETIC DOOR SWITCHES:

Manufacturer is to prepare hollow metal frame and door for magnetic switches where required. Coordinate with security.

End of Section

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SECTION 08 14 00 - WOOD DOORS

PART 1 GENERAL

- **1-01 <u>REQUIREMENTS</u>**: The requirements of all sections of Division One apply to work under this section. All plastic laminate doors shall have a lifetime warranty against swelling, delaminating and warping.
- **1-02 WORK INCLUDED:** Furnish plant labor and materials to complete wood doors indicated, specified or both.
- **1-03** <u>WORK NOT INCLUDED</u>: Labor for installing doors is included in Section 06 10 00 - ROUGH CARPENTRY.
- **1-04 PROTECTION**: Protect doors from moisture and damage before and during delivery. Do not install until after concrete and adjacent masonry work has been completed and made dry. Store wood doors flat on level surface in a dry, ventilated structure. Doors to be delivered to job site only after HVAC system is operational.
- **1-05 FABRICATION:** Confirm requirements for tolerances, undercuts, grilles, lights, hardware and similar items prior to fabrication.
- **1-06 PANELED, LOUVERED, ETC., DOORS**: In general conform to the requirements of the NWMA. Lumber for these doors shall be manufacturer's standard grade and species as approved by the Architect.
- **1-07** <u>SHOP DRAWINGS:</u> Submit shop drawings and qualification documents on all doors.
- **1-08 <u>RATED DOORS</u>**: Where rated doors are indicated, provide label on same. Match grade and face veneers of non-rated doors.

PART 2 PRODUCTS

2-01 FLUSH DOORS: Doors shall be 1-3/4" solid stave lumber core doors with plain sliced stain grade red oak faces as manufactured by Algoma, VT Industries, Mohawk, or approved equal. All doors shall have pre-finished stain on all sides. Color to be selected by owner.

2-02 SPECIAL NOTES:

(A) This subcontractor shall refer to the mechanical plans and is responsible for coordinating with the mechanical subcontractor regarding the above work, including louver location and installation of same in all wood doors.

(B) For undercut doors and louvers; it shall be the responsibility of this subcontractor to undercut all doors as indicated on the mechanical plans and also to cut all openings in all doors for louvers of the size and shape as indicated and shown on the mechanical plans. The mechanical subcontractor shall be responsible for furnishing and installing these louvers for the openings. NO louvers shall be installed in rated doors.

END OF SECTION

SECTION 08 70 00 - FINISH HARDWARE

PART ONE - GENERAL

1-01 QUALITY ASSURANCE

- (A) Acceptable Designs: Specified products and their manufacturers establish acceptable design, material, type, grade, size, function, and finish of hardware items required. Do not substitute other products, except with Architect's acceptance.
- (B) Manufacturer: Obtain each kind of hardware [latch and locksets, hinges, closers] from only one manufacturer, although several may be indicated as offering products complying with the manufacturer's requirements.
- (C) Supplier: The hardware supplier shall be a full member of the Society of Architectural Hardware Consultants and shall be available during normal working hours during the course of the project for hardware consultation to the Owner, Architect, and Contractor.

1-02 SUBMITTALS

- (A) Product Data: Submit in accordance with the requirements of Section 01 33 00. Include installation and maintenance instructions for operating parts and finish. Transmit copy of applicable data to Installer.
- (B) Certificates: Any hardware that is furnished other than that scheduled on the drawings shall have manufacturer's certificates certifying that the hardware meets this specification submitting the hardware shop drawings.
- (C) Hardware Schedule: Submit final hardware schedule in the manner and format indicated below. Hardware schedules are intended for coordination of work.
 - 1. Organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening, including:
 - a) Type, style, function, size and finish of each hardware item.
 - b) Name and manufacturer of each item.
 - c) Fastenings and other pertinent information.
 - d) Location of hard set cross-referenced to indications on Drawings both on floor plans and in door and frame schedule.
 - e) Explanation of all abbreviations, symbols, code, etc. contained in schedule.
 - f) Mounting locations for hardware.
 - g) Door and frame sizes and materials.
 - 2. Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work [e.g. hollow metal frames], which is critical in the project construction schedule.
 - 3. Include product data, samples, shop drawings of other work affected by builder's hardware, and other information essential to the coordinated review of hardware schedule.

- 4. Templates: Furnish for the installation of all hardware and to the manufacturer of related equipment for his preparation of that equipment for all hardware that must be attached thereto. Templates shall also be furnished to the manufacturer of wood doors for use on all wood doors that are factory fitting and factory machined for hardware.
- (D) Keying Schedule: Submit separate detail schedule indicating clearly how the Owner's final instruction on keying of locks has been fulfilled. Prior to submittal, blank key schedule to be completed by maintenance personnel.
- (E) Samples: Prior to submittal of the final hardware schedule and prior to final ordering of builders hardware, submit one sample of each type of exposed hardware unit, finished as required, and tagged with full description for coordination with schedule.

1-03 JOB CONDITIONS

- (A) Coordinate hardware with other work. Tag each item or package separately with identification related to the final hardware schedule. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security, and similar requirements indicated as necessary for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper location [shop or project site] for installation.
- (B) Packing and Marking: Package each item of hardware separately in individual containers, complete with necessary screws, keys, instructions and installation templates for spotting mortising tools. Mark each container with item's number corresponding to number shown on hardware supplier's schedule and properly tag each cylinder's key.
- (C) Provide secure lock-up for hardware delivered to the project but not the installed. Control the handling and installation of hardware items, which are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses, both before and after installation.
- (D) Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check the shop drawings of such other work to confirm that adequate provisions are made for the proper installation of hardware.
- (E) Inspection of Hardware and Installation: The hardware supplier shall visit the project when the hardware is delivered and check it before it is installed. He shall visit the project again after all the hardware has been installed and shall notify the Architect if there is any hardware that has not been installed correctly. Contractor and supplier shall furnish Architect with written certification to this effect. After the hardware is installed, the hardware supplier shall meet with the Owner or his representative and explain the functions, uses, and maintenance of all types of hardware installed. The Contractor shall turn over to the owner, after completion of the work, all tools, wrenches and templates that come packaged with the hardware for the Owner's use in servicing the hardware. The hardware supplier shall adjust the door closers for proper operation with particular attention being given to final operation of the air conditioning, heating and ventilating system.

PART TWO - PRODUCTS

2-01 PRODUCTS

- (A) Acceptable Manufacturers:
 - 1. Hinges: Bommer, McKinney, Stanley, Hager
 - 2. Continuous Gear Hinges: ABH, Select, Pemko
 - 3. Cylinders: Dorma
 - 4. Door Closers: Dorma, Stanley
 - 5. Locks, Latches: Best, Corbin Russwin, Schlage, Dorma
 - 6. Silencers, Stops & Flush Bolts: Baldwin, Ives, Rockwood, Hager
 - 7. Kick Plates, & Misc.: Baldwin, Ives, Rockwood, Hager
 - 8. Weatherstrip: National Guard, Pemko, Zero, Hager
 - 9. Push/Pulls: Baldwin, Ives, Rockwood, Hager
 - 10. Exit Devices: Dorma
 - 11. Thresholds: National Guard, Pemko, Zero, Hager
 - 12. Overhead Stops/Holders: ABH, Glynn-Johnson, Sargent, Dorma
 - 13. Electronics: RCI, Locknetics, Best, Doram
 - 14. Auto Operators: Hunter, Beasam, LCN, Dorma

2-02 MATERIALS, FABRICATION AND FINISHES

- (A) General
 - 1. Manufacturer's Name Plate: Do not use products which have manufacturer's name or trade name displayed in a visible location except in conjunction with required UL labels.
 - 2. Unless otherwise noted, exposed hardware items shall receive satin stainless steel finish.
 - 3. Furnish screws of type as required for substrates indicated with each hardware item. Finish exposed screws to match the hardware finish or, if exposed in surfaces of other work, to match the finish of such other work as closely as possible.
 - 4. Unless otherwise noted, provide concealed fasteners for hardware units that are exposed when door is closed. Where fasteners must remain exposed when door is closed. Where fasteners must remain exposed, provide vandal resistant fasteners.
 - Finish shall be as scheduled. Dull Chrome [US26D], Dull Stainless Steel [US32D] Aluminum Lacquer [AL], Extruded Aluminum [Alum] and Prime Coat [USP] as listed.
 - 6. Tools for maintenance: Furnish a complete set of specialized tools as needed for Owner's continued adjustment, maintenance and removal and replacement of builder's hardware.
 - 7. Hardware Operation: Force required to activate door hardware shall be not greater than 5 lbf.
 - 8. Door Opening Force: Maximum force for pushing or pulling open a door shall comply with this paragraph. For hinged doors the force shall be applied perpendicular to the door at the door opener or 30 inches from the hinged side whichever is farther from the hinge.

- a) Exterior hinged doors shall not exceed 8.5 lbf. Slight increases in opening force shall be allowed where 8.5 lbf. is insufficient to compensate for air pressure differentials.
- b) Interior hinged doors shall not exceed 5.0 lbf.
- c) Fire doors shall be adjusted to meet the minimum opening force permitted by governing fire safety standards.
- (B) Hinges:
 - 1. Provide template-produced hinges complying with ANSI A156.1.
 - 2. Provide stainless steel pins, non-removable type for exterior doors and non-rising types for interior doors. Pins shall have flat button ends finished to match hinge leaves.
 - 3. Hinges shall be full-mortised, 4½" x 4½" unless otherwise noted; five knuckle ball bearing type, heavy or standard duty rated, as specified.
- (C) Lock Cylinders and Keying:
 - 1. Metals: Construct lock cylinder parts from brass/bronze, stainless steel, or nickel silver.
 - 2. Equip locks with Construction Cores. Permanent interchangeable cores to be installed in all locks and exit devices at the completion of construction.
 - 3. Comply with the Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.
 - 4. Key Material: Provide keys of nickel silver only.
 - 5. Key Quantity: Furnish three keys for each lock and four keys for each master key, four Grand Master Keys, four Great Grand Master Keys.
 - 6. Permanently inscribe each key with number of Lock and notation "Do Not Duplicate"
 - 7. Keying: Key into Dorma serialized key control system (SKC), as directed by the Architect and/or Owner. Furnish four (4) Grand Masterkeys, four (4) Masterkeys, three (3) keys per lock.
 - 8. Locks to have ten (10) year warranty.
 - 9. Key Cabinet: Furnish a key cabinet of sufficient size to accommodate this work plus 50%. Lund, Key Control and Telkee are acceptable.
- (D) Locks and Latches:
 - 1. Strikes: Except as otherwise indicated or specified, provide manufacturer's standard wrought box strike for each latch or lock bolt with curved lip extended to protect frame, finished to match hardware set.
 - 2. Handles and knobs: Provide manufacturer's lever handle set complete with stem, roses and trim unless otherwise noted.
 - 3. Lock throw: Provide 1/2" minimum throw on doors.
- (E) Exit Devices: Exit devices shall be as scheduled with no substitutes accepted. Exit devices shall comply with ANSI Standard 156.3 Grade 1 modified as follows:
 - 1. The devices shall be "touchpad" type with touchpad, which shall extend a minimum of 1/2 of the door width.
 - 2. Devices should have a ¼" gap between the face of the door and the touchbar unit eliminating the need for shims or cutting away the glass moulding.

- 3. Lock stile chassis shall be cast bronze. Stamped steel units will not be accepted. All device latchbolts shall be stainless steel and where used in vertical rod devices shall be deadlocking type.
- 4. Device strikes shall be investment cast stainless steel.
- 5. Device end cap shall be all metal and secured with bracket that completely inserts into device housing.
- 6. All outside device trim shall be cast or forged brass full escutcheon. Lever trim shall be "vandal resistant" with substantial resistance to rotation when locked.
- 7. Devices must be convertible from one function to another simply by exchanging back plate assembly in lock stile case and selecting proper outside trim.
- 8. Device shall be secured to the door with sex bolts and through bolting at both ends.
- 9. All devices shall be UL approved for all types and functions indicated in the Hardware Schedule.
- 10. Devices shall have published ten-year warranty.
- 11. All exit devices shall be by the same manufacturer.
- 12. Mullions shall be "keyed removable" type with only a key required for take down. No key or tools shall be required to reinstall. Mullions shall be by the same manufacturer as the exit devices.
- (F) Closers: Shall be as scheduled.
 - 1. Closer shall be non-handed and adjustable.
 - 2. Closer shall have twenty-five year warranty.
 - 3. Closer shall have all season fluid to eliminate seasonal adjustment.
- G) Overhead Stops/Holders: Shall be as scheduled No Sub.
 - 1. Units shall have metal/plated end plugs.
 - 2. Units mounting screws shall be designed so that they go through housing and end plug.
 - 3. Units shall have metal slide.
 - 4. All stops shall be by same manufacturer.
- (H) Silencers, Stops & Flush Bolts: Shall be as scheduled.
 - 1. Silencers: Provide plug-type [not adhered type] silencers in all metal door frames unless continuous bumper-type weather-stripping is shown or specified. Provide 3 silencer units in door frames.
 - 2. All Stops [wall and floor] shall be by the same manufacturer.
 - 3. Flush bolts shall have 3/4" throw with 2" vertical adjustment. Shall have override feature and stainless steel cams and rubplates. All flush bolts shall be by the same manufacturer.
- (I) Door Stripping and Seals: Unless otherwise indicated, provide full-length weather-stripping at each edge of every exterior swing door leaf. All weatherstripping to be by same manufacturer.
- (J) Thresholds: Extruded aluminum, smooth commercial mill finish, grooved tread, 4" minimum tread by full door width. Thickness of threshold shall be 0.5" at primary tread surfaces, 0.1875" for secondary tread surfaces, and 0.125" for concealed flanges and legs.

(K) Kick Plates, Mop Plates and Armor Plates: .050 material sized as follows:

Kick Plates:	8 x 2 LDW
Mop Plates:	4 x 2 LDW
Armor Plates:	16 x 2 LDW

2-03 SCHEDULE OF HARDWARE

(A) To be provided by hardware supplier.

PART THREE - EXECUTION

3-01 INSTALLATION

- (A) General: Properly tag, index, and file all keys until turned over to the Owner. Apply hardware in accordance with templates and manufacturer's instructions; mortise and fit accurately; apply securely and adjust carefully.
 - 1. Mount hardware units at heights recommended in "Recommended Locations for Builders Hardware" by DHI, except where shown otherwise on drawings.
 - 2. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate.
 - 3. Set units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
 - 4. Exercise care not to injure work when applying hardware. Review shop drawings and Contract Drawings for proper location. Cover door hardware with a heavy cloth until painting is completed. At completion of the work, examine doors and hardware, adjust as required and leave hardware in proper working order, free from defects.
 - 5. At all times be responsible for the distribution of keys for hardware installed during construction, and cause all keys to be returned prior to final completion of the building
- (B) Preparation:
 - 1. Do not install finish hardware until the wet trades have been fully completed.
 - Supplier shall mark each item of hardware for location. Protect markings until each item is installed. If any item of hardware is delivered to the Project not properly marked, return it to the supplier for marking before attempting to install it.
 - 3. Install and make necessary adjustments for proper working order. Hardware damaged by improper adjustments or abuse will be rejected.
 - 4. Provide clean, properly sized, and accurately placed mortises and drilled holes for all mortise and surface mounted finish hardware. Use appropriate jigs, templates, and power mortising equipment for the installation of all mortised hardware items.
 - 5. Metal frames to receive hardware items shall be drilled and tapped accurately.

- 6. Removal for Painting:
 - a) Before painters' finish is applied, remove all finish hardware except prime-coated items.
 - b) After final paint and finish coats are dry, permanently replace and adjust finish hardware for proper operation.
- (C) Thresholds:
 - 1. Cut and fit threshold to profile door frames, with mitered corners and hairline joints. Screw thresholds to substrate with No. 10 or larger bronze or stainless steel screws.
 - 2. Set thresholds in a bed of either butyl/rubber sealant or polyisobutylene mastic sealant to completely fill concealed voids and exclude moisture from every source. Do not plug drainage holes or block weeps. Remove excess sealant.
- (D) Weatherstrip: Accurately install weatherstrip to the door or frames where scheduled using proper type flush fasteners spaced not over 18" o.c. Installed work shall make continuous contact with the abutting surfaces and shall function for use intended. Adjust seals as required.
- (E) Mounting Heights: Shall be as follows, measured from finished floor except for top hinge which is measured from door top:
 - 1. Bottom hinge: 10-3/8" [hinge center].
 - 2. Top hinge: 9-3/4" [hinge center].
 - 3. Intermediate hinges: Equally spaced between top and bottom hinges.
 - 4. Locks and latches: 38" [operating spindle].
 - 5. Pulls, pull and push plates: 42" [center].

3-02 ADJUST AND CLEAN

- (A) Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Lubricate moving parts with type lubricant recommended by manufacturer [graphite-type if no other recommended]. Replace units that cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.
- (B) Upon completion of the work and before final acceptance demonstrate that all hardware is in satisfactory working order, that all keys fit in their respective locks, and upon acceptance of the work, tag and deliver all keys to the Owner.
- (C) Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy and make a final check and adjustment of all hardware items in such space or area. Clean and re-lubricate operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- (D) Instruct Owner's personnel in proper adjustment and maintenance of hardware and hardware finish during the final adjustment of hardware.

END OF SECTION

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DIVISION NO. 09 – FINISHES

SECTION 09 65 13 - RESILIENT BASE AND ACCESSORIES

PART ONE – GENERAL

1.1 <u>RELATED DOCUMENTS</u>

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

1.2 <u>SUMMARY</u>

- A. Section Includes:
 - 1. Resilient base.
 - 2. Resilient molding accessories.
- B. Related Sections:
 - 1. Section 096519 "Resilient Tile Flooring" for resilient floor tile.

1.3 <u>ACTION SUBMITTALS</u>

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

B. Mockups: Provide resilient products with mockups specified in other Sections.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.7 **PROJECT CONDITIONS**

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART TWO - PRODUCTS

- 2.1 **<u>RESILIENT BASE</u>** < Insert drawing designation>
 - A. Resilient Base:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Armstrong World Industries, Inc.
 - b. Johnsonite.
 - c. Roppe Corporation, USA.
 - B. Resilient Base Standard: ASTM F 1861.
 - 1. Material Requirement: Type TS (rubber, vulcanized thermoset) Type TP&TV not acceptable.
 - 2. Manufacturing Method: Group I (solid, homogeneous.
 - 3. Style: Cove (base with toe).

- C. Minimum Thickness: 0.125 inch.
- D. Height: 4 inches.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed or preformed.
- G. Inside Corners: Job formed or preformed.
- H. Finish: As selected by Architect from manufacturer's full range.
- I. Colors: As selected by Architect from full range of industry colors.

2.2 RESILIENT MOLDING ACCESSORY

- A. Resilient Molding Accessory:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by same manufacturer as resilient base.
- B. Description: Transition strips.
- C. Material: Rubber.
- D. Profile and Dimensions: As indicated.
- E. Colors: [As selected by Architect from full range of industry colors.
- F. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24)[, except that adhesive for rubber stair treads shall have a VOC content of 60 g/L or less].

PART THREE - 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.
- B. 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.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

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 and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

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 practicable 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. Preformed Corners: Install preformed corners before installing straight pieces.
- G. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.

- 2. Inside Corners: Use straight pieces of maximum lengths possible.
- H. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpetand resilient floor tiles that would otherwise be exposed.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products. General Contractor to protect installed product.
- B. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Damp-mop 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 until Substantial Completion.

END OF SECTION 09 65 13

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SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.1 <u>RELATED DOCUMENTS</u>

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

1.2 <u>SUMMARY</u>

- A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.
- B. Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
 - 1. Painting includes field-painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
 - 1. Prefinished items not to be painted include the following factory-finished components:
 - a. Metal toilet enclosures.
 - b. Acoustic materials.
 - c. Architectural woodwork and casework.
 - d. Elevator entrance doors and frames.
 - e. Elevator equipment.
 - f. Finished mechanical and electrical equipment.
 - g. Light fixtures.
 - h. Switchgear.
 - i. Distribution cabinets.
 - 2. Concealed surfaces not to be painted include wall or ceiling surfaces in the following generally inaccessible areas:
 - a. Foundation spaces.
 - b. Furred areas.
 - c. Utility tunnels.

- d. Pipe spaces.
- e. Duct shafts.
- f. Elevator shafts.
- 3. Finished metal surfaces not to be painted include:
 - a. Anodized aluminum.
 - b. Stainless steel.
 - c. Chromium plate.
 - d. Copper.
 - e. Bronze.
 - f. Brass.
- 4. Operating parts not to be painted include moving parts of operating equipment, such as the following:
 - a. Valve and damper operators.
 - b. Linkages.
 - c. Sensing devices.
 - d. Motor and fan shafts.
- 5. Labels: Do not paint over Underwriters Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
- D. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 5 Section "Structural Steel" for shop-priming structural steel.
 - 2. Division 5 Section "Metal Fabrications" for shop-priming ferrous metal.
 - 3. Division 6 Section "Interior Architectural Woodwork" for shop-priming interior architectural woodwork.
 - 4. Division 6 Section "Exterior Architectural Woodwork" for shop-priming exterior architectural woodwork.
 - 5. Division 6 Section "Custom Casework" for shop-priming custom wood casework.
 - 6. Division 8 Section "Standard Steel Doors and Frames" for shop-priming steel doors and frames.
 - 7. Division 9 Section "Special Coatings" for special coatings.
 - 8. Division 9 Section "Exterior Wood Stains" for exterior wood stains.
 - 9. Division 9 Section "Wall Coverings" for substrate sealer under wall coverings.
 - 10. Divisions 15 and 16: Painting mechanical and electrical work is specified in Divisions 15 and 16, respectively.

1.3 <u>SUBMITTALS</u>

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each paint system specified, including block fillers and primers.
 - 1. Provide the manufacturer's technical information including label analysis and instructions for handling, storage, and application of each material proposed for use.

- 2. List each material and cross-reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.
- 3. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- C. Samples for initial color selection in the form of manufacturer's color charts.
 - 1. After color selection, the Architect will furnish color chips for surfaces to be coated.
- D. Samples for Verification Purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.
 - 1. Provide stepped samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
 - 2. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
 - 3. Submit samples on the following substrates for the Architect's review of color and texture only:
 - a. Concrete: Provide two 4-inch-square samples for each color and finish.
 - b. Concrete Masonry: Provide two 4-by-8-inch samples of masonry, with mortar joint in the center, for each finish and color.
 - c. Painted Wood: Provide two 12-inch-square samples of each color and material on hardboard.
 - d. Stained or Natural Wood: Provide two 4-by-8-inch samples of natural and stained wood finish on actual wood surfaces.
 - e. Ferrous Metal: Provide two 4-inch-square samples of flat metal and two 8-inch-long samples of solid metal for each color and finish.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.
- B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- C. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.
 - 1. Final acceptance of colors will be from job-applied samples.
 - 2. The Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted. Apply

coatings in this room or surface according to the schedule or as specified.

a. After finishes are accepted, this room or surface will be used to evaluate coating systems of a similar nature.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements,

manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

- B. Manufacturer: Subject to compliance with requirements, provide products of one of the following:
 - 1. Devoe and Raynolds Co. (Devoe).
 - 2. Fuller O'Brien (Fuller).
 - 3. The Glidden Company (Glidden).
 - 4. Benjamin Moore and Co. (Moore).
 - 5. PPG Industries, Pittsburgh Paints (PPG).
 - 6. Pratt and Lambert (P & L).
 - 7. The Sherwin-Williams Company (S-W).

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.
- B. Material Quality: Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
 - 1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.
- C. Colors: Provide custom colors of the finished paint systems to match the Architect's samples.
- D. Colors: Match colors indicated by reference to the manufacturer's standard color designations.
- E. Colors: Provide color selections made by the Architect from the manufacturer's full range of standard colors.

2.3 MASONRY BLOCK FILLER

- A. Filler Coat Materials: Provide the manufacturer's recommended factory-formulated, latex-type concrete masonry block fillers that are compatible with the finish materials indicated.
- B. Available Products: Subject to compliance with requirements, block fillers that may be incorporated in the Work include, but are not limited to, the following:
- C. Products: Subject to compliance with requirements, provide one of the following:

- 1. High-Performance Latex Block Filler:
 - a. Devoe:52901 Bloxfil Interior/Exterior Acrylic Latex Block Filler.
 - b. Fuller:280-00 Interior/Exterior Latex Block Filler.
 - c. Glidden:5317 Ultra-Hide Acrylic Latex Block Filler.
 - d. Moore: Moorcraft Interior & Exterior Block Filler #173.
 - e. PPG:6-7 Latex Masonry Block Filler.
 - f. P & L:Pro-Hide Plus Block Filler.
 - g. S-W:Heavy-Duty Block Filler B42W46.

2.4 PRIMERS

- A. Primers: Provide the manufacturer's recommended factory-formulated primers that are compatible with the substrate and finish coats indicated.
- B. Available Products: Subject to compliance with requirements, prime coat materials that may be incorporated in the Work include, but are not limited to, the following:
- C. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Exterior Primer Coating: Exterior, alkyd wood primer.
 - a. Devoe:1102 All-Weather Alkyd House Paint Primer.
 - b. Fuller:220-23 Exterior Wood and Masonry Primer.
 - c. Glidden:1951 Spred Gel-Flo Base Coat.
 - d. Moore:Moorwhite Primer #100.
 - e. PPG:Not Required.
 - f. P & L:Permalize Exterior Primer.
 - g. S-W:Not required.
 - 2. Concrete and Masonry Primers: Interior, flat, latex-based paint.
 - a. Devoe:51701 Wonder-Prime Interior All Purpose Latex Primer Sealer & Vapor Barrier.
 - b. Fuller:202-XX Interior Exterior Acrylic Latex Wall Paint.
 - c. Glidden:5300 Ultra-Hide Flat Wall Paint.
 - d. Moore:Moore's Latex Quick-Dry Prime Seal #201.
 - e. PPG:80 Line Wallhide Flat Latex Paint.
 - f. P & L:Vapex Latex Flat Wall Finish.
 - g. S-W:ProMar 200 Latex Flat B30W200.
 - 3. New Plaster Primers: Interior, flat, latex-based paint.
 - a. Devoe:51701 Wonder-Prime Interior All Purpose Latex Primer Sealer & Vapor Barrier.
 - b. Fuller:Interior Latex Enamel Undercoater.
 - c. Glidden:5019 PVA Primer Sealer.
 - d. Moore:Moore's Latex Quick-Dry Prime Seal #201.
 - e. PPG:80 Line Wallhide Flat Latex Paint.
 - f. P & L:Vapex Latex Flat Wall Finish.
 - g. S-W:Wall and Wood Primer B49W2.
 - 4. Gypsum Drywall Primer: White, interior, latex-based primer.
 - a. Devoe:50801 Wonder-Tones Latex Primer and Sealer.
 - b. Fuller: Pro-Tech Interior Latex Wall Primer and Sealer.

- c. Glidden:5019 PVA Primer.
- d. Moore:Moore's Latex Quick-Dry Prime Seal #201.
- e. PPG:6-2 Quick-Dry Latex Primer Sealer.
- f. P & L:Latex Wall Primer Z30001.
- g. S-W:ProMar 200 Latex Wall Primer B28W200.
- 5. Exterior Primer Coating: Exterior, alkyd wood primer.
 - a. Devoe:1102 All-Weather Alkyd House Paint Primer.
 - b. Fuller:220-23 Exterior Wood and Masonry Primer.
 - c. Glidden:1951 Spred Gel-Flo Base Coat.
 - d. Moore:Moorwhite Primer #100.
 - e. PPG:1-70 or 1-870 Sun-Proof Exterior Wood Primer.
 - f. P & L:Permalize Exterior Primer.
 - g. S-W:A-100 Exterior Alkyd Wood Primer Y24W20.
- 6. Exterior Primer Coating: Exterior, alkyd wood primer.
 - a. Devoe:1102 All-Weather Alkyd House Paint Primer.
 - b. Fuller:220-08 Exterior Latex Wood Primer.
 - c. Glidden:3651 Spred House Paint Prime Coat.
 - d. Moore:Moorwhite Primer #100.
 - e. PPG:1-70 or 1-870 Sun-Proof Exterior Wood Primer.
 - f. P & L:Permalize Exterior Primer.
 - g. S-W:A-100 Exterior Alkyd Wood Primer Y24W20.
- 7. Ferrous Metal Primers: Synthetic, quick-drying, rust-inhibiting primers.
 - a. Devoe:13101 Mirrolac Cover Up Rust Penetrating Primer.
 - b. Fuller:621-04 Blox-Rust Alkyd Metal Primer.
 - c. Glidden:5210 Glid-Guard Universal Fast-Dry Metal Primer.
 - d. Moore:IronClad Retardo Rust-Inhibitive Paint #163.
 - e. PPG:6-208 Red Inhibitive Metal Primer.
 - f. P & L:Effecto Rust-Inhibiting Primer.
 - g. S-W:Kem Kromik Metal Primer B50N2/B50W1.
- 8. Ferrous Metal Primers: Alkyd-type primers.
 - a. Devoe:41820 Bar-Ox Alkyd Shop/Field Primer Grey.
 - b. Fuller:621-05 Blox-Rust Latex Metal Primer.
 - c. Glidden:5205 Glid-Guard Tank and Structural Primer.
 - d. Moore:IronClad Retardo Rust-Inhibitive Paint #163.
 - e. PPG:6-612 Speedhide Inhibitive White Primer.
 - f. P & L:Effecto Primer Red or White.
 - g. S-W:Kem Kromik Metal Primer B50N2/B50W1.
- 9. Galvanized Metal Primers:
 - a. Devoe:13201 Mirrolac Galvanized Metal Primer.
 - b. Fuller:621-05 Blox-Rust Latex Metal Primer.
 - c. Glidden:5229 Glid-Guard All-Purpose Metal Primer.
 - d. Moore:IronClad Galvanized Metal Latex Primer #155.
 - e. PPG:6-215/216 Speedhide Galvanized Steel Primer.
 - f. P & L:P & L Interior Trim Primer.
 - g. S-W:Galvite B50W3.
- 10. Aluminum Primers:
 - a. Devoe:41820 Bar-Ox Alkyd Shop/Field Primer Grey.
 - b. Fuller:621-05 Blox-Rust Latex Metal Primer.

- c. Glidden:5229 Glid-Guard All-Purpose Metal Primer.
- d. Moore:No Primer Required.
- e. PPG:6-712 Speedhide Inhibitive Metal Primer, White.
- f. P & L:Effecto Primer Red or White.
- g. S-W:No Primer Necessary.

2.5 UNDERCOAT MATERIALS

- A. Undercoat Materials: Provide the manufacturer's recommended factory-formulated undercoat materials that are compatible with the substrate and finish coats indicated.
- B. Available Products: Subject to compliance with requirements, undercoat materials that may be incorporated in the Work include, but are not limited to, the following:
- C. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Interior Enamel Undercoat: Ready-mixed enamel.
 - a. Devoe:51701 Wonder-Prime Interior All Purpose Latex Primer Sealer & Vapor Barrier.
 - b. Fuller:220-06 Interior Alkyd Wall Primer Sealer.
 - c. Glidden:4200 Spred Ultra Semi-Gloss Enamel.
 - d. Moore:Moore's Alkyd Enamel Underbody #217.
 - e. PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - f. P & L:E6 Enamel Undercoater.
 - g. S-W:ProMar 200 Latex Wall Primer B28W200.
 - 2. Interior Enamel Undercoat: Ready-mixed enamel.
 - a. Devoe:8801 Velour Alkyd Enamel Undercoat.
 - b. Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - c. Glidden:4200 Spred Ultra Semi-Gloss Enamel.
 - d. Moore:Moore's Alkyd Enamel Underbody #217.
 - e. PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - f. P & L:Interior Trim Primer.
 - g. S-W:ProMar 200 Alkyd Semi-Gloss Enamel B34W200.
 - 3. Interior Enamel Undercoat: Ready-mixed enamel.
 - a. Devoe:8801 Velour Alkyd Enamel Undercoat.
 - b. Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - c. Glidden:4200 Spred Ultra Semi-Gloss Enamel.
 - d. Moore:Moore's Alkyd Enamel Underbody #217.
 - e. PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - f. P & L:Interior Trim Primer.
 - g. S-W:Wall and Wood Primer B49W2.
 - 4. Interior Enamel Undercoat: Ready-mixed enamel.
 - a. Devoe:8801 Velour Alkyd Enamel Undercoat.
 - b. Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - c. Glidden:4500 Glid-Guard Enamel.
 - d. Moore:Moore's Alkyd Enamel Underbody #217.
 - e. PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.

- f. P & L:Interior Trim Primer.
- g. S-W:Wall and Wood Primer B49W2.
- 5. Interior Enamel Undercoat: Ready-mixed enamel.
 - a. Devoe:8801 Velour Alkyd Enamel Undercoat.
 - b. Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - c. Glidden:310 Glidden Wood Undercoater.
 - d. Moore:Moore's Alkyd Enamel Underbody #217.
 - e. PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - f. P & L:Interior Trim Primer.
 - g. S-W:ProMar 200 Alkyd Enamel Undercoater B49W200.
- 6. Interior Enamel Undercoat: Ready-mixed enamel.
 - a. Devoe:8801 Velour Alkyd Enamel Undercoat.
 - b. Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - c. Glidden:4200 Spred Ultra Semi-Gloss Enamel.
 - d. Moore:Moore's Alkyd Enamel Underbody #217.
 - e. PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - f. P & L:Interior Trim Primer.
 - g. S-W:ProMar 200 Alkyd Enamel Undercoater B49W200.
- 7. Interior Enamel Undercoat: Ready-mixed enamel.
 - a. Devoe:8801 Velour Alkyd Enamel Undercoat.
 - b. Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - c. Glidden:4500 Glid-Guard Alkyd Enamel.
 - d. Moore:Moore's Alkyd Enamel Underbody #217.
 - e. PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - f. P & L:Interior Trim Primer.
 - g. S-W:ProMar 200 Alkyd Enamel Undercoater B49W200.

2.6 EXTERIOR FINISH PAINT MATERIAL

- A. Finish Paint: Provide the manufacturer's recommended factory-formulated finish-coat materials that are compatible with the substrate and undercoats indicated.
- B. Available Products: Subject to compliance with requirements, finish coat materials that may be incorporated in the Work include, but are not limited to, the following:
- C. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Exterior Acrylic Emulsion: Quick-drying, flat, acrylic paint.
 - a. Devoe:15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - b. Fuller:262-XX 100% Acrylic Exterior Flat Finish.
 - c. Glidden:3525 Spred Glide-On.
 - d. Moore: Moore's Flat Exterior Latex Masonry & House Paint #105.
 - e. PPG:72 Line Sun-Proof Acrylic Latex House Paint.
 - f. P & L:Vapex Latex Flat House Paint.
 - g. S-W:A-100 Acrylic Latex Flat Exterior Finish A-6 Series.
 - 2. Exterior, Polyvinyl Acetate Emulsion: Quick-drying, flat, polyvinyl acetate (PVA) paint.

- a. Devoe:20XX Wonder Guard Exterior Acrylic Latex Flat MasonryPaint.
- b. Fuller:263-XX Flat Latex House Paint.
- c. Glidden:3525 Spred Glide-On.
- d. Moore: Moore's Flat Exterior Latex Masonry & House Paint #105.
- e. PPG:37 Line Cementhide Latex Masonry Paint.
- f. P & L:Pro-Hide Plus Interior/Exterior Vinyl-Acrylic Flat Paint Z3400 Series.
- g. S-W:Weather Perfect Acrylic Latex Flat Exterior Finish B-36 Series.
- 3. Exterior Acrylic Emulsion: Quick-drying, flat, acrylic paint.
 - a. Devoe:15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - b. Fuller:667-XX Ful-Stain Flat Latex House Paint.
 - c. Glidden:3600 Spred House Paint.
 - d. Moore: Moorgard Latex House Paint #103.
 - e. PPG:72 Line Sun-Proof Acrylic Latex House Paint.
 - f. P & L:Vapex Latex Flat House Paint.
 - g. S-W:A100 Acrylic Latex Flat Exterior Finish A-6 Series.
- 4. Alkyd Gloss Enamel: Weather-resistant, air-drying, high-gloss enamel.
 - a. Devoe:70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - b. Fuller:312-XX EPA Compliant Heavy Duty Enamel.
 - c. Glidden:4500 Glid-Guard Industrial Enamel.
 - d. Moore:Impervo High-Gloss Enamel #133.
 - e. PPG:54 Line Quick-Dry Enamel.
 - f. P & L:Effecto Enamel.
 - g. S-W:Industrial Enamel B-54 Series.
- 5. Deep-Color, Exterior Alkyd Resin Trim Paint: Deep-color, ready-mixed alkyd paint.
 - a. Devoe:155 All-Weather Exterior Alkyd Gloss House and Trim Paint Ultra Deep Base.
 - b. Fuller:660-XX Weather King Alkyd House & Trim Paint.
 - c. Glidden:1901 Spred Dura Gloss Oil House Paint.
 - d. Moore: Moore's House Paint #110.
 - e. PPG:1 Line Sun-Proof Deeptone or Rustic Base Wood Finish.
 - f. P & L:Effecto Enamel.
 - g. S-W:SWP Exterior Gloss Finish A-2 Series.
- 6. Medium-Shade, Exterior, Ready-Mixed Oil Paint: Medium-shade, ready-mixed oil or alkyd-oil paint.
 - a. Devoe:1XX All-Weather Alkyd Gloss House and Trim Paint.
 - b. Fuller:660-XX Weather King Alkyd House & Trim Paint.
 - c. Glidden:1901 Spred Dura Gloss Oil House Paint.
 - d. Moore:Moore's House Paint #110.
 - e. PPG:1 Line Sun-Proof Midtone Base Wood Finish.
 - f. P & L:Effecto Enamel.
 - g. S-W:SWP Exterior Gloss Paint A-2 Series.
- 7. Alkyd-Oil Paint, Wood Shakes, and Rough Siding: Thin-bodied, alkyd-oil paint.
 - a. Devoe:94XX All-Weather Alkyd Solid Color Stain.
 - b. Fuller:Ful-Stain Solid Cote Oil Stain.
 - c. Glidden:9700 Endurance Oil Stain.

- d. Moore: Moorwood Solid Color Stain.
- e. PPG:77-600 Series Rez Solid Color Alkyd-Oil Stain.
- f. P & L:Solid-Hide Rustic Stain Finish.
- g. S-W:Exterior Solid Stain A-14 Series.
- 8. Exterior, Semitransparent, Oil-Based Stain: Exterior, semitransparent, oil-based wood stains:
 - a. Devoe:9000 All Weather Semi-Transparent Alkyd Stain and Wood Preservative.
 - b. Fuller:645-XX Ful-Stain Semi-Transparent Stain.
 - c. Glidden:9721 Line Endurance Oil Semi-Transparent Stain.
 - d. Moore:Moorwood Semi-Transparent Stain and Wood Preservative 081.
 - e. PPG:77-860, 900 Series Rez Semi-Transparent Wood Preservative and Water-Repellent Stain, Alkyd Oil Type.
 - f. P & L:Penetrating Rustic Stain.
 - g. S-W:Exterior Semi-Transparent Stain A-14 Series.
- 9. Gloss Alkyd Enamel: Weather-resistant, high-gloss enamel.
 - a. Devoe:70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - b. Fuller:312-XX epa Compliant Heavy Duty Enamel.
 - c. Glidden:4500 Glid-Guard Industrial Enamel.
 - d. Moore:Impervo High-Gloss Enamel #133.
 - e. PPG:54 Line Quick-Dry Enamel.
 - f. P & L:Effecto Enamel.
 - g. S-W:Industrial Enamel B-54 Series.
- 10. Deep-Color, Exterior, Alkyd Resin Trim Paint: Deep-color, ready-mixed alkyd paint.
 - a. Devoe:155 All-Weather Exterior Alkyd Gloss House and Trim Paint Ultra Deep Base.
 - b. Fuller:660-XX Weather King Alkyd House & Trim Paint.
 - c. Glidden:1901 Spred Dura Gloss Oil House Paint.
 - d. Moore:Moore's House Paint #110.
 - e. PPG:1 Line Sun-Proof Deeptone or Rustic Base Wood Finish.
 - f. P & L:Effecto Enamel.
 - g. S-W:SWP Exterior Gloss Finish A-2 Series.
- 11. Lusterless Alkyd Enamel: Flat, alkyd-based enamel.
 - a. Devoe:564XX De-Vo-Ko Lo-Lustre Alkyd H.P.
 - b. Moore: Moore's PentaFlex Flat House Paint #114.
 - c. PPG:50-52 Exterior Alkyd Flat Paint.
 - d. S-W:ProMar Alkyd Flat Exterior Finish B38 Series.
- 12. Gloss Alkyd Enamel: Weather-resistant, high-gloss enamel.
 - a. Devoe:70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - b. Fuller:312-XX EPA Compliant Heavy Duty Enamel.
 - c. Glidden:4500-Line Glid-Guard Industrial Enamel.
 - d. Moore:Impervo High-Gloss Enamel #133.
 - e. PPG:54 Line Quick-Dry Enamel.
 - f. P & L:Effecto Enamel.
 - g. S-W:Industrial Enamel B-54 Series.

2.7 INTERIOR FINISH PAINT MATERIAL

- A. Finish Paint: Provide the manufacturer's recommended factory-formulated finish-coat materials that are compatible with the substrate and undercoats indicated.
- B. Available Products: Subject to compliance with requirements, finish coat materials that may be incorporated in the Work include, but are not limited to, the following:
- C. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Interior, Flat, Latex-Based Paint: Ready-mixed, latex-based paint for a flat finish.
 - a. Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - b. Fuller:602XX Liquid Velvet Latex Wall Paint.
 - c. Glidden:3400 Spred Satin Latex Wall Paint.
 - d. Moore:Regal Wall Satin #215.
 - e. PPG:80 Line Wallhide Flat Latex Paint.
 - f. P & L:Vapex Latex Flat Wall Finish.
 - g. S-W:Classic 99 Wall and Trim Paint A27W10.
 - 2. Interior, Flat, Odorless, Alkyd Paint: Ready-mixed, interior, flat, low-odor, alkyd enamel.
 - a. Devoe:21XX Velour Alkyd Flat Wall Paint.
 - b. Fuller:101XX Liquid Velvet Alkyd Flat Wall Paint.
 - c. Glidden:5700 Ultra-Hide Alkyd Flat Wall Enamel.
 - d. Moore:Moore's Alkyd Sani-Flat #204.
 - e. PPG:6-50 Series Speedhide Alkyd Flat Wall Paint.
 - f. P & L:Lyt-All Flowing Flat.
 - g. S-W:ProMar 200 Alkyd Flat Wall Paint B32W101.
 - 3. Interior, Semigloss, Odorless Alkyd Enamel: Semigloss, low-odor, alkyd enamel.
 - a. Devoe:26XX Velour Alkyd Semigloss Enamel.
 - b. Fuller:110XX Fullerglo Alkyd Semigloss Enamel.
 - c. Glidden:4200 Spred Ultra Semigloss Enamel.
 - d. Moore: Moore's Satin Impervo Enamel #235.
 - e. PPG:27 Line Wallhide Semigloss Enamel.
 - f. P & L:Cellu-Tone Alkyd Satin Enamel.
 - g. S-W:Classic 99 Semigloss Enamel A40 Series.
 - 4. Interior, Flat, Latex-Based Paint: Ready-mixed, latex-based paint.
 - a. Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - b. Fuller:602XX Liquid Velvet Latex Wall Paint.
 - c. Glidden:3400 Spred Satin Latex Wall Paint.
 - d. Moore:Regal Wall Satin #215.
 - e. PPG:50-35 Latex Ceiling Paint.
 - f. P & L:Vapex Latex Flat Wall Finish.
 - g. S-W:Classic 99 Wall and Trim Paint A27W10.

- 5. Exterior, Gloss, Alkyd Enamel:
 - a. Devoe:70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - b. Fuller:312XX EPA Compliant Heavy Duty Enamel.
 - c. Glidden:4500 Glid-Guard Industrial Enamel.
 - d. Moore:Impervo High-Gloss Enamel #133.
 - e. PPG:54 Line Quick-Dry Enamel.
 - f. P & L:Effecto Enamel.
 - g. S-W:Industrial Enamel B-54 Series.

2.8 MISCELLANEOUS WOOD-FINISHING MATERIALS

- A. Wood-Finishing Materials: Provide the manufacturer's recommended factory-formulated, wood-finishing materials that are compatible with the substrate and undercoats indicated.
- B. Available Products: Subject to compliance with requirements, wood-finishing materials that may be incorporated in the Work include, but are not limited to, the following:
- C. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Varnish-Type Surface Sealer:
 - a. Devoe:1502 Wonder Shield Exterior Acrylic Latex House Paint Primer.
 - b. Glidden:3651 Spred House Paint Prime Coat.
 - c. PPG:77-1 Rez Sealer-Primer.
 - d. P & L:Varmor Penetrating Sealer.
 - e. S-W:Chek Gard Primer B42W10.
 - 2. Oil-Type Interior Wood Stain: Slow-penetrating, oil-type wood stain.
 - a. Devoe:96XX Wonder Woodstain Alkyd Stain.
 - b. Fuller:640-XX Pen-Chrome Interior Oil Base Wood Stain.
 - c. Glidden:1600 Woodmaster Oil Stain.
 - d. Moore:241 Moore's Interior Wood Finishes Penetrating Stain.
 - e. PPG:77-302 Rez Medium Tint Base.
 - f. P & L:S-Series Tonetic Wood Stain.
 - g. S-W:Oil Stain A-48 Series.
 - 3. Cut Shellac: Quick-drying, rosin-free, clear, general-purpose shellac varnish.
 - a. Devoe:4900 Wonder Woodsealer Quick-Dry Sealer.
 - b. Fuller:No recommendation.
 - c. Glidden:5035 Ultra-Hide Sanding Sealer.
 - d. Moore:413 Moore's Interior Wood Finishes Quick-Dry Sanding Sealer.
 - e. PPG:77-30 Quick Drying Sanding Sealer.
 - f. P & L:No recommendation.
 - g. S-W:ProMar Varnish Sanding Sealer B26V3.
 - 4. Paste Wood Filler: Solvent-based, air-drying, paste-type wood filler.
 - a. Devoe:4800 Wonder Woodstain Interior Paste Wood Filler.
 - b. Fuller:680-00 Pen Chrome Paste Wood Filler.

- c. Glidden:Glidden Paste Wood Filler.
- d. Moore:Benwood Paste Wood Filler #238.
- e. PPG:(none required)
- f. P & L:No recommendation.
- g. S-W:Sher-Wood Fast-Dry Filler.
- 5. Oil Rubbing Varnish: Clear, oil-type, rubbing varnish for use on interior stained or natural-finished woodwork:
 - a. Devoe:4600 Wonder Wood Satin Alkyd Satin Varnish.
 - b. Fuller:653-01 EPA Compliant Clear Polyurethane Satin Finish.
 - c. Glidden:82 Woodmaster Satin Sheen Urethane Varnish.
 - d. Moore:Benwood Satin Finish Varnish #404.
 - e. PPG:77-7 Rez Satin Varnish.
 - f. P & L:Clear Finish Gloss.
 - g. S-W:Oil Base Varnish, Gloss A66V91.
- D. Paste Wax: Provide paste wax as recommended by the coating manufacturer for use on interior stained and natural-finished woodwork.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.
 - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
 - 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean the

substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

- C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
 - 2. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen, as required, to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
 - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
 - c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
 - 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - b. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
 - c. When transparent finish is required, backprime with spar varnish.
 - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.
 - 4. Ferrous Metals: Clean ungalvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).
- a. Blast steel surfaces clean as recommended by the paint system manufacturer and according to requirements of SSPC specification SSPC-SP 10.
- b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
- c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.
- 5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.
 - 1. Maintain containers used in mixing and applying paint in a clean condition free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
 - 3. Use only thinners approved by the paint manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 <u>APPLICATION</u>

- A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - 1. Paint colors, surface treatments, and finishes are indicated in the schedules.
 - 2. Provide finish coats that are compatible with primers used.
 - 3. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
 - 4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film

thickness equivalent to that of flat surfaces.

- 5. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
- 6. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
- 7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
- 8. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
- 9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
- 10. Finish exterior doors on tops, bottoms, and side edges same as exterior faces.
- 11. Sand lightly between each succeeding enamel or varnish coat.
- 12. Omit primer on metal surfaces that have been shop-primed and touch-up painted.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 - 1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or eel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
- D. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.
 - 1. Brushes: Use brushes best suited for the material applied.
 - 2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
 - 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- E. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- F. Mechanical and Electrical Work: Painting mechanical and electrical work is limited to items exposed in mechanical equipment rooms and in occupied spaces.
- G. Mechanical items to be painted include, but are not limited to, the following:
 - 1. Piping, pipe hangers, and supports.

- 2. Heat exchangers.
- 3. Tanks.
- 4. Ductwork.
- 5. Insulation.
- 6. Supports.
- 7. Motors and mechanical equipment.
- 8. Accessory items.
- H. Electrical items to be painted include, but are not limited to, the following:
 - 1. Conduit and fittings.
 - 2. Switchgear.
- I. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- J. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- K. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.
- L. Pigmented (Opaque) Finishes: Completely cover to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- M. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections.
 - 1. Provide satin finish for final coats.
- N. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.

3.4 FIELD QUALITY CONTROL

- A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:
 - 1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the

Contractor.

- 2. The testing agency will perform appropriate tests for the following characteristics as required by the Owner:
 - a. Quantitative materials analysis.
 - b. Abrasion resistance.
 - c. Apparent reflectivity.
 - d. Flexibility.
 - e. Washability.
 - f. Absorption.
 - g. Accelerated weathering.
 - h. Dry opacity.
 - i. Accelerated yellowness.
 - j. Recoating.
 - k. Skinning.
 - I. Color retention.
 - m. Alkali and mildew resistance.
- 3. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are incompatible.

3.5 <u>CLEANING</u>

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 **PROTECTION**

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
 - 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 EXTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated.
- B. Concrete, Stucco, and Masonry (other than concrete masonry units):

- 1. Lusterless (Flat) Acrylic Finish: Two coats with total dry film thickness not less than 2.5 mils.
 - a. First and Second Coats: Exterior acrylic emulsion.
 - 1) Devoe:15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - 2) Fuller:262-XX 100% Acrylic Exterior Flat Finish.
 - 3) Glidden:3525 Spred Glide-On.
 - 4) Moore:Moore's Flat Exterior Latex Masonry & House Paint #105.
 - 5) PPG:72 Line Sun-Proof Acrylic Latex House Paint.
 - 6) P & L:Vapex Latex Flat House Paint.
 - 7) S-W:A-100 Acrylic Latex Flat Exterior Finish A-6 Series.
- 2. Lusterless (Flat) Acrylic Latex Finish: Two coats with total dry film thickness not less than 2.5 mils.
 - a. First and Second Coats: Exterior, polyvinyl acetate emulsion.
 - 1) Devoe:20XX Wonder Guard Exterior Acrylic Latex Flat Masonry Paint.
 - 2) Fuller:263-XX Flat Latex House Paint.
 - 3) Glidden:3525 Spred Glide-On.
 - 4) Moore:Moore's Flat Exterior Latex Masonry & House Paint #105.
 - 5) PPG:37 Line Cementhide Latex Masonry Paint.
 - 6) P & L:Pro-Hide Plus Interior/Exterior Vinyl-Acrylic Flat Paint Z3400 Series.
 - 7) S-W:Weather Perfect Acrylic Latex Flat Exterior Finish B-36 Series.
- C. Concrete Masonry Units:
 - 1. Lusterless (Flat) Acrylic Finish: Two coats over block filler with total dry film thickness not less than 2.5 mils, excluding the block filler.
 - a. Block Filler: High-performance, latex block filler.
 - 1) Devoe:52901 Bloxfil Interior/Exterior Acrylic Latex Block Filler.
 - 2) Fuller:280-00 Interior/Exterior Latex Block Filler.
 - 3) Glidden:5317 Ultra-Hide Acrylic Latex Block Filler.
 - 4) Moore: Moorcraft Interior & Exterior Block Filler #173.
 - 5) PPG:6-7 Latex Masonry Block Filler.
 - 6) P & L:Pro-Hide Plus Block Filler.
 - 7) S-W:Heavy-Duty Block Filler B42W46.
 - b. First and Second Coats: Exterior acrylic emulsion.
 - 1) Devoe:15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - 2) Fuller:262-XX 100% Acrylic Exterior Flat Finish.
 - 3) Glidden:3525 Spred Glide-On.
 - 4) Moore:Moore's Flat Exterior Latex Masonry & House Paint #105.
 - 5) PPG:72 Line Sun-Proof Acrylic Latex House Paint.
 - 6) P & L:Vapex Latex Flat House Paint.
 - 7) S-W:A-100 Acrylic Latex Flat Exterior Finish A-6 Series.

- D. Mineral-Fiber-Reinforced Cement Panels:
 - 1. Lusterless (Flat) Acrylic Finish: Two finish coats over primer with total dry film thickness not less than 3.5 mils.
 - a. Primer: Exterior primer coating.
 - 1) Devoe:1102 All-Weather Alkyd House Paint Primer.
 - 2) Fuller:220-23 Exterior Wood and Masonry Primer.
 - 3) Glidden:1951 Spred Gel-Flo Base Coat.
 - 4) Moore:Moorwhite Primer #100.
 - 5) P & L:Permalize Exterior Primer.
 - b. First and Second Coats: Exterior acrylic emulsion.
 - 1) Devoe:15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - 2) Fuller:262-XX 100% Acrylic Exterior Flat Finish.
 - 3) Glidden:3525 Spred Glide-On.
 - 4) Moore:Moore's Flat Exterior Latex Masonry & House Paint #105.
 - 5) PPG:72 Line Sun-Proof Acrylic Latex House Paint.
 - 6) P & L:Vapex Latex Flat House Paint.
 - 7) S-W:A-100 Acrylic Latex Flat Exterior Finish A-6 Series.
- E. Wood:
 - 1. Gloss Alkyd Finish: Two finish coats over primer with total dry film thickness not less than 3.5 mils.
 - a. Primer: Exterior primer coating.
 - 1) Devoe:1102 All-Weather Alkyd House Paint Primer.
 - 2) Fuller:220-23 Exterior Wood and Masonry Primer.
 - 3) Glidden:1951 Spred Gel-Flo Base Coat.
 - 4) Moore: Moorwhite Primer #100.
 - 5) PPG:1-70 or 1-870 Sun-Proof Exterior Wood Primer.
 - 6) P & L:Permalize Exterior Primer.
 - 7) S-W:A-100 Exterior Alkyd Wood Primer Y24W20.
 - b. First and Second Coats: Gloss alkyd enamel.
 - 1) Devoe:70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - 2) Fuller:312-XX EPA Compliant Heavy Duty Enamel.
 - 3) Glidden:4500 Glid-Guard Industrial Enamel.
 - 4) Moore: Impervo High-Gloss Enamel #133.
 - 5) PPG:54 Line Quick-Dry Enamel.
 - 6) P & L:Effecto Enamel.
 - 7) S-W:Industrial Enamel B-54 Series.
 - 2. Low-Luster Finish: Two finish coats over primer.
 - a. Primer: Exterior primer coating.
 - 1) Devoe:1102 All-Weather Alkyd House Paint Primer.
 - 2) Fuller:220-23 Exterior Wood and Masonry Primer.
 - 3) Glidden:1951 Spred Gel-Flo Base Coat.
 - 4) Moore:Moorwhite Primer #100.

- 5) PPG:1-70 or 1-870 Sun-Proof Exterior Wood Primer.
- 6) P & L:Permalize Exterior Primer.
- 7) S-W:A-100 Exterior Alkyd Wood Primer Y24W20.
- b. First and Second Coats: Exterior acrylic emulsion.
 - 1) Devoe:15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - 2) Fuller:667-XX Ful-Stain Flat Latex House Paint.
 - 3) Glidden: 3600 Spred House Paint.
 - 4) Moore: Moorgard Latex House Paint #103.
 - 5) PPG:72 Line Sun-Proof Acrylic Latex House Paint.
 - 6) P & L:Vapex Latex Flat House Paint.
 - 7) S-W:A100 Acrylic Latex Flat Exterior Finish A-6 Series.
- F. Wood Trim:
 - 1. Deep-Color, High-Gloss Alkyd Finish: Two finish coats over primer.
 - a. Primer: Exterior primer coating.
 - 1) Devoe:1102 All-Weather Alkyd House Paint Primer.
 - 2) Fuller:220-23 Exterior Wood and Masonry Primer.
 - 3) Glidden:1951 Spred Gel-Flo Base Coat.
 - 4) Moore: Moorwhite Deep Color Base #100-04.
 - 5) PPG:1-70 or 1-870 Sun-Proof Exterior Wood Primer.
 - 6) P & L:Permalize Exterior Primer.
 - 7) S-W:A-100 Exterior Alkyd Wood Primer Y24W20.
 - b. First and Second Coats: Deep-color, exterior, alkyd resin trim paint.
 - 1) Devoe:155 All-Weather Exterior Alkyd Gloss House and Trim Paint Ultra Deep Base.
 - 2) Fuller:660-XX Weather King Alkyd House & Trim Paint.
 - 3) Glidden:1901 Spred Dura Gloss Oil House Paint.
 - 4) Moore: Moore's House Paint #110.
 - 5) PPG:1 Line Sun-Proof Deeptone or Rustic Base Wood Finish.
 - 6) P & L:Effecto Enamel.
 - 7) S-W:SWP Exterior Gloss Finish A-2 Series.
 - 2. Medium-Shade, High-Gloss Alkyd Finish: Two finish coats over primer.
 - a. Primer: Exterior primer coating.
 - 1) Devoe:1102 All-Weather Alkyd House Paint Primer.
 - 2) Fuller:220-23 Exterior Wood and Masonry Primer.
 - 3) Glidden:1951 Spred Gel-Flo Base Coat.
 - 4) Moore:Moorwhite Primer #100.
 - 5) PPG:1-70 or 1-870 Sun-Proof Exterior Wood Primer.
 - 6) P & L:Permalize Exterior Primer.
 - 7) S-W:A-100 Exterior Alkyd Wood Primer Y24W20.
 - b. First and Second Coats: Medium-shade, ready-mixed exterior oil paint.
 - 1) Devoe:1XX All-Weather Alkyd Gloss House and Trim Paint.
 - 2) Fuller:660-XX Weather King Alkyd House & Trim Paint.
 - 3) Glidden:1901 Spred Dura Gloss Oil House Paint.
 - 4) Moore:Moore's House Paint #110.
 - 5) PPG:1 Line Sun-Proof Midtone Base Wood Finish.

- 6) P & L:Effecto Enamel.
- 7) S-W:SWP Exterior Gloss Paint A-2 Series.
- G. Wood Shakes and Rough Siding:
 - Low-Luster Finish: Two coats.
 - a. First and Second Coats: Alkyd-oil paint, wood shakes and rough siding.
 - 1) Devoe:94XX All-Weather Alkyd Solid Color Stain.
 - 2) Fuller: Ful-Stain Solid Cote Oil Stain.
 - 3) Glidden:9700 Endurance Oil Stain.
 - 4) Moore: Moorwood Solid Color Stain.
 - 5) PPG:77-600 Series Rez Solid Color Alkyd-Oil Stain.
 - 6) P & L:Solid-Hide Rustic Stain Finish.
 - 7) S-W:Exterior Solid Stain A-14 Series.
- H. Plywood:

1.

- 1. Lusterless (Flat) Acrylic Finish: Two finish coats over primer and sealer.
 - a. Sealer: Varnish-type surface sealer.
 - 1) Devoe:1502 Wonder Shield Exterior Acrylic Latex House Paint Primer.
 - 2) Glidden: 3651 Spred House Paint Prime Coat.
 - 3) PPG:77-1 Rez Sealer Primer.
 - 4) P & L:Varmor Penetrating Sealer.
 - 5) S-W:Chek Gard Primer B42W10.
 - b. Primer: Exterior primer coating.
 - 1) Devoe:1102 All-Weather Alkyd House Paint Primer.
 - 2) Fuller:220-08 Exterior Latex Wood Primer.
 - 3) Glidden: 3651 Spred House Paint Prime Coat.
 - 4) Moore: Moorwhite Primer #100.
 - 5) PPG:1-70 or 1-870 Sun-Proof Exterior Wood Primer.
 - 6) P & L:Permalize Exterior Primer.
 - 7) S-W:A-100 Exterior Alkyd Wood Primer Y24W20.
 - c. First and Second Coats: Exterior acrylic emulsion.
 - 1) Devoe:15XX Wonder-Shield Exterior Acrylic Latex Flat House Paint.
 - 2) Fuller:667-XX Ful-Stain Flat Latex House Paint.
 - 3) Glidden: 3600 Spred House Paint.
 - 4) Moore: Moorgard Latex House Paint #103.
 - 5) PPG:72 Line Sun-Proof Acrylic Latex House Paint.
 - 6) P & L:Vapex Latex Flat House Paint.
 - 7) S-W:A100 Acrylic Latex Flat Exterior Finish A-6 Series.
- I. Stained Wood:
 - 1. Flat Stain, No Finish: One coat.
 - a. First Coat: Exterior, semi-transparent oil stain.
 - 1) Devoe:9000 All Weather Semi-Transparent Alkyd Stain and Wood Preservative.

- 2) Fuller:645-XX Ful-Stain Semi-Transparent Stain.
- 3) Glidden:9721 Line Endurance Oil Semi-Transparent Stain.
- 4) Moore:Moorwood Semi-Transparent Stain and Wood Preservative 081.
- 5) PPG:77-860, 900 Series Rez Semi-Transparent Wood reservative and Water-Repellent Stain, Alkyd Oil Type.
- 6) P & L:Penetrating Rustic Stain.
- 7) S-W:Exterior Semi-Transparent Stain A-14 Series.
- J. Ferrous Metal: Primer is not required on shop-primed items.
 - 1. Full-Gloss Alkyd Enamel: Two finish coats over primer.
 - a. Primer: Synthetic rust-inhibiting primer.
 - 1) Devoe:14920 Bar-Ox Quick Dry Metal Primer, Red.
 - 2) Fuller:621-04 Blox-Rust Alkyd Metal Primer.
 - 3) Glidden:5210 Glid-Guard Universal Fast-Dry Metal Primer.
 - 4) Moore: IronClad Retardo Rust-Inhibitive Paint #163.
 - 5) PPG:6-208 Red Inhibitive Metal Primer.
 - 6) P & L:Effecto Rust-Inhibiting Primer.
 - 7) S-W:Kem Kromik Metal Primer B50N2/B50W1.
 - b. First and Second Coats: Gloss alkyd enamel.
 - 1) Devoe:70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - 2) Fuller:312-XX EPA Compliant Heavy Duty Enamel.
 - 3) Glidden:4500 Glid-Guard Industrial Enamel.
 - 4) Moore: Impervo High-Gloss Enamel #133.
 - 5) PPG:54 Line Quick-Dry Enamel.
 - 6) P & L:Effecto Enamel.
 - 7) S-W:Industrial Enamel B-54 Series.
 - 2. Lusterless Alkyd Enamel: Two finish coats over primer.
 - a. Primer: Synthetic rust-inhibiting primer.
 - 1) Devoe:14920 Bar-Ox Quick Dry Metal Primer, Red.
 - 2) Moore: IronClad Retardo Rust-Inhibitive Paint #163.
 - 3) PPG:6-208 Red Inhibitive Metal Primer.
 - 4) S-W:Kem Kromik Metal Primer B50N2/B50W1.
 - b. First and Second Coats: Lusterless alkyd enamel.
 - 1) Devoe:564XX De-Vo-Ko Lo-Lustre Alkyd H.P.
 - 2) Moore: Moore's PentaFlex Flat House Paint #114.
 - 3) PPG:50-52 Snolite Exterior Alkyd Flat House Paint.
 - 4) S-W:ProMar Alkyd Flat Exterior Finish B38 Series.
 - 3. Deep-Color, High-Gloss Alkyd Trim Enamel: Two coats over primer.
 - a. Primer: Alkyd-type primer.
 - 1) Devoe:41820 Bar-Ox Alkyd Shop/Field Primer Grey.
 - 2) Fuller:621-05 Blox-Rust Latex Metal Primer.
 - 3) Glidden:5205 Glid-Guard Tank and Structural Primer.
 - 4) Moore: IronClad Retardo Rust-Inhibitive Paint #163.
 - 5) PPG:6-612 Speedhide Inhibitive White Primer.
 - 6) P & L:Effecto Primer Red or White.
 - 7) S-W:Kem Kromik Metal Primer B50N2/B50W1.

- b. First and Second Coats: Deep-color, exterior, alkyd resin trim paint.
 - 1) Devoe:155 All-Weather Exterior Alkyd Gloss House and Trim Paint Ultra Deep Base.
 - 2) Fuller:660-XX Weather King Alkyd House & Trim Paint.
 - 3) Glidden:1901 Spred Dura Gloss Oil House Paint.
 - 4) Moore:Moore's House Paint #110.
 - 5) PPG:1 Line Sun-Proof Deeptone or Rustic Base Wood \ Finish.
 - 6) P & L:Effecto Enamel.
 - 7) S-W:SWP Exterior Gloss Finish A-2 Series.
- K. Zinc-Coated Metal:
 - 1. High-Gloss Alkyd Enamel: Two finish coats over primer.
 - a. Primer: Galvanized metal primer.
 - 1) Devoe:13201 Mirrolac Galvanized Metal Primer.
 - 2) Fuller:621-05 Blox-Rust Latex Metal Primer.
 - 3) Glidden:5229 Glid-Guard All-Purpose Metal Primer.
 - 4) Moore: IronClad Galvanized Metal Latex Primer #155.
 - 5) PPG:6-215/216 Speedhide Galvanized Steel Primer.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Galvite B50W3.
 - b. First and Second Coats: Gloss alkyd enamel.
 - 1) Devoe:70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - 2) Fuller:312-XX EPA Compliant Heavy Duty Enamel.
 - 3) Glidden:4500-Line Glid-Guard Industrial Enamel.
 - 4) Moore:Impervo High-Gloss Enamel #133.
 - 5) PPG:54 Line Quick-Dry Enamel.
 - 6) P & L:Effecto Enamel.
 - 7) S-W:Industrial Enamel B-54 Series.
- L. Aluminum:
 - 1. High-Gloss Alkyd Enamel: Two finish coats over primer.
 - a. Primer: Alkyd-type primer.
 - 1) Devoe:41820 Bar-Ox Alkyd Shop/Field Primer Grey.
 - 2) Fuller:621-05 Blox-Rust Latex Metal Primer.
 - 3) Glidden:5229 Glid-Guard All-Purpose Metal Primer.
 - 4) Moore:No Primer Required.
 - 5) PPG:6-712 Speedhide Inhibitive Metal Primer, White.
 - 6) P & L:Effecto Primer Red or White.
 - 7) S-W:No Primer Necessary.
 - b. First and Second Coats: Gloss alkyd enamel.
 - 1) Devoe:70XX Mirrolac Interior/Exterior Alkyd-Urethane Gloss Enamel.
 - 2) Fuller:312-XX EPA Compliant Heavy Duty Enamel.
 - 3) Glidden:4500-Line Glid-Guard Industrial Enamel.
 - 4) Moore:Impervo High-Gloss Enamel #133.
 - 5) PPG:54 Line Quick-Dry Enamel.

- 6) P & L:Effecto Enamel.
- 7) S-W:Industrial Enamel B-54 Series.

3.8 INTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates, as indicated.
- B. Concrete and Masonry (other than concrete masonry units):
 - 1. Lusterless (Flat) Latex Finish: Two coats.
 - a. First and Second Coats: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:602XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore:Regal Wall Satin #215.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Classic 99 Wall and Trim Paint A27W10.
 - 2. Lusterless (Flat), Odorless, Latex Finish: Two coats.
 - a. Primer: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:202-XX Interior-Exterior Acrylic Latex Wall Paint.
 - 3) Glidden:5300 Ultra-Hide Flat Wall Paint.
 - 4) Moore:Moore's Latex Quick-Dry Prime Seal #201.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Pro-Mar 200 Latex Flat B30W200.
 - b. Second Coat: Interior, flat, odorless, alkyd paint.
 - 1) Devoe:21XX Velour Alkyd Flat Wall Paint.
 - 2) Fuller:101XX Liquid Velvet Alkyd Flat Wall Paint.
 - 3) Glidden:5700 Ultra-Hide Alkyd Flat Wall Enamel.
 - 4) Moore:Moore's Alkyd Sani-Flat #204.
 - 5) PPG:6-50 Series Speedhide Alkyd Flat Wall Paint.
 - 6) P & L:Lyt-All Flowing Flat.
 - 7) S-W:Pro-Mar 200 Alkyd Flat Wall Paint B32W101.
 - 3. Semigloss Enamel Finish: Three coats with total dry film thickness not less than 3.5 mils.
 - a. Primer: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:202-XX Interior-Exterior Acrylic Latex Wall Paint.
 - 3) Glidden:5300 Ultra-Hide Flat Wall Paint.
 - 4) Moore:Moore's Latex Quick-Dry Prime Seal #201.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Pro-Mar 200 Latex Flat B30W200.
 - b. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.

- 2) Fuller:220-06 Interior Alkyd Wall Primer Sealer.
- 3) Glidden:4200 Spred Ultra Semi-Gloss Enamel.
- 4) Moore:Moore's Alkyd Enamel Underbody #217.
- 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
- 6) P & L:E6 Enamel Undercoater.
- 7) S-W:Pro-Mar 200 Latex Wall Primer B28W200.
- c. Finish Coat: Interior, semigloss, odorless, alkyd enamel.
 - 1) Devoe:26XX Velour Alkyd Semigloss Enamel.
 - 2) Fuller:110XX Fullerglo Alkyd Semigloss Enamel.
 - 3) Glidden:4200 Spred Ultra Semigloss Enamel.
 - 4) Moore: Moore's Satin Impervo Enamel #235.
 - 5) PPG:27 Line Wallhide Semigloss Enamel.
 - 6) P & L:Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W:Classic 99 Semigloss Enamel A40 Series.
- C. Concrete Masonry Units:
 - 1. Lusterless (Flat) Emulsion Finish: Two finish coats over filled surface.
 - a. Block Filler: High-performance latex block filler.
 - 1) Devoe:52901 Bloxfil Acrylic Latex Block Filler.
 - 2) Fuller:280-00 Interior/Exterior Latex Block Filler.
 - 3) Glidden:5317 Ultra-Hide Acrylic Latex Block Filler.
 - 4) Moore: Moorcraft Interior & Exterior Block Filler #173.
 - 5) PPG:6-7 Latex Masonry Block Filler.
 - 6) P & L:Pro-Hide Plus Block Filler.
 - 7) S-W:Heavy-Duty Block Filler B42W46.
 - b. First and Second Coats: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:602XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore:Regal Wall Satin #215.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Classic 99 Wall and Trim Paint A27W10.
 - 2. Semigloss, Alkyd, Enamel Finish: Two coats over filled surface with total dry film thickness not less than 3.5 mils, excluding filler coat.
 - a. Block Filler: High-performance latex block filler.
 - 1) Devoe:52901 Bloxfil Acrylic Latex Block Filler.
 - 2) Fuller:280-00 Interior/Exterior Latex Block Filler.
 - 3) Glidden:5317 Ultra-Hide Acrylic Latex Block Filler.
 - 4) Moore: Moorcraft Interior & Exterior Block Filler #173.
 - 5) PPG:6-7 Latex Masonry Block Filler.
 - 6) P & L:Pro-Hide Plus Block Filler.
 - 7) S-W:Heavy-Duty Block Filler B42W46.
 - b. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.
 - 2) Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden:4200 Spred Ultra Semi-Gloss Enamel.
 - 4) Moore:Moore's Alkyd Enamel Underbody #217.

- 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
- 6) P & L:Interior Trim Primer.
- 7) S-W:Pro-Mar 200 Latex Wall Primer B28W200.
- c. Finish Coat: Interior, semigloss, odorless, alkyd enamel.
 - 1) Devoe:26XX Velour Alkyd Semigloss Enamel.
 - 2) Fuller:110XX Fullerglo Alkyd Semigloss Enamel.
 - 3) Glidden:4200 Spred Ultra Semigloss Enamel.
 - 4) Moore: Moore's Satin Impervo Enamel #235.
 - 5) PPG:27 Line Wallhide Semigloss Enamel.
 - 6) P & L:Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W:Classic 99 Semigloss Enamel A40 Series.
- D. Mineral-Fiber-Reinforced Cement Panels:
 - 1. Lusterless (Flat) Emulsion Finish: Two coats.
 - a. First and Second Coats: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:602XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore:Regal Wall Satin #215.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Classic 99 Wall and Trim Paint A27W10.
- E. Gypsum Drywall Systems:
 - 1. Lusterless (Flat) Emulsion Finish: Two coats.
 - a. Primer: White, interior, latex-based primer.
 - 1) Devoe:50801 Wonder-Tones Latex Primer and Sealer.
 - 2) Fuller: Pro-Tech Interior Latex Wall Primer and Sealer.
 - 3) Glidden:5019 PVA Primer.
 - 4) Moore:Moore's Latex Quick-Dry Prime Seal #201.
 - 5) PPG:6-2 Quick-Dry Latex Primer Sealer.
 - 6) P & L:Latex Wall Primer Z30001.
 - 7) S-W:Pro-Mar 200 Latex Wall Primer B28W200.
 - b. Finish Coat: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:602XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore:Regal Wall Satin #215.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Classic 99 Wall and Trim Paint A27W10.
 - 2. Odorless Semigloss Alkyd Enamel Finish: Three coats with total dry film thickness not less than 2.5 mils.
 - a. Primer: White, interior, latex-based primer.
 - 1) Devoe:50801 Wonder-Tones Latex Primer and Sealer.
 - 2) Fuller: Pro-Tech Interior Latex Wall Primer and Sealer.
 - 3) Glidden:5019 PVA Primer.
 - 4) Moore:Moore's Latex Quick-Dry Prime Seal #201.

- 5) PPG:6-2 Quick-Dry Latex Primer Sealer.
- 6) P & L:Latex Wall Primer Z30001.
- 7) S-W:Pro-Mar 200 Latex Wall Primer B28W200.
- b. First and Second Coats: Interior, semigloss, odorless, alkyd enamel.
 - 1) Devoe:26XX Velour Alkyd Semigloss Enamel.
 - 2) Fuller:110XX Fullerglo Alkyd Semigloss Enamel.
 - 3) Glidden:4200 Spred Ultra Semigloss Enamel.
 - 4) Moore: Moore's Satin Impervo Enamel #235.
 - 5) PPG:27 Line Wallhide Semigloss Enamel.
 - 6) P & L:Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W:Classic 99 Semigloss Enamel A40 Series.
- F. Plaster:
 - 1. Lusterless (Flat) Emulsion Finish: Two coats.
 - a. Primer: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:Interior Latex Enamel Undercoater.
 - 3) Glidden:5019 PVA Primer Sealer.
 - 4) Moore: Moore's Latex Quick-Dry Prime Seal #201.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Wall and Wood Primer B49W2.
 - b. Finish Coat: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:602XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore:Regal Wall Satin #215.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Classic 99 Wall and Trim Paint A27W10.
 - 2. Odorless Lusterless (Flat) Latex Finish: Two coats.
 - a. Primer: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:Interior Latex Enamel Undercoater.
 - 3) Glidden:5019 PVA Primer Sealer.
 - 4) Moore:Moore's Latex Quick-Dry Prime Seal #201.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Wall and Wood Primer B49W2.
 - b. Finish Coat: Interior, flat, odorless, alkyd paint.
 - 1) Devoe:21XX Velour Alkyd Flat Wall Paint.
 - 2) Fuller:101XX Liquid Velvet Alkyd Flat Wall Paint.
 - 3) Glidden:5700 Ultra-Hide Alkyd Flat Wall Enamel.
 - 4) Moore:Moore's Alkyd Sani-Flat #204.
 - 5) PPG:6-50 Series Speedhide Alkyd Flat Wall Paint.
 - 6) P & L:Lyt-All Flowing Flat.
 - 7) S-W:Pro-Mar 200 Alkyd Flat Wall Paint B32W101.

- 3. Semigloss Enamel Finish: Three coats with total dry film thickness not less than 2.5 mils.
 - a. Primer: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:Interior Latex Enamel Undercoater.
 - 3) Glidden:5019 PVA Primer Sealer.
 - 4) Moore:Moore's Latex Quick-Dry Prime Seal #201.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Wall and Wood Primer B49W2.
 - b. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.
 - 2) Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden:4200 Spred Ultra Semi-Gloss Enamel.
 - 4) Moore:Moore's Alkyd Enamel Underbody #217.
 - 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Wall and Wood Primer B49W2.
 - c. Finish Coat: Interior, semigloss, odorless, alkyd enamel.
 - 1) Devoe:26XX Velour Alkyd Semigloss Enamel.
 - 2) Fuller:110XX Fullerglo Alkyd Semigloss Enamel.
 - 3) Glidden:4200 Spred Ultra Semigloss Enamel.
 - 4) Moore: Moore's Satin Impervo Enamel #235.
 - 5) PPG:27 Line Wallhide Semigloss Enamel.
 - 6) P & L:Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W:Classic 99 Semigloss Enamel A40 Series.
- 4. Full-Gloss Enamel Finish: Three coats with total dry film thickness not less than 2.5 mils.
 - a. Primer: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:Interior Latex Enamel Undercoater.
 - 3) Glidden:5019 PVA Primer Sealer.
 - 4) Moore:Moore's Latex Quick-Dry Prime Seal #201.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Wall and Wood Primer B49W2.
 - b. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.
 - 2) Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden:4500 Glid-Guard Enamel.
 - 4) Moore:Moore's Alkyd Enamel Underbody #217.
 - 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Wall and Wood Primer B49W2.
 - c. Finish Coat: Exterior, gloss, alkyd enamel.
 - 1) Devoe:70XX Mirrolac Interior/Exterior Alkyd Gloss Enamel.

- 2) Fuller:312XX EPA Compliant Heavy Duty Enamel.
- 3) Glidden:4500 Glid-Guard Industrial Enamel.
- 4) Moore:Impervo High-Gloss Enamel #133.
- 5) PPG:54 Line Quick-Dry Enamel.
- 6) P & L:Effecto Enamel.
- 7) S-W:Industrial Enamel B-54 Series.
- G. Acoustical Plaster:
 - 1. Lusterless (Flat) Emulsion Finish: Two coats.
 - a. First and Second Coats: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:602XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore:Regal Wall Satin #215.
 - 5) PPG:50-35 Latex Ceiling Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Classic 99 Wall and Trim Paint A27W10.
- H. Woodwork and Hardboard:
 - 1. Semigloss Enamel Finish: Three coats.
 - a. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.
 - 2) Fuller:220-07 Interior Alkyd Enamel Undercoat
 - 3) Glidden: 310 Glidden Wood Undercoater.
 - 4) Moore:Moore's Alkyd Enamel Underbody #217.
 - 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Pro-Mar 200 Alkyd Enamel Undercoater B49W200.
 - b. First and Second Coats: Interior, semigloss, odorless, alkyd enamel.
 - 1) Devoe:26XX Velour Alkyd Semigloss Enamel.
 - 2) Fuller:110XX Fullerglo Alkyd Semigloss Enamel.
 - 3) Glidden:4200 Spred Ultra Semigloss Enamel.
 - 4) Moore: Moore's Satin Impervo Enamel #235.
 - 5) PPG:27 Line Wallhide Semigloss Enamel.
 - 6) P & L:Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W:Classic 99 Semigloss Enamel A40 Series.
 - 2. Full-Gloss Enamel Finish: Three coats.
 - a. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.
 - 2) Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden: 310 Glidden Wood Undercoater.
 - 4) Moore:Moore's Alkyd Enamel Underbody #217.
 - 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Pro-Mar 200 Alkyd Enamel Undercoater B49W200.
 - b. First and Second Coats: Gloss alkyd enamel.
 - 1) Devoe:70XX Mirrolac Interior/Exterior Alkyd Gloss Enamel.
 - 2) Fuller:312XX EPA Compliant Heavy Duty Enamel.
 - 3) Glidden:4500 Glid-Guard Industrial Enamel.

- 4) Moore: Impervo High-Gloss Enamel #133.
- 5) PPG:54 Line Quick-Dry Enamel.
- 6) P & L:Effecto Enamel.
- 7) S-W:Industrial Enamel B-54 Series.
- I. Stained Woodwork:
 - 1. Stained-Varnish Rubbed Finish: Three finish coats over stain plus filler on open-grain wood. Wipe filler before applying first varnish coat.
 - a. Stain Coat: Oil-type interior wood stain.
 - 1) Devoe:96XX Wonder Woodstain Alkyd Stain.
 - 2) Fuller:640-XX Pen-Chrome Interior Oil Base Wood Stain.
 - 3) Glidden:1600 Woodmaster Oil Stain.
 - 4) Moore:241 Moore's Interior Wood Finishes Penetrating Stain.
 - 5) PPG:77-302 Rez Medium Tint Base.
 - 6) P & L:S-Series Tonetic Wood Stain.
 - 7) S-W:Oil Stain A-48 Series.
 - b. First Coat: Cut shellac.
 - 1) Devoe:4900 Wonder Woodsealer Quick-Dry Sealer.
 - 2) Glidden: 5035 Ultra-Hide Sanding Sealer.
 - 3) Moore:413 Moore's Interior Wood Finishes Quick-Dry Sanding Sealer.
 - 4) PPG:77-30 Quick Drying Sanding Sealer.
 - 5) S-W:Pro-Mar Varnish Sanding Sealer B26V3.
 - c. Filler Coat: Paste wood filler.
 - 1) Devoe:4800 Wonder Woodstain Interior Paste Wood Filler.
 - 2) Fuller:680-00 Pen Chrome Paste Wood Filler.
 - 3) Glidden:Glidden Paste Wood Filler.
 - 4) Moore:Benwood Paste Wood Filler #238.
 - 5) PPG:(none required)
 - 6) S-W:Sher-Wood Fast-Dry Filler.
 - d. Second and Third Coats: Oil rubbing varnish.
 - 1) Devoe:4600 Wonder Wood Satin Alkyd Satin Varnish.
 - 2) Fuller:653-01 EPA Compliant Clear Polyurethane Satin Finish.
 - 3) Glidden:82 Woodmaster Satin Sheen Urethane Varnish.
 - 4) Moore:Benwood Satin Finish Varnish #404.
 - 5) PPG:77-7 Rez Satin Varnish.
 - 6) P & L:Clear Finish Gloss.
 - 7) S-W:Oil Base Varnish, Gloss A66V91.
 - 2. Stained-Wax Polished Finish: Four finish coats over stain.
 - a. Stain Coat: Oil-type interior wood stain.
 - 1) Devoe:96XX Wonder Woodstain Alkyd Stain.
 - 2) Fuller:640-XX Pen-Chrome Interior Oil Base Wood Stain.
 - 3) Glidden:1600 Woodmaster Oil Stain.
 - 4) Moore:241 Moore's Interior Wood Finishes Penetrating Stain.
 - 5) PPG:77-302 Rez Medium Tint Base.
 - 6) P & L:S-Series Tonetic Wood Stain.
 - 7) S-W:Oil Stain A-48 Series.

- b. First Coat: Cut shellac.
 - 1) Devoe:4900 Wonder Woodsealer Quick-Dry Sealer.
 - 2) Glidden:5035 Ultra-Hide Sanding Sealer.
 - 3) Moore:413 Moore's Interior Wood Finishes Quick-Dry Sanding Sealer.
 - 4) PPG:77-30 Quick Drying Sanding Sealer.
 - 5) S-W:Pro-Mar Varnish Sanding Sealer B26V3.
- c. Second, Third, and Fourth Coats: Paste wax.
- J. Natural-Finish Woodwork:
 - 1. Rubbed Varnish Finish: Two finish coats over shellac plus filler on open-grain wood.
 - a. First Coat: Cut shellac.
 - 1) Devoe:4900 Wonder Woodsealer Quick-Dry Sealer.
 - 2) Glidden:5035 Ultra-Hide Sanding Sealer.
 - 3) Moore:413 Moore's Interior Wood Finishes Quick-Dry Sanding Sealer.
 - 4) PPG:77-30 Quick Drying Sanding Sealer.
 - 5) S-W:Pro-Mar Varnish Sanding Sealer B26V3.
 - b. Filler Coat: Paste wood filler.
 - 1) Devoe:4800 Wonder Woodstain Interior Paste Wood Filler.
 - 2) Fuller:680-00 Pen Chrome Paste Wood Filler.
 - 3) Glidden:Glidden Paste Wood Filler.
 - 4) Moore:Benwood Paste Wood Filler #238.
 - 5) PPG:(none required)
 - 6) S-W:Sher-Wood Fast-Dry Filler.
 - c. Second and Third Coats: Oil rubbing varnish.
 - 1) Devoe:4600 Wonder Wood Satin Alkyd Satin Varnish.
 - 2) Fuller:653-01 EPA Compliant Clear Polyurethane Satin Finish.
 - 3) Glidden:82 Woodmaster Satin Sheen Urethane Varnish.
 - 4) Moore:Benwood Satin Finish Varnish #404.
 - 5) PPG:77-7 Rez Satin Varnish.
 - 6) P & L:Clear Finish Gloss.
 - 7) S-W:Oil Base Varnish, Gloss A66V91.
 - 2. Polished Wax Finish: Four coats.
 - a. First Coat: Cut shellac.
 - 1) Devoe:4900 Wonder Woodsealer Quick-Dry Sealer.
 - 2) Glidden:5035 Ultra-Hide Sanding Sealer.
 - 3) Moore:413 Moore's Interior Wood Finishes Quick-Dry Sanding Sealer.
 - 4) PPG:77-30 Quick Drying Sanding Sealer.
 - 5) S-W:Pro-Mar Varnish Sanding Sealer B26V3.
 - b. Second, Third, and Fourth Coats: Paste wax.
- K. Ferrous Metal:
 - 1. Lusterless (Flat) Finish: Two finish coats over primer with total dry film

thickness not less than 2.5 mils.

- a. Primer: Synthetic, quick-drying, rust-inhibiting primer.
 - 1) Devoe:14920 Bar-Ox Quick Dry Metal Primer, Red.
 - 2) Fuller:621-04 Blox-Rust Alkyd Metal Primer.
 - 3) Glidden:5210 Glid-Guard Universal Fast-Dry Metal Primer.
 - 4) Moore: Ironclad Retardo Rust-Inhibitive Paint #163.
 - 5) PPG:6-208 Red Inhibitive Metal Primer.
 - 6) P & L:Effecto Rust-Inhibiting Primer.
 - 7) S-W:Kem Kromik Metal Primer B50N2/B50W1.
- b. First and Second Coats: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:602XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore:Regal Wall Satin #215.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Classic 99 Wall and Trim Paint A27W10.
- 2. Semigloss Enamel Finish: Two coats over primer with total dry film thickness not less than 2.5 mils.
 - a. Primer: Synthetic, quick-drying, rust-inhibiting primer.
 - 1) Devoe:14920 Bar-Ox Quick Dry Metal Primer, Red.
 - 2) Fuller:621-04 Blox-Rust Alkyd Metal Primer.
 - 3) Glidden:5210 Glid-Guard Universal Fast-Dry Metal Primer.
 - 4) Moore: Ironclad Retardo Rust-Inhibitive Paint #163.
 - 5) PPG:6-208 Red Inhibitive Metal Primer.
 - 6) P & L:Effecto Rust-Inhibiting Primer.
 - 7) S-W:Kem Kromik Metal Primer B50N2/B50W1.
 - b. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.
 - 2) Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden:4200 Spred Ultra Semi-Gloss Enamel.
 - 4) Moore:Moore's Alkyd Enamel Underbody #217.
 - 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Pro-Mar 200 Alkyd Enamel Undercoater B49W200.
 - c. Finish Coat: Interior, semigloss, odorless, alkyd enamel.
 - 1) Devoe:26XX Velour Alkyd Semigloss Enamel.
 - 2) Fuller:110XX Fullerglo Alkyd Semigloss Enamel.
 - 3) Glidden:4200 Spred Ultra Semigloss Enamel.
 - 4) Moore: Moore's Satin Impervo Enamel #235.
 - 5) PPG:27 Line Wallhide Semigloss Enamel.
 - 6) P & L:Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W:Classic 99 Semigloss Enamel A40 Series.
- 3. Full-Gloss Enamel Finish: Two coats over primer with total dry film thickness not less than 2.5 mils.
 - a. Primer: Synthetic, quick-drying, rust-inhibiting primer.
 - 1) Devoe:14920 Bar-Ox Quick Dry Metal Primer, Red.
 - 2) Fuller:621-04 Blox-Rust Alkyd Metal Primer.

- 3) Glidden:5210 Glid-Guard Universal Fast-Dry Metal Primer.
- 4) Moore: Ironclad Retardo Rust-Inhibitive Paint #163.
- 5) PPG:6-208 Red Inhibitive Metal Primer.
- 6) P & L:Effecto Rust-Inhibiting Primer.
- 7) S-W:Kem Kromik Metal Primer B50N2/B50W1.
- b. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.
 - 2) Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden:4500 Glid-Guard Alkyd Enamel.
 - 4) Moore: Moore's Alkyd Enamel Underbody #217.
 - 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Pro-Mar 200 Alkyd Enamel Undercoater B49W200.
- c. Finish Coat: Exterior, gloss, alkyd enamel.
 - 1) Devoe:70XX Mirrolac Interior/Exterior Alkyd Gloss Enamel.
 - 2) Fuller:312XX EPA Compliant Heavy Duty Enamel.
 - 3) Glidden:4500 Glid-Guard Industrial Enamel.
 - 4) Moore:Impervo High-Gloss Enamel #133.
 - 5) PPG:54 Line Quick-Dry Enamel.
 - 6) P & L:Effecto Enamel.
 - 7) S-W:Industrial Enamel B-54 Series.
- L. Zinc-Coated Metal:
 - 1. Lusterless (Flat) Finish: Two finish coats over primer with total dry film thickness not less than 2.5 mils.
 - a. Primer: Galvanized metal primer.
 - 1) Devoe:13201 Mirrolac Galvanized Metal Primer.
 - 2) Fuller:621-05 Blox-Rust Latex Metal Primer.
 - 3) Glidden:5229 Glid-Guard All-Purpose Metal Primer.
 - 4) Moore: Ironclad Galvanized Metal Latex Primer #155.
 - 5) PPG:6-215/216 Speedhide Galvanized Steel Primer.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Galvite B50W3.
 - b. First and Second Coats: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:602XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore:Regal Wall Satin #215.
 - 5) PPG:80 Line Wallhide Flat Latex Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Classic 99 Wall and Trim Paint A27W10.
 - 2. Semigloss Finish: Two coats over primer, with total dry film thickness not less than 2.5 mils.
 - a. Primer: Galvanized metal primer.
 - 1) Devoe:13201 Mirrolac Galvanized Metal Primer.
 - 2) Fuller:621-05 Blox-Rust Latex Metal Primer.
 - 3) Glidden:5229 Glid-Guard All-Purpose Metal Primer.
 - 4) Moore: Ironclad Galvanized Metal Latex Primer #155.

- 5) PPG:6-215/216 Speedhide Galvanized Steel Primer.
- 6) P & L:Interior Trim Primer.
- 7) S-W:Galvite B50W3.
- b. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.
 - 2) Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden:4200 Spred Ultra Semi-Gloss Enamel.
 - 4) Moore:Moore's Alkyd Enamel Underbody #217.
 - 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Pro-Mar 200 Alkyd Enamel Undercoater B49W200.
- c. Finish Coat: Interior, semigloss, odorless, alkyd enamel.
 - 1) Devoe:26XX Velour Alkyd Semigloss Enamel.
 - 2) Fuller:110XX Fullerglo Alkyd Semigloss Enamel.
 - 3) Glidden:4200 Spred Ultra Semigloss Enamel.
 - 4) Moore: Moore's Satin Impervo Enamel #235.
 - 5) PPG:27 Line Wallhide Semigloss Enamel.
 - 6) P & L:Cellu-Tone Alkyd Satin Enamel.
 - 7) S-W:Classic 99 Semigloss Enamel A40 Series.
- 3. Full-Gloss Enamel Finish: Two coats over primer with total dry film thickness not less than 2.5 mils.
 - a. Primer: Galvanized metal primer.
 - 1) Devoe:13201 Mirrolac Galvanized Metal Primer.
 - 2) Fuller:621-05 Blox-Rust Latex Metal Primer.
 - 3) Glidden:5229 Glid-Guard All-Purpose Metal Primer.
 - 4) Moore: Ironclad Galvanized Metal Latex Primer #155.
 - 5) PPG:6-215/216 Speedhide Galvanized Steel Primer.
 - 6) P & L:P & L Interior Trim Primer.
 - 7) S-W:Galvite B50W3.
 - b. Undercoat: Interior enamel undercoat.
 - 1) Devoe:8801 Velour Alkyd Enamel Undercoat.
 - 2) Fuller:220-07 Interior Alkyd Enamel Undercoat.
 - 3) Glidden:4500 Glid-Guard Alkyd Enamel.
 - 4) Moore: Moore's Alkyd Enamel Underbody #217.
 - 5) PPG:6-6 Speedhide Quick-Dry Enamel Undercoater.
 - 6) P & L:Interior Trim Primer.
 - 7) S-W:Pro-Mar 200 Alkyd Enamel Undercoater B49W200.
 - c. Finish Coat: Exterior, gloss, alkyd enamel.
 - 1) Devoe:70XX Mirrolac Interior/Exterior Alkyd Gloss Enamel.
 - 2) Fuller:312XX EPA Compliant Heavy Duty Enamel.
 - 3) Glidden:4500 Glid-Guard Industrial Enamel.
 - 4) Moore: Impervo High-Gloss Enamel #133.
 - 5) PPG:54 Line Quick-Dry Enamel.
 - 6) P & L:Effecto Ename I.
 - 7) S-W:Industrial Enamel B-54 Series.

- M. Cotton or Canvas Covering over Insulation:
 - 1. Flat Latex Emulsion Size: Two coats. Add fungicidal agent to render fabric mildewproof.
 - a. First and Second Coats: Interior, flat, latex-based paint.
 - 1) Devoe:36XX Wonder-Tones Latex Flat Wall Paint.
 - 2) Fuller:602XX Liquid Velvet Latex Wall Paint.
 - 3) Glidden: 3400 Spred Satin Latex Wall Paint.
 - 4) Moore:Regal Wall Satin #215.
 - 5) PPG:50-35 Latex Ceiling Paint.
 - 6) P & L:Vapex Latex Flat Wall Finish.
 - 7) S-W:Classic 99 Wall and Trim Paint A27W10.

END OF SECTION 09 90 00

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SECTION 09 91 00 - PAINTING

PART ONE - GENERAL:

- **1-01 <u>REQUIREMENTS</u>:** The requirements of all sections of Division One apply to work under this section.
- **1-02 SCOPE:** Include all emulsion, oil paints, alkalyde paints, sealers, stains, varnishes and similar coatings specified or necessary to provide resistance to weathering, protection from damage by corrosion, durability and economy of maintenance, an attractive finish and complete finish painting throughout the work. Colors combinations and patterns shall be as selected by the Architect.

1-03 WORK INCLUDED:

- A. Furnish labor and materials to complete painting and finishing work indicated, specified or both.
- B. Following specifications, cover complete painting, finishing of all unfinished items throughout interior and exterior of the building, except as otherwise specified.
- C. Furnish tools, ladders, scaffolding, other equipment necessary for work completion.
- D. Examine specifications for various other trades, become familiar with their provisions regarding their painting, paint of finish surfaces that are left unfinished by requirements of other sections.
- E. Do not paint or finish copper, bronze, chromium plate, nickel, stainless steel, aluminum, monel metal and fire rating labels on doors and frames except as otherwise specified.
- F. Woodwork, metal or any other surface to be finished that cannot be put in proper condition for finishing by customary cleaning, sanding, puttying operation, notify Architect in writing or assume the responsibility for and rectify any unsatisfactory finish resulting.
- **1-04 PRODUCT HANDLING:** Deliver materials in the original containers with seals unbroken and labels intact, except as otherwise provided herein. Take precautions in storing paint products to avoid spontaneous combustion.

1-05 JOB CONDITIONS:

A. Perform exterior painting only in favorable weather above 40 degrees F. with surfaces dry to the touch, clean and free of frost, except as otherwise recommended by the paint manufacturer for the specific project being applied.

- B. No interior painting final coats may be installed prior to the building having been made watertight and having controlled conditioning.
- C. Protect adjacent work and materials during progress of the Work. Upon completion of the Work, remove all paint products from the floor, glass and similar building surfaces not intended to receive paint.

PART TWO - PRODUCTS:

2-01 <u>QUALITY</u>: The quality of materials shall be <u>TOP QUALITY PROFESSIONAL</u> <u>PAINTERS GRADE</u>.

2-02 MATERIALS:

- A. Unless specified directly, all paint shall be acrylic waterbourne industrial enamel. Equal products are manufactured by DEVOE, GLIDDEN, PITTSBURG PLATE GLASS, ROSE TALBERT and SHERWIN WILLIAMS. No claim as to unsuitably or unavailability of any materials specified or unwillingness to use same, or inability to produce first-class work with same, will be entertained unless such claims are made in writing, submitted with the proposal. All surfaces shall be washable.
- B. Use materials only as specified by manufacturer's directions on label or container.
- C. Painting material such as linseed oil, shellac, turpentine, etc., pure, highest quality, bear identifying label on container.
- D. Base proposal on product use of one of the specified brands, quality, as specified. If Contractor desires to use materials other than specified, accompanying proposal with such request in writing for approval; give manufacturer's name, specified name of each product offered as a substitute. After award of Contract, no substitution of materials for those mentioned in accepted proposal will be permitted.
- E. Provide a 6' x 6' mock-up.
- F. Provide written documentation that products contain no lead or mercury.

PART THREE - EXECUTION:

3-01 WORKMANSHIP:

A. General Requirements: Workmanship; very best, spread materials evenly, flow on smoothly without run sags. Employ skilled mechanics. Clean surfaces to be painted including floors, free of loose dirt, dust, before painting is started. Do

necessary puttying of nail holes, cracks, etc., after first coat, with putty to match that of finish. Bring putty flush with adjoining surface in neat workmanlike manner. Wash metal surfaces with mineral spirits to remove any dirt, grease, before applying materials. Where rust or scale is present, use wire brushes, or sandpaper, clean before painting. Clean shop coats that become marred, touch up specified primer. Treat galvanized metal surface chemically with compound designed for this purpose as per manufacturer's directions for use before applying first coat of paint. Cut out scratches, cracks, abrasions in surfaces, openings, adjoining trim as required; fill with spackle or approved material, flush with adjoining surfaces; when dry, sand smooth, seal before priming coat application. Tint priming coat to approximate shade of final coat. Touch up section spots after first coat application before applying second coat to produce even result in finish coat. Secure color schedule approximate final coat shade. Sand smooth woodwork to be finished with enamel or varnish, clean surfaces before proceeding with first coat application. Use fine sandpaper between coats of enamel or varnish applied to wood or metal to produce even smooth finish. See that coats are thoroughly dry before applying succeeding specified coat, otherwise no credit for coat applied will be given. Contractor automatically assumes responsibility to re-coat work in guestion. Notify Architect when particular coat applied is complete ready for inspection. Finish door tops, bottoms, edges, same as balance of doors after they are fitted under "Carpentry" section. Where interior or exterior wood or metal is primed in mill, or shop, use material in every case same as that specified for such surfaces; use as per manufacturer's directions for first or priming coat. IT IS TO BE CLEARLY UNDERSTOOD THAT THE BLOCK FILL SHALL BE BRUSHED OR ROLLED ON (NO SPRAYING WILL BE ALLOWED). Protect all times; protect adjacent work, materials, by suitable covering or other methods during work progress. Upon completion of work, remove paint, varnish, varnish spots, from floor, glass, other surfaces; remove from premise rubbish accumulated materials of whatever nature not caused by other trades; leave work clean, acceptable condition.

3-02 COVERAGE: The number of coats listed below are as a guide only; therefore, this contractor is responsible for applying necessary coats for full coverage.

3-03 INTERIOR PAINTING:

- A. Woodwork Trim Doors, Millwork, Casework and Storage Shelving: Natural finished, stained or painted finish as directed.
 - (1) Natural Finish: Seal and apply two coats of rubbing varnish.
 - (2) Stained Finish: Oil type wood stain color as directed and apply two coats of rubbing varnish.
 - (3) Painted Finish: Prime and apply two coats of semi-gloss enamel.
 - (4) Exposed Metal Deck and Exposed Joists: Exposed metal decking and exposed joists shall be painted with three coats of acrylic latex paint, after prime coat of Zinc Chromate primer.

- B. Ferrous Metal Surfaces: Apply two coats of semi-gloss over shop prime coat. This includes but not limited to exposed bar joists, metal deck, bridging, conduit and piping.
- C. Painted Concrete Floors: Apply two coats, color as selected, of H & C Silicon Acrylic Concrete Stain as distributed by Sherwin Williams Company. Install in strict accordance with the manufacturer's printed specifications.
- D. Exposed Wood Fiber Reinforced Cementious Deck Roof Slabs Over Gymnasium: Two coats of flat oil or laytex white paint formulated for this use.
- E. Concrete Block:
 - Unless otherwise indicated: One (1) coat #250 Bondaplex acrylic primer and #3550 block filler, roller applied, 10 mils <u>and</u> two (2) coats AWB 1 Enamel #8600, with washable surface.
 - (2) Epoxy Painted Where Noted: One (1) coat #250 Bondaplex acrylic primer and two (2) coats of #3550 tinted block filler roller applied, 10 mils, <u>and</u> one coat of a stock color of paint as selected of type compatible to receive two coats of clear semi-gloss polyester epoxy paint.
- F. Gypsum Wall Board: Unless otherwise indicated, use one (1) coat #690 premium vinyl emulsion **and** two (2) coats AWB1 enamel #8600.
- G. Special Painting: INTERIOR AND EXTERIOR Reference is made to the drawings for the painting of stripes, lettering, symbols, etc. This shall be a part of this section and shall be done by a professional sign painter. Graphics shall have 1/2" black borders.
- H. Miscellaneous Paintable Items: Miscellaneous paintable items not covered above shall receive two coats of paint of proper type formulated for use on said item. All paint must be washable.
- Fire Walls Stencil: Fire walls stencil painting to designate fire wall locations and rating shall be painted in red, directly above the ceiling on all fire walls at 15'-0" o.c. Connect each stencil marking with a continuous red line. Designate fire rating of wall. Refer to Section 04200, Paragraph 2-09 of these specifications.
- J. Utility Piping: All exposed utility piping in kitchen and utility areas shall receive one (1) coat primer and two (2) coats high gloss enamel as necessary to assist maintenance with location. Verify with Architect prior to painting. Use the following colors:
 - a. Gas Yellow
 - b. Cold water Blue
 - c. Hot water Red

NOTE: Piping that is insulated, yet exposed **<u>shall not</u>** be painted.

3-04 EXTERIOR PAINTING:

- A. Ferrous Metal Surfaces: Two (2) coats of exterior metal finishing paint over shop coat.
- B. Galvanized Metal: Treat as required with xin primer and apply two (2) coats of exterior metal finishing paint.
- C. Woodwork and Trim: One (1) coat of primer and two (2) coats of exterior oil base paint.
- D. Exposed block painted two (2) coats of exterior masonry paint where exposed.
- **3-05 SPECIAL NOTE:** All exterior exposed metal and interior exposed framing, structural angles, channels and miscellaneous structural members shall be primed and painted with two (2) coats of appropriate paint.

End of Section

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DIVISION NO. 10 – SPECIALTIES

SECTION 10 43 60 – EXTERIOR POST AND PANEL SIGNS

PART 1 - GENERAL

1.1 <u>RELATED DOCUMENTS</u>

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

1.2 <u>SUMMARY</u>

- A. This Section includes the following:
 - 1. Nonilluminated multipanel changeable message-bar-type post and panel exterior signs.
- B. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Concrete fill in post holes is included in Division 3 Section "Concrete Work."

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Design Criteria: Design, fabricate, and install exterior post and panel-type signs to withstand a wind pressure of 100 mph on the total sign area in all directions.

1.4 <u>SUBMITTALS</u>

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: Include manufacturer's construction details relative to materials, dimensions of individual components, profiles, and finishes for each type of sign required. Provide manufacturer's recommendations for maintenance and cleaning requirements for exterior sign surfaces.
- C. Shop Drawings: Include plans, elevations, and not less than 3/4-inch scale sections of typical members and other components. Show anchors, reinforcement, accessories, layout, and installation details.
 - 1. Indicate required location of connections to electrical service provided as a unit of work under other sections.
 - 2. Provide setting drawings, templates & Directions for installation of anchor bolts & other anchors to be installed as a unit of Work in other

Sections.

- D. Samples: For each sign component provide the following samples showing finishes, colors, and surface texture.
 - 1. For initial selection of color, pattern, and texture:
 - a. Fiber-Reinforced Polyester (Fiberglass): Manufacturer's color charts showing the full range of colors available.
 - 2. For verification of color, pattern, and texture selected, and compliance with requirements indicated:
 - Acrylic, Polycarbonate, and Fiber-Reinforced Polyester Sheet: Provide a sample panel not less than 8-1/2 inches by 11 inches. Include a panel for each color required.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who is an authorized representative of the sign manufacturer and has completed installation of exterior post and panel signs similar in material, design, and extent to those indicated for the Project and that has resulted in construction with a record of successful in-service performance.
- B. Single-Source Responsibility: Obtain exterior post and panel signs from one source from a single manufacturer.
- C. Design Concept: The drawings indicate the size, profiles, and dimensional requirements of post and panel signs and are based on the specific type and model indicated. Signs by other manufacturers may be considered provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.

1.6 DELIVERY AND HANDLING

- A. Delivery: Proved protective covering or crating as recommended by the manufacturer to protect sign components and surfaces against damage during transportation and delivery.
 - 1. Coordinate time of delivery so that pylon signs can be installed within 24 hours of receipt at the project site.
- B. Handle signs carefully to prevent breakage, surface abrasion, denting, soiling, and other defects. Comply with the manufacturer's handling instructions for unloading components subject to damage.
 - 1. Inspect sign components for damage upon delivery. Do not install damaged sign components. Repair minor damage to signs, provided the finished repair is equal in all respects to the original work and is acceptable to the Architect; otherwise remove and replace damaged sign components.

1.7 <u>WARRANTY</u>

- A. Fiberglass Sign Panel Warranty: Submit a written warranty signed by the manufacturer agreeing to repair or replace fiberglass panels that fail due to coating degradation, chalking, fading, or fiberglass delamination or cracking.
 - 1. Warranty Period: 20 year Manufacturer Limited Warranty.
 - 2. The warranty submitted under this Section shall not deprive the Owner of other rights or remedies that the Owner may have under other provisions of the Contract Documents and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 <u>MANUFACTURERS</u>

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:
 - Polly Products 12 Charlotte Street, Mulliken, MI 48861, (P) 877.609.2243
- 2.2 MATERIALS Unit MMC–1S2P6 Recycled Plastic
- A. Frame: Unit and posts made of recycled plastic
- B. Poly-carbonate Window: Window to be break and shatter-resistant. Provide ultraviolet-light-resistant, surface-treated polycarbonate sheets in sizes and thicknesses indicated with a minimum flexural strength of 13,500 psi when tested in accordance with ASTM D 790 at 240 deg F (116 deg C) allowable continuous service temperature, and Izod impact strength of 16 ft-lb per inch when tested in accordance with ASTM D 256.
- C. Tack Board: Recycled Rubber
- D. Concrete: Provide concrete for post holes consisting of Portland cement complying with ASTM C 150, aggregates complying with ASTM C 33, and clean water. Mix the materials to obtain concrete with a minimum 28-day compressive strength of 2500 psi. Use at least 4 sacks of cement per cubic yard, 1-inch maximum size aggregate, maximum 3" slump, and 2 to 4 percent entrained air.
- E. Fasteners: Unless otherwise indicated, use stainless steel concealed fasteners fabricated noncorrosive to either the sign material or the mounting surface.
- F. Hinges: Use tamper proof stainless steel.
 - 1. Lock: Use weather resistant lock.

2.3 <u>COMPONENTS</u>

- A. Posts: Provide the manufacturer's standard recycled plastic posts designed to engage sign panels. Include post caps, fillers, spacers, and related accessory items required for a complete installation. Comply with the following requirements for post shape, finish, and mounting method:
 - 1. Post Shape: 4-inch by 4-inch square.
 - 2. Post Mounting Method: Provide sign posts of length required for permanent installation by the direct-burial mounting method.
- B. Panels: Provide smooth, even, level sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner.
 - a. Frames: Fabricate frames to profile indicated with integral slots to receive sign message panel; comply with the following requirements:
 - 1) Frame Material: Recycled Rubber.

2.4 FABRICATION

- A. General: Provide the manufacturer's standard double post and panel signs. The completed sign assembly shall consist of a message panel supported between two posts. Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
 - Allow for thermal movement resulting from a maximum ambient temperature change (range) of 100 deg F (55.5 deg C). Design, fabricate, and install post and panel sign assemblies to prevent buckling, opening up of joints, and overstressing welds and fasteners.
 - 2. Mill joints to a tight, hairline fit. Form joints exposed to the weather to exclude water penetration.
 - 3. Preassemble post and panel signs in the shop to the greatest extent possible to minimize field assembly. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in a location not exposed to view after final assembly.
 - 4. Conceal fasteners where possible; otherwise locate fasteners where they will be inconspicuous.
- B. Posts: Fabricate posts to lengths required for mounting method indicated.
 - 1. Direct Burial: For permanent sign installation, provide posts 36 inches longer than height of sign indicated to permit direct embedment in concrete foundations.
- C. Panels: Form panels to required size and shape. Comply with requirements indicated for design, dimensions, finish, color, and details of construction.
 - 1. Coordinate dimensions and attachment methods to produce message panels with closely fitting joints. Align edges and surfaces with one another in the relationship indicated.
 - 2. Increase metal thickness or reinforce with concealed stiffeners or backing

materials as required to produce surfaces without distortion, buckles, warp, or other surface deformations.

2.5 <u>FINISHES</u>

A. Colors and Textures: For exposed sign material that requires selection of materials with integral or applied colors, textures, or other characteristics related to appearance, provide color matches as selected by the Architect from the manufacturer's standards.

PART 3 - EXECUTION

3.1 **PREPARATION**

A. Furnish templates, anchor bolts, internal reinforcing, and other items required to be set in concrete post foundations at proper time for setting.

3.2 INSTALLATION

- A. General: Locate sign units and accessories where indicated, using mounting methods of the type described and in compliance with the manufacturer's instructions.
- B. Excavation: In firm undisturbed or compacted soil, drill or (using a post-hole digger) hand-excavate holes for each post to the minimum diameter recommended by the sign manufacturer, but not less than 4 times the largest post cross-section.
- C. Setting Posts: Center and align posts in holes 3 inches above bottom of the excavation.
 - 1. Protect portion of posts above ground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold in position until concrete has achieved its initial set.
- D. Install signs level, plumb, and at the height indicated, with sign surfaces free from distortion or other defects in appearance.

3.3 <u>CLEANING</u>

A. At completion of the installation, clean soiled surfaces of sign units in accordance with the manufacturer's instructions.

3.4 **PROTECTION**

A. Protect installed sign units from damage until acceptance by the Owner. END OF SECTION 10 43 60 THIS PAGE LEFT INTENTIONALLY BLANK

SECTION 10 44 00 - FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provision of Contract, including General and Special Conditions and Division 1 Specification Section, apply to work of this Section.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Portable fire extinguishers
 - 2. Cabinets for portable fire extinguishers

1.03 DEFINITIONS

- A. COTR: Contracting Officer Technical Representative
- B. FM: FM Global (Factory Mutual)
- C. FPE: Fire Protection Engineer
- D. Furnish: To supply the stated equipment or materials
- E. Install: To set in position and connect or adjust for use
- F. NFPA: National Fire Protection Association
- G. NICET: National Institute for Certification in Engineering Technologies
- H. OSHEM: Office of Safety Health and Environmental Management
- I. Provide: To furnish and install the stated equipment or materials
- J. UL: Underwriters Laboratories

1.04 SYSTEM DESCRIPTION

A. Portable fire extinguishers and cabinets for occupant use.
1.05 PERFORMANCE REQUIREMENTS

- A. In accordance with NFPA 10.
- B. Extinguishers installed throughout most occupancies shall have a minimum rating of 2A:10B:C
- C. Provide type K fire extinguishers in all commercial kitchens.
- D. Provide clean agent, water mist, or CO2 portable fire extinguishers and one water extinguisher for class A fires in all IT specs. Dry chemical extinguishers shall not be permitted.
- E. Exhibit display areas and ordinary collection storage spaces shall be provided with water mist type portable extinguishers. Dry chemical extinguishers shall not be permitted in these spaces.
- F. Wet collection storage areas shall be provided with CO₂ portable fire extinguishers.
- G. Provide fire extinguishers throughout all buildings and spaced in accordance with NFPA 10.

1.06 SUBMITTALS

- A. A. Submit manufacturers brochure and product data for each type of fire extinguisher, complete with manufacturers' warranty and inspection tag.
- B. Submit data to illustrate cabinets and installation/mounting methods.

1.07 QUALITY ASSURANCE

- A. American Disability Act (ADA)
 - 1. ADA Accessibility Guidelines (ADAAG)
- B. American Society for Testing and Materials (ASTM)
 - 1. A1008/A1008M Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
 - 2. ASTM A167-Stainless and heat resisting chromium-nickel steel plate, sheet and strip
 - 3. ASTM A336-Cold rolled carbon steel sheets, commercial quality
 - 4. C1036 Standard Specification for Flat Glass
 - 5. E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops

- C. National Fire Protection Association (NFPA)
 - 1. NFPA 10 Portable Fire Extinguishers
- D. Fire Extinguishers: Listed and labeled by Underwriter's Laboratory (UL) or Factory Mutual (FM) for type, rating, and classification
 - 1. UL 8 Standard for water based agent fire extinguishers
 - 2. UL 154 Standard for carbon dioxide fire extinguishers
 - 3. UL 299 Standard for dry chemical fire extinguishers
 - 4. UL 626 Standard for water fire extinguishers
 - 5. UL 2129 Standard for halocarbon clean agent fire extinguishers.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver fire extinguishers or cabinets to site until rooms in which they are to be installed are ready to receive them.
- B. Protect cabinets to avoid damage to finish.

1.09 PROJECT CONDITIONS

A. List any special project conditions and/or environmental limitations on system installation, such as temperature, humidity, ventilation, etc.

1.10 COORDINATION

A. Coordinate installation with finished wall surfaces.

1.11 WARRANTY

A. Provide a warranty by the manufacturer against defects in manufacturing and materials.

1.12 OWNER'S REPRESENTATIVE AGENCY

A. Verify with owner the representative agency that maintains the current fire extinguishers. Provide new extinguishers of the type and manufacturer that can be maintained by the owner's current representative agency.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. 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. Ansul Inc.

- 2. J L Industries
- 3. Larsen's Manufacturing Co.
- 4. Encon Safety Products

2.02 MATERIALS

A. Cold-Rolled Steel Sheet: Carbon steel, complying with ASTM A1008/A1008M, commercial quality, stretcher leveled, temper rolled.

2.03 PORTABLE FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers of type, size, and capacity for each cabinet and other locations indicated. See section 1.07 for requirements for specific spaces.
 - 1. Product: A 10-lb, multi-purpose, UL listed, dry chemical fire extinguisher with rating based on spacing and hazard.
 - 2. Product: UL listed, water fire extinguisher with rating based on spacing and hazard.
 - a. recessed type cabinets
 - b. semi-recessed cabinets
 - c. surface bubble type cabinets
- B. Mounting Brackets: Manufacturer's standard steel bracket, designed to secure extinguisher, of sizes required for types and capacities of fire extinguisher indicated, with plated or baked-enamel finish.

2.04 FIRE EXTINGUISHER CABINETS

- A. General: Unless specified otherwise on construction drawings, provide fire extinguisher cabinet of type, size, and rating as indicated below, or equivalent.
- B. Cabinet Size: The minimum inside box dimensions shall be 24"H x 9½W x 6"D for SNL Type I and Type III fire extinguishers and 27"H x 12"W x 8"D for SNL Type II fire extinguishers.
- C. Cabinet Construction: Provide manufacturer's standard box, with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Weld joints and grind smooth. Miter and weld perimeter door frames.
- D. Fire-Rated Cabinets: Listed and labeled to meet requirements of ASTM E814 for fire-resistance rating of wall where it is installed. Construct fire-rated cabinets with double walls fabricated from 0.0478-inch (1.2-mm) thick, cold-rolled steel sheet lined with minimum 5/8-inch (16-mm) thick, fire-barrier material. Provide factory drilled mounting holes.
 - 1. Cabinet Metal: Enameled-steel sheet.
 - 2. Shelf: Same metal and finish as cabinet.

- E. Cabinet Mounting: Suitable for the following:
 - Recessed: For 12" or greater walls: Cabinet box recessed in walls of sufficient depth to suit style of trim indicated. Aluminum Cabinets shall be J.L. Industries Panorama 1015Q48 non-rated recessed cabinet with Contemporary Solid AV@ Door or Approved Equal.
 - Semi-recessed: For 8" or less walls: Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated. Aluminum Cabinets shall be J.L. Industries Panorama 1015Q48 non-rated, semi-recessed cabinet with Contemporary Solid AV@ Door or Approved Equal.
 - 3. Surface Mounted: Cabinet box fully exposed and mounted directly on wall.
 - 4. For rated walls up to 2 hour rated: Provide J.L. Industries FX. This is an option for both one and two-hour rated walls.
 - 5. Cabinets shall be aluminum with mill finish.
- F. Cabinet Trim Style: Fabricate cabinet trim in one piece with corners mitered, welded and ground smooth.
- G. Cabinet Trim Material: Steel sheet.
- H. Door Material: Steel sheet.
- I. Door Glazing: Clear Float Glass, ASTM C1036, Type 1, Class 1
- J. Door Style: Vertical duo panel with frame.
- K. Door Construction: Provide a minimum ¹/₂-inch (13 mm) thick door frames.
- L. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide recessed door pull and friction latch. Provide continuous-type hinge permitting door to open 180 degrees.
- M. Cabinet and Door Finishes: Provide manufacturer's standard baked-enamel paint for the exterior and interior of the cabinet and doors.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where recessed and semi-recessed cabinets are to be installed. Verify that rough openings for cabinets are correctly sized and located.
- B. Examine fire extinguishers for proper charging and tagging. Remove and replace damaged, defective, or undercharged units.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION OF FIRE EXTINGUISHERS

- A. Comply with manufacturer's written instructions for installing fire extinguishers and mounting brackets.
- B. Mounting Height: Install extinguishers at heights indicated below.
 - 1. Install fire extinguishers mounted on hangers or brackets attached to a wall so that the top of the fire extinguisher is not more than $3\frac{1}{2}$ ft. above the floor or as per code.
 - 2. In no case shall the clearance between the bottom of the fire extinguisher and the floor be less than 4 inches.
- C. Locations: Install extinguishers at locations indicated below.
 - 1. Install fire extinguishers at locations specified on the drawings or as directed by the authority having jurisdiction.
 - 2. Fire extinguishers shall be conspicuously located, along normal paths of travel, including exits from areas. Extinguishers shall not be obstructed or obscured from view.
- D. Install portable fire extinguishers on the hanger or in the bracket supplied, or place in the fire extinguisher cabinets provided. Verify that the extinguisher operating instructions face outward.

3.03 INSTALLATION OF FIRE EXTINGUISHER CABINETS

- A. Comply with manufacturer's written instructions for installing fire extinguisher cabinets.
- B. Mounting Height: Install fire extinguisher cabinets at the height required so that the top of the fire extinguisher is not more than 54 inches above the floor for chemical Type. Not more than 36 inches above the floor for water Type. And, in no case, may the bottom be less than 4 inches above the finished floor.
- C. Install fire extinguisher cabinets at locations specified on the drawings.
- D. Fire extinguisher cabinets shall protrude no more than 4 inches into corridors, passageways, or aisles.
- E. Repair/paint wall surfaces surrounding fire extinguisher cabinet damaged during installation to match existing wall surface.

3.04 SIGNAGE

- A. Identify bracket-mounted extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to wall surface.
- B. Identify fire extinguisher in cabinet with the words "FIRE EXTINGUISHER" applied to door.
 - 1. Application Process: Decals
 - 2. Lettering Color: Red
 - 3. Orientation: Vertical
- C. Where space layout limits ability to see fire extinguisher location, provide a wall sign that is nominally perpendicular to the wall. Sign shall have a fire extinguisher symbol on it.

3.05 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust cabinet doors that do not swing or operate freely.
- B. Refinish or replace cabinets and doors damaged during installation.
- C. Provide protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Construction Completion.

SPECIAL NOTE:

General Contractor to furnish fire extinguisher at all new cabinet locations. Contractor shall provide fire extinguishers at all Electrical and Hot Water Heater Rooms with hangers.

END OF SECTION

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SECTION 12 93 00 – SITE FURNISHINGS OUTDOOR BENCHES and TRASH RECEPTACLES

PART 1 - GENERAL

1.1 <u>RELATED DOCUMENTS</u>

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

1.2 <u>SUMMARY</u>

- A. This section includes the following:
 - 1. Ash/trash receptacles
 - 2. Benches

1.3 <u>SUBMITTALS</u>

- A. Product data for each type of accessory specified, with installation instructions for each unit built-in or connected to other construction. Include methods of installation for each type of substrate.
- B. Shop drawings showing installation details of accessories permanently affixed to construction, including full scale installation details of special conditions.
- C. Samples for initial selection purposes consisting of manufacturer's standard size samples showing full range of colors, textures, and patterns available for each type of accessory required.

1.4 **QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Firm (material producer) with not less than 3 years of production experience, whose published literature clearly indicates general compliance of products with requirements of this section.
- B. Single Source Responsibility: Provide material produced by a single manufacturer for each accessory type.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in original factory wrappings and containers, clearly labeled with identification of manufacturer, brand name, and lot number. Store materials in original undamaged packages and containers, inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity; laid flat, blocked off ground to prevent sagging and warping.

B. Comply with instructions and recommendations of manufacturer for special delivery, storage, and handling requirements.

1.6 SEQUENCE AND SCHEDULING

A. Sequence accessory installation with other work to minimize possibility of damage and soiling during remainder of construction period.

1.7 <u>MAINTENANCE</u>

A. Maintenance Instructions: Submit manufacturer's printed instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use conditions. Include precautions against materials and method which may be detrimental to finishes and performance.

PART 2 - PRODUCTS

2.1 <u>MANUFACTURERS</u>

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

Benches

- 1. Cabin Seating Columbia Cascade Company, 1300 SW Sixth Ave., Suite 310, Portland, OR 97201-3464, or approved equal.
- 2. Cemetery Seating Barlow Tyrie, Inc., 1263 Glen Ave., Suite 230, Moorestown, NJ 08057-1139, Anderson Teak, or approved equal.

Waste Receptacles

- 1. Cabin Seating Columbia Cascade Company, 1300 SW Sixth Ave., Suite 310, Portland, OR 97201-3464, or approved equal.
- 2. Cemetery Seating Barlow Tyrie, Inc., 1263 Glen Ave., Suite 230, Moorestown, NJ 08057-1139, Anderson Teak, or approved equal.

2.2 <u>MATERIALS</u>

- A. Wood: Timber shall be free-of heart-center (F.O.H.C.)coastal Douglas fir, finegrained. There shall be no knots, knotholes, shake, unsound wood, whitespeck or honeycomb allowed.
- B. Sheet Steel: Cold rolled, commercial quality, ASTM A 366, minimum 20 gauge unless otherwise indicated. Surface preparation and metal pretreatment as required for applied finish.
- C. Painted Finish: Baked acrylic enamel coating.
- D. Fiberglass: Contact molded, fire-retardancy complying with ASTM D 635.

E. Fasteners: Screws, bolts or other exposed devices of same material as accessory unit, or of galvanized steel where concealed. Equip items with theft-proof fasteners where accessible to tampering.

2.3 FABRICATION, GENERAL

A. Provide accessory items, both free standing and permanently installed, equipped with functions as specified. Fabricate units with tight seams and joints, exposed metal edges rolled. Manufacturer or product identification on exposed surfaces is unacceptable. Provide products with smooth welds, consistent finish with no evidence of wrinkling, chipping, uneven coloration, dents, or other imperfections.

2.4 <u>ASH/TRASH RECEPTACLES</u>

- A. Cylindrical Ash/Trash Receptacle: Cylindrical, free standing steel bodied ash/trash receptacle with removable stand urn top, circular trash receptor hole and removable internal liner. Equip unit with removable ash top. Provide units with absolute segregation of ash and trash compartments, Class A rated materials, and stabilization of unit to prevent tipping.
 - 1. Ash Receptacle: Sand-holder, equipped with white sand.

2.5 WASTE RECEPTACLES

A. Cylindrical Waste Receptacle: Cylindrical free standing 20 gallon capacity fiberglass unit, minimum 20 inches in diameter, 32 inches high. Provide unit designed of Class A rated materials, with removable top and 8-inch waste receptor hole. Equip unit with removable internal liner. Stabilize unit to prevent tipping.

2.6 <u>FINISHES</u>

A. Provide materials in colors and finishes as selected by Architect from manufacturer's standard colors and finishes.

2.7 PRODUCTS

- A. Cabin Seating Benches:
 - 1. Seat shall be TimberForm *Colossus* series model No. 2218-16, twelve feet long, 4 units for a total of 36 linear feet as manufactured by the Columbia Cascade Company, (or approved equal).
 - 2. Timbers shall be nominal 8 inch x 12 inch. To eliminate slivering, timbers shall be free of wane, and planer skips are not allowed in dressing. Except as noted, other characteristics and limiting provisions are in accordance with Paragraph 131-A <u>Standard Grading Rules for West Coast Lumber</u>.
 - 3. Seat shall ship unassembled and include installation hardware for assembly by contractor. Each support leg shall be assembled and welded into a single unit. Welds shall be smooth and continuous with no gaps or

pin holes. Final product shall be free of weld spatters and burrs. Seats shall attach to frame with 5/8 inch x 8 inch hot-dipped galvanized lag screws.

- 4. Timber shall be preservatively treated with a non-toxic formulation capable of deep penetration without materially changing the color of the wood to which it is applied.
- B. Cemetery Benches:

C.

- 1. Seat shall be Glenham series, 5 feet long, 2 units for a total of 10 linear feet as manufactured by Barlow Tyrie (or approved equal).
- 2. Finish shall be natural teak.
- Trash Receptacles:
 - 1. Trash receptacle shall be Item No. 2814-DT Dome Top Litter Container with key-locking top as manufactured by the Columbia Cascade Company, (or approved equal)
 - 2. Include 32-gallon plastic liner.
 - 3. Mounting to be embedment mounting in concrete.
 - 4. Finish to be powder-coated steel. Color to be as selected by architect from manufacturer's ten (10) standard colors.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify that materials are those specified before installing.
- B. Install accessories after other finishing operations, including painting, have been completed.
- C. Free Standing Accessory Units: Install free standing units in scheduled locations.
- D. Adjust accessory items for proper operation. Clean and polish exposed surfaces, using materials and methods recommended by the manufacturer.

3.2 **PROTECTION**

A. Protect accessories against damage during remainder of construction period, complying with manufacturer's directions.

END OF SECTION 12 93 00

GENERAL SITE WORK

SECTION 31 10 00

31 10 00.1 General

1.1 Site work shall be confined to the construction area as shown on the plans and shall be done in an approved manner with proper equipment. Excavation, filling, and grading work shall be suspended during rain and inclement weather or when unsatisfactory field conditions are encountered unless otherwise directed by the Engineer. At all times during construction, Contractor shall maintain proper drainage in the construction area.

31 10 00.2 Clearing and Grubbing

2.1 Where trees or brush exist at the site of the work, the construction area shall be cleared and stumps grubbed. Only those trees that seriously interfere with construction shall be cut and care shall be exercised to protect remaining trees and adjacent property. Brush shall be removed from the entire construction area and all stumps, logs, and brush resulting from this operation shall be completely burned or otherwise disposed of to the Engineer's satisfaction. Minor structures that may be on the site shall be removed and disposed of to the satisfaction of the Engineer.

(1) The operations of the Contractor shall be conducted with full consideration to all the proper and legal rights of the Owner and of adjacent property owners and the public and with the least possible amount of inconvenience to them.

(2) The Contractor shall consult with the Owner and Engineer prior to beginning clearing and a full understanding is to be reached as to procedure. The Contractor shall then conduct clearing and grubbing operations in strict accordance with these agreements.

2.2 Reasonable care shall be taken during construction to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees, which receive damage to branches, shall be trimmed of those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a "tree dressing."

31 10 00.3 Excavations and Grading

3.1 Dewatering equipment, when necessary, shall be installed prior to beginning excavation. The Contractor shall install a dewatering system capable of maintaining the ground water level of the entire area of construction two (2) feet below the deepest level of the proposed excavation. The dewatering system shall be maintained continuously 24 hours per day, seven

days a week, for the entire period of construction and until backfilling is complete. Upon completion of backfilling, the ground water shall be allowed to slowly adjust to the normal level.

Should the dewatering system fail to maintain the water level as specified above, the Contractor shall employ a soil and foundation testing company selected by the Engineer to make the necessary investigation to determine the effect of the water or the safe bearing value of the soil and, if damaged, to recommend the necessary construction to restore the safe soil bearing value. The cost of employing the testing company and performing the construction recommended by them shall be borne by the Contractor.

The Contractor shall submit to the Engineer for approval, the method of dewatering along with a list of equipment and experience of the personnel performing this work.

End of Section

EROSION CONTROL

SECTION 31 25 00

Page | 1 31 25 00.1 General

.1.1 Erosion control shall be performed as given on the Erosion Control Plan. Indicated features are to be provided in accordance with standards given below. Special features or construction will be detailed on the Plan Sheet. The Engineer before project construction shall approve all deviations from the Erosion Control Plan.

31 25 00.2 Temporary Construction Entrance

.2.1 Definition - A stone stabilized pad located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk, or parking area.

.2.2 Design Criteria - Coarse aggregate up to approximately 3 inches in diameter should be used. Pad thickness shall be 6-inches minimum with a pad width of not less than full width at all points of vehicular ingress or egress. Pad length shall be not less than 50 feet. Wheels must be cleaned to remove mud prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with crushed stone, which drains into an approved sediment trap or sediment basin. Entrance shall be located or protected so as to prevent sediment from leaving the site.

.2.3 Maintenance - The entrance shall be maintained in a condition that will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with 2-inch stone, as conditions demand, and repair and/or clean out of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicle onto site, onto roadway, or into storm drain should be removed immediately.

31 25 00.3 Temporary Perimeter Dike

.3.1 Definition - A ridge of compacted soil, with a life expectancy usually of one year or less, constructed along the perimeter of the disturbed area.

.3.2 Standards - Drainage areas of not more than 5 acres. Top width of 2-foot minimum with a height (compacted fill): 18-inch minimum unless otherwise noted on the plans. (Height measured from the natural ground at the upslope toe to top of the dike.) Side slopes 2:1 or flatter. The grade is dependent upon topography, but must have positive drainage to the outlet. Where slope of channel behind dike is less than 2%, stabilization may not be required; where 2% or more, stabilization will be required.

.3.3 Outlet - Diverted runoff must be discharged directly into a sediment trapping facility such as a sediment basin, sediment trap, or gravel outlet structure.

.3.4 Construction Specifications - (a) All dikes must be machine compacted. (b) All perimeter dikes must have positive grade draining to a sediment trapping facility. (c) Frequent inspection and required maintenance must be provided. (d) Dikes must be located far enough away from the disturbed area to permit machine regrading and clean-out. (e) Diversion dikes Page | 2 must be seeded and/or mulched immediately following construction.

31 25 00.4 Temporary Diversion Dike

.4.1 Definition - A ridge of compacted soil with a general life expectancy of one year or less, constructed immediately above cut, or fill slopes, or other site feature needing protection from runoff water.

.4.2 Criteria - A drainage area of no more than 5 acres. A top width of 2-feet minimum with a height (compacted fill): 18-inch minimum (height measured from the natural ground at the up-slope toe to the top of the dike.) The side slopes shall be 2:1 or flatter with a grade dependent upon topography, but must have positive drainage to the outlet. Where slope of channel behind dike is less than 2%, stabilization may not be required; where the slope is 2% or greater, stabilization shall be required.

.4.3 Outlet_- Diverted runoff must outlet directly onto an on-site, undisturbed, stabilized area, a level spreader, or into a grade stabilization structure or sediment basin.

.4.4 Construction Specifications - (a) All dikes must be machine compacted. (b) All diversion dikes must have positive grade to an outlet. (c) Diverted runoff must outlet directly onto an on-site, undisturbed stabilized area, a level spreader, into a grade stabilization structure, or a sediment basin. (d) Frequent inspection and required maintenance must be provided. (e) Dikes must be located far enough away from the construction area to permit machine regrading and clean-out. (f) Diversion dikes must be seeded and/or mulched immediately after construction.

31 25 00.5 Temporary Interceptor Dike

.5.1 Definition - A ridge of compacted soil or gravel, constructed across a disturbed right-of-way and similar sloping areas, usually to remain for a period of less than one year.

.5.2 Criteria - A top width of 2-feet minimum with a height of 18-inches minimum unless otherwise noted on the plans (height measured from the upslope toe to top of the dike.) Side slopes of 2:1 or flatter (flat enough to allow construction traffic to cross if desired) and with a grade of 0.5% to 1.5%. Spacing distance between dikes: maximum slope of right-of-way above dike: 60 feet, 10%; 100 feet, 5-10%; 150 feet, 5%.

.5.3 Outlet - Interceptor dikes must have an outlet that functions with a minimum of erosion. The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet.

.5.4 Construction Specifications - (a) All earthen dikes must be machine compacted. (b) All interceptor dikes must have positive grade to an outlet. (c) Top width may be wider and side slopes may be flatter if desired. (d) Field location should be adjusted as needed to utilize a stabilized safe outlet. (e) Diverted runoff must outlet directly onto an undisturbed stabilized area, a level spreader, or into a grade stabilization structure. (f) Frequent inspection and required Page | 3 maintenance must be provided.

31 25 00.6 Temporary Level Spreader

.6.1 Definition - An outlet constructed at zero grade across the slope whereby concentrated runoff may be discharged at non-erosive velocities onto undisturbed areas stabilized by existing vegetation.

.6.2 Design Criteria - A specific design for level spreaders will not be required; however, spreader length will be determined by estimating Q10 flow and selecting the appropriate length from the table below.

.6.4 Outlet - Final discharge will be over the level lip onto an undisturbed stabilized area.

.6.5 Construction Specifications - (a) Construct level lip on zero percent grade to insure uniform spreading of storm runoff (converting channel flow to sheet flow). (b) Level spreaders must be constructed on undisturbed soil -- NOT ON FILL. (c) Entrance to spreader must be graded in a manner to insure that runoff enters directly into the zero percent graded channel. (d) Storm runoff converted to sheet flow must outlet onto undisturbed stabilized areas. (e) Periodic inspection and maintenance must be provided to insure intended purpose is accomplished. (f) Frequent clean-out of the level spreader, being careful not to disturb the vegetation below the level lip, may be necessary to prevent blockage by silt.

PLAN VIEW				
Designed Q	Minimum Length			
(CFS)	("L" in Ft.)			
Up to 10	15			
10 to 20	20			
20 to 30	26			
30 to 40	36			
40 to 50	44			

31 25 00.7 Temporary Gravel Outlet Structure

.7.1 Definition - An auxiliary structure installed in conjunction with, and as a part of a diversion, interceptor, or perimeter dike, or other structure designed to temporarily detain sediment-laden surface runoff.

.7.2 Design Criteria - The minimum capacity shall be that required to pass the peak flow expected from a ten-year frequency storm without causing damage to the dike. Minimum length in feet, of the gravel outlet structure, shall be equal to six times the number of acres of

contributing drainage area. The invert of the gravel outlet shall not be less than 6 inches lower than the minimum elevation of the top of the dike. Use 1 to 3 inch well-graded gravel.

.7.3 Outlet - Gravel outlet will be discharged onto an already stabilized area or into a stable watercourse.

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.7.4 Maintenance - The gravel outlet structure shall be inspected after each runoff-producing rain. The gravel must be replaced when the structure ceases to function as intended due to silt accumulation among the gravel.

.7.5 Construction Specifications - (a) The bases and side slopes of the gravel will be placed so as to conform to the dike configuration. (b) The invert of the gravel outlet shall be not less than 6 inches lower than the top of the adjoining earth dike. (c) The gravel shall extend to the top of the dike.

31 25 00.8 Temporary Pipe Drop

.8.1 Definition - A temporary pipe installed down a bank slop to convey storm runoff from the top to the bottom of the bank slope.

.8.2 Design Criteria - The minimum design capacity for the temporary pipes shall be the peak runoff from a 5-year, 24-hour frequency storm. Additional capacity shall be provided in the form of freeboard, emergency spillway, or other means to prevent overtopping of the dike protecting the pipe during its expected life. Runoff calculations shall be based on an acceptable and currently used method of computing runoff. The minimum pipe diameter shall be 8 inches.

.8.3 Inlet and Outlet<u>-</u> A standard flared end section or equivalent shall be used on the inlet end to decrease head losses and on the outlet end to spread out the concentrated flow.

.8.4 Maintenance - Frequent inspection will be required to avoid clogging of the inlet from debris or vegetation.

.8.5 Vegetative Stabilization - The disturbed area shall be vegetated in accordance with the standard "Planting for Erosion Control."

.8.6 Construction Specifications - (a) The structure shall be placed in undisturbed soil or well-compacted fill. (b) The cut or fill slope shall not be steeper than 1 vertical to 2.0 horizontal (2.0:1) and should not be flatter than 20:1. (c) The pipe shall be imbedded in the embankment to a depth that will insure stability. (d) Protective measures of concrete or rip-rap shall be installed at the outlet <u>as needed</u> to protect against erosion. (e) The pipe shall be of smooth or corrugated metal of the required strength and durability. (f) Backfill shall be placed in layers and tamped to insure adequate compaction. (g) Fabricated bends in the pipe may be necessary for installation on steep slopes.

31 25 00.9 Temporary Straw (or Hay) Bale Barrier

.9.1 Definition_- A barrier installed to intercept and detain sediment.

.9.2 Criteria - Bales must be securely tied and staked in place.

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.9.3 Construction Specifications - (a) Bales will be placed in a single row, lengthwise, on the contour, and embedded in the soil to a depth of 3 inches. (b) Bales must be securely anchored in place by stakes or rebars driven through the bales or by other acceptable means to prevent displacement. (c) Inspection must be frequent and repair or replacement must be made promptly as needed.

31 25 00.10 Temporary Sediment Trap

.10.1 Definition - An impounding area formed by excavation or barrier to trap sediment being transported by storm runoff from a disturbed area of <u>very limited size</u>.

.10.2 Design Criteria - The trap shall be sized to provide a minimum storage capacity of 67 cubic yards per acre of contributing drainage area. It should be dimensioned to fit the site conditions and located so as to not interfere with construction operations and to facilitate periodic clean out. Traps shall be not less than 1 foot or more than 2 feet deep measured from the invert of the outlet. The minimum length of flow through the trap shall be 10 feet. Side slopes shall not be steeper than 1:1. Sediment traps must be self-draining unless they are otherwise protected in an approved fashion so as not to present a safety hazard.

.10.3 Construction Specifications - (a) Sediment traps may be constructed on a natural ground surface, on an excavated surface, or on machine compacted fill provided they have a non-erodible outlet. (b) They must be checked after each runoff producing rain and repaired or cleaned as necessary to insure that they will operate as intended.

31 25 00.11 Debris (or Sediment) Basin

.11.1 Definition - A barrier or dam constructed across a waterway or at other suitable location to form a silt or sediment basin.

.11.2 Scope - This section covers the installation of debris basins in sites where: (1) Failure to the structure would not result in loss of life, damage to buildings, highways, railroads, or interruption of use or service of public utilities; (2) Height of embankment does not exceed 20 feet; (3) The drainage area does not exceed 200 acres.

.11.3 Design Criteria - Compliance with Laws and Regulations: Design and construction shall comply with all state and local laws, ordinances, rules and regulations.

.11.4 Sediment Storage Capacity - The sediment storage capacity of a debris basin shall equal or exceed the volume of sediment to be trapped in the basin during its planned, useful

life. The <u>minimum</u> capacity provided should be: Developed areas or well-vegetated areas -- .01- acre foot, per acre, per year. In Construction areas or critically eroding areas -- .06-acre foot per year.

If temporary vegetation is to be established immediately after rough grading, the minimum required storage from construction areas might be reduced by 25 percent.

The storage basin shall be cleaned out whenever its functioning is impaired due to insufficient capacity. Debris basins planned to be converted to ponds after the area above is stabilized must be designed for at least a 6-foot depth of water at the dam in addition to the minimum required sediment storage. Also, a drain must be provided whereby the basin can be drained and the collected sediment removed or spread out if necessary to make an acceptable pond.

.11.5 Principal Spillways - A pipe spillway is required on all basins. The pipe spillway shall consist of a vertical pipe riser or box riser joined to a conduit that will extend through the embankment and outlet below the downstream toe of the fill.

The pipe spillway shall be proportioned to convey not less than 0.2 CFS per acre of drainage area without causing flow through the emergency spillway. The minimum size pipe shall be 4 inches in diameter. The vertical pipe riser or box riser shall have a cross-sectional area at least 1.5 times that of the pipe.

One anti-seep collar shall be installed around the pipe when any of the following conditions exist: (1) The settled height of the dam exceeds 15 feet. (2) The conduit is of smooth pipe larger than 8 inches in diameter. (3) The conduit is of corrugated metal pipe larger than 12 inches in diameter.

The anti-seep collars and their connection to the pipe shall be water-tight. Protection against scour at the discharge end of the spillway shall be provided.

Trash racks shall be installed where needed.

.11.6 Earth Emergency Spillways - All debris basins shall have an earth emergency spillway unless the peak flow from the design storm is carried through a pipe spillway or other mechanical spillway. The earth spillway shall be excavated in undisturbed earth or compacted fill. The minimum bottom width shall be 8 feet. The spillway shall be designed to be stable for the design flow.

Peak discharges for design of the emergency spillway shall be computed using an accepted method and shall be based on the soil and anticipated cover conditions in the drainage area during the expected life of the structure.

The crest of the emergency spillway shall be at least 0.5 feet above the crest of the principal spillway.

For debris basins with 20 acres or less watershed, the combined capacities of pipe and emergency spillways shall be sufficient to convey the peak discharge from the 10-year, 24-hour frequency storm. For debris basins with watersheds greater than 20 acres, the combined capacity of pipe and emergency spillway shall be adequate to convey the peak discharge from the 25-year, 24-hour storm.

The top of a dam for all debris basins shall be at least 0.5 feet higher than the stage reached by the design storm.

The crest elevation of the emergency spillway will be determined by the head required on the principal spillway but shall be at least 0.5 feet above the crest of the principal spillway.

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.11.7 Embankment (Earth Fill) - The minimum top width shall be 10 feet. Side slopes shall be at least 2-1/2:1.

Page | 7 .11.8 Construction Specifications - Site Preparation-- Areas under the embankment and any structural works shall be cleared and grubbed; all vegetation and objectionable material shall be removed.

.11.9 Clearing - All debris basins designed for permanent water shall be cleared. All sediment basins designed for periodic clean-out will be cleared of stumps.

.11.10 Compaction of Embankment - The material placed in the fill shall be free of all sod, roots, frozen soil, stones over six (6) inches in diameter and other objectionable material. The placing and spreading of fill material shall be started at the lowest point of the foundation and the fill shall be brought up in approximately horizontal layers of such thickness that the required compaction can be obtained with the equipment used. The construction equipment shall be operated over the area of each layer in such a way that will result in the required compaction. Special equipment shall be used when the required compaction cannot be obtained without it.

The distribution and gradation of materials throughout the fill shall be such that there will be no lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. Where it is necessary to use materials of varying texture and gradation, the more impervious material shall be placed in the upstream and center portions of the fill.

The moisture content of the fill material shall be such that the required degree of compaction can be obtained with the equipment used.

.11.11 Cut-off Trench - A cut-off trench shall be excavated along the dam centerline on earth fill embankments. The minimum depth shall be 2 feet. The cut-off trench shall extend up both abutments to the riser crest elevation. The minimum bottom width shall be 4 feet but wide enough to permit operation of compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for embankment. The trench shall be drained during the backfilling compaction operations.

.11.12 Emergency Spillways - Earth spillways shall be constructed in undisturbed earth unless otherwise specified and approved.

.11.13 Vegetation Protection - The exposed earthen areas resulting from construction or otherwise existing will be stabilized by seeding, sodding, fertilizing and/or mulching as soon after construction as practical and shall conform to the standard "Planting for Erosion Control."

The embankment and spillway shall be fenced where necessary to protect the vegetation.

.11.14 Final Disposal - After temporary structures have served their intended purpose and the drainage area above is properly stabilized, the embankment and resulting silt deposits are to be otherwise disposed of in accordance with an agreed to plan. Denuded areas will be revegetated.

31 25 00.12 Land Grading

.12.1 Definition - Reshaping the ground surface to planned grades as determined by engineering survey and layout.

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.12.2 Design Criteria - The grading plan and installation shall be based upon adequate surveys and investigations. The plan must show the location, slopes, cuts, fills, and finished elevations of the surface to be graded. The plan shall include all practices necessary for controlling erosion on the site and decreasing siltation downstream. Such practices may include, but are not limited to debris basins, diversion, mulching, temporary or permanent vegetation, retention walls, lined ditches, vegetated waterways, grade stabilization structures, and surface and subsurface drains. The practices may be temporary or permanent depending upon their need after construction is completed. The grading plan shall include the following as a minimum:

(1) The finished cut and fill slopes that are to be vegetated with grasses and legumes shall not be steeper than 2 horizontal to 1 vertical. Slopes to be maintained by tractor or other equipment should not be steeper than 3 horizontal to 1 vertical. The finished grade of cut and fill slopes that are to be vegetated with vines shall not be steeper than 1 horizontal to 1 vertical.

(2) Cut or fills shall not be so close to property lines as to endanger adjoining property without adequately protecting such properties against erosion, sedimentation, slippage, settlement, subsidence, or other related damages.

(3) Structural and/or vegetative practices shall safely conduct surface water to storm drains or adequate watercourses.

(4) Subsurface drainage shall be provided in areas having a high water table to intercept seepage that would affect slope stability, bearing strength, or create undesirable wetness.

(5) No fill is to be placed where it will slide or wash up on the premises of others.

(6) Fill will not be placed adjacent to a channel bank where it will create bank failure and reduce the capacity of the stream, or result in deposition of sediment downstream.

(7) All borrow and disposal areas shall be included as part of the grading plan.

(8) Adequate channels and floodways shall be provided to safely convey the increased runoff from the developed area to an adequate outlet without causing significant channel aggradation, degradation, or increased off site flooding or erosion.

31 25 00.13 Diversion

.13.1 Definition - An earthen channel, with a supporting ridge on the lower side, constructed across the slope.

.13.2 Classification of Diversions

Temporary - Temporary diversions are usually installed to protect some phase of construction or the establishment of vegetation. They normally can be removed after the construction they are protecting is complete or after vegetation on the protected area is established (usually two years or less).

Permanent - Permanent diversions are installed as an integral part of an overall water disposal system. They are designed and maintained as an important part of the system.

.13.3 Design Criteria (Location) - The general location of the diversion will be determined by its purpose. Outlet conditions, topography, land use, soil type, and length of slopes must be considered in arriving at the final location.

Page | 9 On construction sites, the diversions should be located to avoid interference with construction equipment, permanent fixtures, and features of the development.

.13.4 Capacity - Peak runoff values used to determine the capacity requirements of diversion shall be computed using and accepted method. The minimum storm frequency values to be used for design of diversions are outlined in the following table:

MINIMUM DESIGN FREQUENCIES FOR DIVERSION		
Typical Area of Protection	Design Storm* Minimum Frequency 24-Hour Duration	
Construction areas and areas to	2 Years	
be vegetated Agricultural land and pollution	10 Years	
abatement systems Low value buildings for storage, livestock, etc. and recreation	10 Years	
areas Homes, schools, industrial building and other high value buildings	s 50 Years	
	MINIMUM DESIGN FREQUENCIES Typical Area of Protection Construction areas and areas to be vegetated Agricultural land and pollution abatement systems Low value buildings for storage, livestock, etc. and recreation areas Homes, schools, industrial buildings and other high value buildings	

*In all cases, the design storm frequency shall be selected to provide protection consistent with hazard or damage that would occur if the diversion should overtop.

Where it is not possible to provide adequate sediment control measures for a temporary diversion, the channel capacity must be increased to provide for the expected sediment accumulation.

.13.5 Velocity - Permissible design velocities depend primarily on soil and vegetation. Consideration must be given to the type and growth characteristics of the planned vegetation. This will determine the degree of retardance to be used in designing for capacity. Stability of the diversion must be determined for the vegetation during its establishment period when its retardance to flow is least effective. Permissible design velocities shall be determined from the table on the following page.

.13.6 Cross-Section - (Permanent Diversion): The channel shall be designed to have stable side slopes. The side slopes for permanent diversion channels should not be steeper than 3:1. The back slopes of the embankment shall not be steeper than 2:1. The constructed ridge

height shall include at least 0.3 feet freeboard and a reasonable settlement factor must be provided. The minimum top width of the diversion ridge after settlement shall not be less than four (4) feet. All disturbed and denuded areas will be vegetated, sodded, mulched, or otherwise protected.

Page | 10.13.7 Cross-Section - (Temporary Diversion): In determining the cross section of
temporary diversions, consideration shall be given to soil type, outlet conditions, and machinery
working over and around the area. Settlement and top width should be the same as permanent
diversions.

.13.8 Protection Against Erosion and Sedimentation and Vegetative Establishment

Temporary Diversion - When the expected use exceeds three (3) months, temporary vegetation shall be established and maintained until the life of the diversion is terminated. Where temporary vegetation is not practical, mechanical protection such as stone centers or mulching shall be provided.

Permanent Diversions - A filter strip of permanent vegetation thirty feet wide, measured from uphill wetted perimeter of the diversion, will be used.

Permanent vegetation will be established and maintained on the ridge and channel of the diversion, and shall conform to the standard for "Planting for Erosion Control."

Eroding and sediment producing areas in the drainage area above the proposed diversion should be stabilized prior to, or concurrent with the construction of the diversion.

.13.9 Outlets - Diversions will be designed to have adequate outlets that will convey runoff without causing erosion of the diversion or to adjacent areas.

The designed elevation of the water surface in the diversion shall not be lower than the design elevation of the water surface in the outlet at their junction when both are operating at design flow.

.13.10 Construction Specifications:

(a) All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the diversion.

(b) The diversion shall be excavated or shaped to line, grade, and cross section as required to meet the criteria specified here, free of irregularities that will impede normal flow.

(c) Fills shall be compacted as needed to prevent unequal settlement that would cause damage in the complete diversion.

(d) All earth removed and not needed in construction shall be spread or disposed of so that it will not interfere with the functioning of the diversion.

31 25 00.14 Grassed Waterway or Outlet

.14.1 Definition - A natural or constructed open channel established to safely convey surface runoff.

.14.2 Design Criteria (Capacity) - The minimum capacity shall be that required to convey the peak runoff from a 10-year, 24-hour frequency storm. Any acceptable method may be used to compute the peak runoff.

Consideration must be given to the type and growth characteristics of the planned vegetation. Adequate capacity must be provided in the waterway to convey the peak flow during the most dense growth of the planned vegetation.

.14.3 Velocity - Design velocities should be based upon the erodibility of the soil,Page | 11duration of flow, and types and quality of vegetation. The table on the following page provides
the maximum permissible velocities for different soils and vegetation. However, design
velocities should NOT exceed 4.0 feet per second unless the vegetation is already established or
will be established by sodding.

.14.4 Outlets - Outlets of grassed waterways must have adequate capacity to convey the designed quantity of water from the waterway without causing damage to downstream areas. The following types of outlets are acceptable:

(1) Natural or constructed vegetated outlets capable of withstanding the design discharge.

(2) Paved or concrete lined channels.

(3) Streams, provided outfall structures are installed where needed to prevent erosion.

.14.5 Depth - The minimum depth of a waterway or outlet receiving water from diversions or other tributary channels shall be that depth required to keep the design water surface elevation in the waterway or outlet at or below the design water surface elevation in the diversion or other tributary channels at their junction when both are flowing at design capacity.

.14.6 Drainage - Drain pipes or other suitable drainage measures shall be provided for in the design for sites having low flow, high water table, or seepage problems except where water tolerant vegetation can be used.

.14.7 Vegetative Stabilization<u>-</u> Permanent vegetation of constructed waterways will be established in accordance with the applicable standard "Planting for Erosion Control" or "Sodding".

.14.8 Construction Specifications -

(a) All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the waterway.

(b) The diversion shall be excavated or shaped to line, grade, and cross section as required to meet the criteria specified here, free of irregularities that will impede normal flow.

(c) Fills shall be compacted as needed to prevent unequal settlement that would cause damage in the complete waterway.

(d) All earth removed and not needed in construction shall be spread or disposed of so that it will not interfere with the functioning of the waterway.

31 25 00.15 Lined Waterway or Outlet

.15.1 Definition - A waterway or outlet with an erosion resistant lining of concrete, stone, or other permanent material. The line section extends up the side slopes to designed depth. The earth above the permanent lining may be vegetated or otherwise protected.

.15.2 Scope - This standard applies to waterways or outlets with linings of nonreinforced, cast in place concrete; flagstone mortared in place; rock riprap or similar permanent linings. It does not apply to irrigation ditch and canal lining, grassed waterways with stone centers, or small, lined sections to carry prolonged low flows. The maximum capacity of the Page | 12 waterway flowing at designed depth shall not exceed 100 cfs.

.15.3 Design Criteria (Capacity) - The minimum capacity shall be adequate to carry the peak rate of runoff from a 10-year frequency storm. Capacity shall be computed using Manning's formula with a coefficient of roughness "n" as follows:

Concrete:

Trowel finish	012014
Float finish	013 017
Gunite	016 022
Flagstone	020025
Riprap	04d50 1/6 where "d" is in feet

For design of riprap, see National Cooperative Highway Research Program Report 108. "Tentative Design Procedure for Riprap - Lined Channels", or other accepted procedures.

.15.4 Velocity - Maximum design velocity shall be as shown below. Except for shot transition sections, flow in the range of 0.7 to 1.3 of the critical slope must be avoided unless the channel is straight. Velocities exceeding critical will be restricted to straight reaches.

Design Flow Depth	Maximum Velocity
05'	25 fps
.5 - 1.0'	15 fps
1.0'	10 fps

Waterways or outlets with velocities exceeding critical shall discharge into an energy dissipater to reduce velocity to less than critical.

.15.5 Cross-Section - the cross-section shall be triangular, parabolic, or trapezoidal. Monolithic concrete may be rectangular.

.15.6 Freeboard - The minimum freeboard for lined waterways or outlets shall be 0.25' above design high water in areas where erosion resistant vegetation cannot be grown adjacent to the paved side slopes. No freeboard is required where good vegetation can be grown and is maintained.

.15.7 Side Slope - Steeped permissible side slopes, horizontal to vertical will be as follows:

Non-reinforced concrete

Hand-placed, formed concrete:
Height of lining 1.5 ft. or less - vertical
Hand-placed, screeded concrete or mortared
in-place flagstone:
Height of lining less than 2 ft. - 1 to 1
Height of lining more than 2 ft. - 2 to 1
Slip form concrete
Height of lining less than 3 ft. - 1 to 1
Rock Riprap - 2 to 1

.15.8 Lining Thickness - Minimum-lining thickness shall be as follows: Concrete - 4 inches Rock riprap - maximum stone size plus thickness of filter or bedding Flagstone - 4 inches, including mortar bed

.15.9 Related Structures - Side inlets, drop structures, and energy dissipaters shall meet the hydraulic and structural requirements for the site.

.15.10 Filters or Bedding - Filters or bedding to prevent piping, reduce uplift pressure, and collect water will be used as required and will be designed in accordance with accepted engineering principles. Weep holes and drains will be provided as needed.

.15.11 Concrete - Concrete used for lining shall be so proportioned that it is plastic enough for thorough consolidation and stiff enough to stay in place on side slopes. A dense, durable product will be required. A mix that can be certified as suitable to produce a minimum strength of at least 3,000 pounds per square inch shall be used. Cement used shall be portland cement, Type I or II. Aggregate used shall have a maximum size of 1-1/2 inches.

.15.12 Mortar - Mortar used for mortared in-place flagstone shall consist of a workable mix of cement, sand, and water with a water, cement ratio of not more than 6 gallons of water per bag of cement.

.15.13 Contraction_Joints_- Contraction Joints in concrete linings, where required, shall be formed transversely to a depth of about one-third the thickness of the lining at a uniform spacing in the range of 10 to 15 feet.

.15.14 Rock Riprap of Flagstone - Stone used for riprap shall be dense and hard enough to withstand exposure to air, water, freezing, and thawing. Flagstone shall be flat for ease of placement and have the strength to resist exposure and breaking.

.15.15 Vegetative Establishment - All disturbed areas shall be vegetated in accordance with the standard "Planting for Erosion Control."

.15.16 Construction Specifications<u>-</u> (a) The foundation shall be cleared of trees, stumps, roots, sod, loose rock, or other material. (b) The cross-section shall be excavated to the neat

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lines and grades as shown on the plans. Over-excavated areas shall be backfilled with moist soil compacted to the density of the surrounding material. (c) No abrupt deviations from design, grade, or horizontal alignment shall be permitted.

(d) Concrete linings shall be placed to the thickness shown on the plans and finished in a workmanlike manner. Adequate precautions shall be taken to protect freshly placed concrete

Page | 14 from extremely not temperature and to insure proper curing. (e) Filter, bedding, and rock riprap shall be placed to line and grade and in the manner specified. (f) Construction operations shall be done in such a manner that erosion, air, and water pollution will be minimized and held within reasonable and legal limits. The complete job shall be workmanlike and present a good appearance.

31 25 00.16 Topsoiling

.16.1 Definition - The addition of topsoil to a site to be planted to grasses, legumes, shrubs, or trees.

.16.2 Specifications

Topsoil Quality - (a) Topsoil may be any texture except sand, sandy clay, clay loam, silty clay, or clay. (b) The material shall be friable and free of tree roots, noxious weeds, and stones more than 1-1/2 inches in diameter or length, and of other debris. (c) Soil treated with an herbicide will not be used for topsoiling if it is determined that the herbicide will be damaging to desirable vegetation.

Sources of Topsoil - (a) Material for topsoiling shall be taken from the natural surface layers (a horizon) of soils known to be capable of producing good yields of cultivated crops or hay. (b) Topsoil may be stripped from and stockpiled at a site for later replacement. Stockpiled topsoil will not be compacted. (c) Areas from which topsoil has been removed shall be protected against erosion.

Applying Topsoil - (a) Topsoil will not be collected or spread while it is wet. (b) Subsurface will be scarified or otherwise tilled to facilitate bonding prior to spreading topsoil. (c) Topsoil will be uniformly spread to a minimum settled depth of three inches and will be spread to conform with designed finish grades.

Cubic Yards of Topsoil Required to Cover

Depth	1,000	
(inches)	Square Feet	One Acre
1	3	134
2	6	269
3	9	403
4	12	538
5	15	672
6	18	806

1 Cubic Yard - 27 Cubic Feet - 46,656 Cubic Inches 1,000 Square Feet, 1 Inch Deep - 144,000 Cubic Inches - 3.08 1 Acre (43,560 Square Feet), 1 Inch Deep - 6,272,000 Cubic Inches = 134.43 Cubic Yards

Page | 15 **31 25 00.17 Planting for Erosion Control**

.17.1 Definition - Planting vegetation, either permanent or temporary, on areas subject to erosion.

.17.2 Specifications - (Site Preparation): (a) Grading, shaping and other earth moving will be completed to the extent necessary to permit seedings or plantings, either temporary or permanent. The finished grade of slopes with a slope length of more than four (4) feet that are to be planted and maintained in grasses and/or legumes shall be no steeper than 2:1. (Slope lengths steeper than 2:1 and less than four (4) feet long may be seeded.) Similar slopes to be maintained in vines shall be no steeper than 1:1. (b) Concentration of water that will cause excessive erosion while vegetation is being established will be diverted to a safe outlet. Structures used to divert water or provide additional protection to an area may be either permanent or temporary according to the needs of the site; however such structures must conform to the appropriate standards and specifications. (c) Stones, stumps, and trash that will interfere with seedbed preparation, plantings, or the planned use and maintenance of the area will be removed.

.17.3 Providing for Short-Term Cover (Mulching) - Mulch alone may be used to provide short-term protection against erosion. Mulches will be applied and anchored in accord with the provisions of the standard and specification for "Mulching".

Planting for Short Term Cover_(Seedbed Preparation) - (a) Tillage shall be the minimum needed to break compaction, incorporate fertilizers when incorporation of them is required, and provide enough loose soil to cover the seed when the seed is to be drilled or covered by harrowing. Tillage may be incidental to grading or shaping and may be excluded on newly graded areas that will be seeded before a crust can form. (b) Tillage maybe by any suitable implement. (c) Tillage will be on the contour or across the slope where it is feasible.

Plant Selection - (a) Refer to Table 1 for species, planting rates, and planting dates. (b) Select the species that are best adapted to the site and to the needs and desires of the land user.

Seeding - (a) Seed may be placed by the most convenient available method. Regardless of the method used, the seed must be distributed uniformly.

Lime and Fertilizers - (a) Lime will not be required for short-term seedings unless a soil test shows the pH to be below 4.5 or unless it is desirable to apply lime for the benefit of a long-term planting which will follow the short-term seeding. When lime is applied, it will be uniformly spread and incorporated into the soil. (b) A minimum of 500 pounds per acre (11.5 pounds per 1,000 square feet) of 10-10-10 fertilizer, or the equivalent, will be uniformly applied at planting time unless a soil test indicates the need for a different rate or analysis of fertilizer. Additional nitrogen applied later as a top-dressing, may be required for some seeding.

.17.4 Planting for Long-Term Cover - (Preparing the Soil for planting) -(a) Preparation shall consist of the least tillage necessary to break compaction, incorporate lime and fertilizers where incorporation of them is required, and allow the proper placement of seed, sprigs, or plants. Preparation may be incidental to grading and shaping and may be eliminated when: (1) Page | 16 Earthwork has been recently completed and the area will be seeded to grasses or legumes before a crust can form. (2) Grasses or legumes are to be planted directly into the stubble of a temporary cover crop or on top of a mulch. (b) Tillage may be by any suitable implement. (c) Tillage will be on the contour or across the slope where it is feasible. (d) Site preparation by furrowing, discing, scalping, or bedding will be required where trees or shrubs are to be planted in a heavy vegetative cover. Grass and legumes will be planted between rows of trees or shrubs on bare or sparsely vegetated areas.

Plant Selection - (a) Refer to Tables 2 and 3 for plants, planting rates, and planting dates. (b) Plants shall be selected on the basis of species characteristics, site and soil conditions, the planned use and maintenance of the area, the time of year the planting is to be made, and the needs and desires of the land user. (c) Seeding mixtures intended to provide long-term, low maintenance cover for critical areas will ordinarily include a perennial legume and one or more perennial grasses. For sod specifications, refer to the standard and specifications for "Sodding". (d) Seeding mixtures may include nurse crops of a small grain or a grass for quick cover (such as rye or brown top millet); however, the rate of the nurse crop in a mixture shall be no greater than 25% of the rate usually used when it is seeded alone. (e) The planting rates listed in Table 2 may be adjusted to meet special conditions and to accord with local experience; however, the approximate ratios of species in mixtures indicated in Table 2 will be maintained.

Seeding and Planting - (a) Grasses and legumes shall be planted uniformly. Drilling, broadcasting, or hydroseeding methods may be used. Seed planted by broadcasting shall be lightly covered by rolling or harrowing in all areas accessible to implements. Seeds of legumes intended to provide long-term cover inoculated with an inoculant appropriate for the species immediately prior to planting. (b) Trees, shrubs, and vines may be planted with appropriate planters, seeders, or hand tools. Each plant will be set in a manner that will avoid crowding the roots, and soil shall be firmed about the roots. Seedlings shall be planted at a depth nearly equal to or slightly deeper than the depth at which they were originally growing.

Lime and Fertilizer - (a) Unless a soil test indicates different requirements, lime and fertilizers will be applied at rates that equal or exceed those shown below when planting grasses and legumes. (1) Agricultural limestone: 1-1/2 tons per acre (70 pounds per 1,000 square feet), or the equivalent. (2) Fertilizers as one of the following: 1,000 pounds per acre (23 pounds per 1,000 square feet) of 10-10-10 fertilizer, or the equivalent at planting time, or 1,000 pounds of 5-10-10 fertilizer per acre (23 pounds per 1,000 square feet) at planting time plus a top dressing of fertilizer at a later date. The top-dressing shall include a minimum of 50 pounds per acre (1.1 pounds per 1,000 square feet) of available nitrogen where grasses are to be encouraged and a minimum of 40 pounds per acre (0.9 pounds per 1,000 square feet), each, of P2O5 and K2O where legumes are to be encouraged. (b) No lime and/or fertilizer will be applied without a soil test when planting trees or shrubs.

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Mulching - (a) Mulch is used to provide necessary additional protection against erosion and/or to aid in the establishment of plant cover. Refer to the standard and specification for materials, rates, and methods of anchoring mulches. (b) Steep slopes will be mulched as soon as possible after planting, but in no case will mulching be delayed more than forty-eight (48) hours after planting. (c) Seedings made so late in the fall or winter that germination cannot be expected until spring (dormant seedings) will be mulched. (d) Appropriate mulch materials may be applied simultaneously with seed and fertilizer when they are applied by a hydroseeder.

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.17.5 Hydraulic_Seeding Methods (Hydroseeding) - (a) Lime, fertilizers, seeds, and appropriate mulch materials may be applied simultaneously in a mixture of these materials and water by a hydroseeder. The water and materials mixture (slurry) will be uniformly applied at a rate that will not cause erosion. (b) Legumes will be treated with four times the manufacturer's recommended rate of inoculant when they are planted by a hydroseeder.

.17.6 Management of Plantings to Secure Cover - (a) Planted areas shall be protected from damage by fire, grazing, weed competition, and traffic. (b) Additional fertilizer shall be applied as needed, to obtain vigorous growth and desirable density and composition of vegetation.

31 25 00.18 Mulching

.18.1 Definition - Applying plant residues or other suitable materials not produced on the site to the soil surface.

.18.2 Specifications (Site Preparation) - Construction work and/or plantings shall be completed according to appropriate specifications or plans prior to applying a mulch.

.18.3 Mulching_Materials - (a) The mulch materials that best meet the needs of the site and the desires of the land users shall be selected from the list which follows. All materials shall be uniformly distributed at the rate indicated.

(1) Small Grain Straw and Hay - Apply 1-1/2 to 2 tons per acre of 70 to 90 pounds per 1,000 square feet. The material must be dry and free of coarse stems, mold damage, and noxious weeds. It will be anchored where there is danger of it being blown or washed away.

(2) Pine Straw - Apply one-half inch deep on area plantings or from four to six inches deep around individual trees, shrubs, or vines. Needles from long-leaved species of pines will be used.

(3) Sericea Seed-Laden Hay - Apply at rates of two to four tons per acre or 90 to 180 pounds per 1,000 square feet as needed to cover the ground 100%. The sericea shall be cut when about 75% of the seeds are brown and shall be taken from fields that reasonably could be expected to produce at least 300 pounds of hulled seed per acre.

(4) Juts Fiber Matting (Soil Antiwash, Erosinet, or the equivalent) - Matting shall be placed in contact with the soil loosely but smoothly. When used in areas of concentrated flows, matting shall be installed in accord with the provisions of Figure 1. Staples used to anchor matting shall be six inches in length, one inch wide at the crown and made from No. 11 (0.120 inch diameter) wire. One-half of the seed to be sown on matted areas shall be sown before the

matting is placed. Adjacent strips of matting shall be overlapped approximately two inches and the overlap stapled in the same manner as an edge.

(5) Barnyard Manure - Apply at the rate of eight tons per acre or 70 to 90 pounds per 1,000 square feet. Manure with a high straw content will be used. Barnyard manure will not be used to mulch frozen soil when its odor will be objectionable, or where surface waters will be

Page | 18 contaminated.

(6) Wood Cellulose Fiber - Apply at a minimum rate of 1,000 pounds per acre or 25 pounds per 1,000 square feet with a hydro-seeder. The use of this material is limited to flatter slopes and to optimum seeding dates.

(7) Wood Chips - Apply in layers two to six inches deep or 460 to 920 pounds per 1,000 square feet. The application of wood chips is limited to flatter slopes and is prohibited in areas subject to a concentrated flow of water.

(8) Liquid Asphalt (Cutback Asphalt) - Spray 1,250 gallons per acre or 28.7 gallons per 1,000 square feet of the slow curing (SC) type. (Caution: This material sheds water and may inhibit the growth of seeds planted on dry soils).

(9) Burlap, Tobacco Cloth, and other Cloths - Materials will be spread loosely but smoothly over the area to be protected and anchored to prevent washing or blowing away.

(10) Other Materials - Mulch materials other than those listed above, may be used provided they: (a) fulfill the purposes listed in the standard and, (b) are applied according to the manufacturer's specifications or current USDA, or Clemson University publications.

.18.4 Mulch Anchoring Materials and Methods - (a) The material or method best suited to the mulching material used, the site, and the desires of the land user will be selected from the list below.

(1) Punching into the Soil - Ends of fibers will be pushed into the soil approximately three inches by passing over them with a special implement built for the purpose, or a farm disc set straight, or by the use of a shovel in small areas.

(2) Asphalts - (a) Liquid asphalt of the rapid (RC) or medium (MC) curing types will be sprayed on hay or straw mulched areas at the minimum rate of 300 gallons per acre of 6.9 gallons per 1,000 square feet. (b) Asphalt emulsions; types SS-1, MS-2, RS-1, or RS-2 may be either injected into hay or straw mulch as it is blown on or sprayed on top of the mulch after it is spread. When the asphalt emulsion is blown on with the mulch, the rate of application will be a minimum of 250 gallons per acre (3.4 gallons per 1,000 square feet), and when it is sprayed on the mulch the rate will be 300 gallons per acre (6.9 gallons per 1,000 square feet). No asphalt emulsions that have been allowed to freeze will be used, and the material will be kept between 75 and 160 degrees F while it is being applied.

(3) Paper Twine Fabric, Mulch Netting and Other Net Materials These materials shall be installed in accordance with the provisions of Figure 2. Staples used to anchor nettings shall be six inches in length, one inch wide at the top, and made from No. 11 (0.120 inch diameter) wire. Rolls of netting may be installed with the length either up and down the slop or across it.

(4) Pegs and Twine - This method will be used on hay or straw and other long-fiber mulches only. Pegs 8" to 20" long will be set on intervals of approximately 3 feet by 3 feet and driven within 3" of the soil surface. Twine will then be used to form a net between pegs. The twine will be looped around each peg twice and the slack pulled out between pegs. After the net is woven, the pegs will be driven in until their tops are flush with the soil's surface.

(5) Rye_or Millet Seed - Rye or millet seed may be added to appropriate seeding mixtures for the purpose of anchoring mulches. Rates will not exceed 20 pounds of brown top millet or 15 pounds of rye per acre.

(6) Other_Mulch Anchoring Materials and Methods - Materials and methods for
anchoring mulches other than those listed above may be used provided: (a) They adequately
protect the mulch against wind or water erosion. (b) They are practical and feasible. (c) They are acceptable to the landowner or user.

31 25 00.19 Sodding

.19.1 Definition - Planting sod of adapted perennial grasses.

.19.2 Specifications - Site Preparation - (a) All grading, shaping, and other earth moving shall conform to appropriate plans or specifications prior to placing sod. (b) All rocks, roots, waste materials, and other trash that will interfere with placing or maintaining sod or the planned use of the area will be removed. (c) Topsoil, when it is used, shall be uniformly spread to a minimum settled depth of three inches.

.19.3 Tillage - (a) Sites to be sodded shall be tilled to the minimum extent necessary to break compaction or surface seals, incorporate lime and fertilizer, and provide enough loose soil for fine finish grading where a lawn-like turf is to be established.

(b) Tillage may be by any suitable implement or combination of implements and will be on the contour or across the slope where it is feasible. (c) Final tillage operations shall leave the soil smooth and firm. Areas to be established in lawn-like turf shall be rolled prior to placing sod. Any depressions revealed that will cause water to stand shall be filled, and any mound that will cause scalping when the grass is mowed shall be leveled.

.19.4 Sod Quality - (a) Sod intended primarily for erosion control or where aesthetic values are of minor importance may be taken from fields that have dense, vigorous standards of desirable species relatively free of weeds. (b) Sod to be used where aesthetic values are important will be taken from sod nurseries where the turf is known to be true to type and of uniform, high quality. (c) Sod may be cut into uniform blocks or strips of any convenient dimensions to facilitate handling; however, the edges must be cut straight and smooth. The thickness of each piece (combined soil and root depth and exclusive of crowns, stems, and leaves) shall be no more than one (1) inch. (d) Sod that has become heated or dried will not be used. (e) No area stripped of sod will be left without adequate protection against erosion.

.19.5 Lime and Fertilizer - (a) The required amounts of lime and fertilizer will be incorporated into the soil. Incorporation may be incidental to tillage. (b) Unless a soil test indicates different needs, the following minimum amounts of lime and fertilizer will be applied: Lime - One ton per acre or 46 pounds per 1,000 square feet. Fertilizer - One thousand pounds per acre or 23 pounds per 1000 square feet of 10-10-10 fertilizer or the equivalent.

.19.6 Placing Sod - (a) Dry soils will be watered prior to placing sods. (b) Placement will begin at the lower end of slopes and channels with the longest axis of the sod pieces aligned across the slope or channel. Joints between pieces will be staggered between rows, and each

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piece will be placed as snugly as possible against the adjacent one. Any small gaps or voids remaining after the sod pieces are laid will be filled with topsoil. (c) Outer border pieces or strips of sod placed in channels will be set low enough that water entering the channel from the side will flow over them. (d) Newly placed sod in danger of slipping on steep slopes before the new root system can develop will be anchored with wooden pegs or wire staples. (e) Freshly placed sod in areas planned for high intensity use will be rolled or tamped where it is feasible, then watered until the water penetrates the soil beneath the sod.

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.19.7 Time of Sodding - Sodding may be done any time during the growing season, but must be completed at least four weeks before the end of the growing season or before the newly sodded area is used intensively.

31 25 00.20 Open Channel

.20.1 Definition - Constructing or improving a channel, either natural or artificial, in which water flows with a free surface.

.21.2 Design_Criteria - Location - The alignment of channels shall not be changed to the extent that the stability of the channel or laterals thereto is endangered.

.21.3 Channel Capacity - The capacity for open channels shall be determined by procedures applicable to the purposes to be served, and in accordance with sound engineering principles.

The water surface profile or hydraulic grade line for design flow shall be kept below bank level for all significant areas. The "n" value for aged channels, assuming the expected maintenance, shall be used in this computation. The required capacity shall be based on peak flows for the design storm consistent with the purpose of the channel, desired level of protection, and economic feasibility.

In urban or urbanizing areas, a channel with its associated floodway should be designed to convey the 100-year storm without permitting floodwater to damage homes, buildings, or other valuable property.

.21.4 Hydraulic Requirements - Manning's formula shall be used to determine the velocities in the channels. The "n" values for use in this formula, when designing channels to be constructed or modified, shall be estimated using sound engineering references.

.21.5 Channel Cross Section - The required channel cross section and grade are determined by the design capacity, the materials in which the channel is to be constructed, and the requirements for maintenance. A minimum depth may be required to provide adequate outlets for subsurface drains, tributary ditches or streams. Developments through which the channel is to be constructed must be considered in design of the channel section. Safety considerations are important in the selection of the cross section in urban areas.

.21.6 Channel Stability - Characteristics of a stable channel are: (a) It neither aggrades or degrades beyond tolerable limits. (b) The channel banks do not erode to the extent that the channel cross-section is changed appreciably. (c) Excessive sediment bars do not develop. (d)

Excessive erosion does not occur around culverts and bridges or elsewhere. (e) Gullies do not form or enlarge due to the entry of uncontrolled surface flow to the channel.

All channel construction and modification shall be in accordance with a design that can be expected to result in a stable channel that can be maintained at reasonable cost.

Channel stability shall be determined for an aged condition, and the velocity shall be based on the design flow or the bank full flow, whichever is <u>greater</u>, using an "n" value based on the expected kind and density of vegetation and assuming good maintenance. The discharge used in stability analyses of channels having a controlled inflow shall be their design flow.

Channels also must be stable under conditions existing immediately after construction. For this stability analysis, the velocity shall be calculated for the expected flow from a ten-year frequency storm on the watershed, or the bank full flow, whichever is <u>smaller</u>, and the "n" value for the newly constructed channel shall be used. The "n" values of newly constructed channels in fine-grained soils and sands generally should not exceed 0.025.

.21.7 Travel ways for Maintenance - Travel ways for maintenance shall be provided as a part of all channel modification. A travel way shall be provided on each side of large channels if necessary for use of maintenance equipment. Travel ways must be adequate for movement and operation of equipment required for maintenance of the channel.

21.8 Appurtenant Structures - The design of channels should provide for all structures required for the proper functioning of the channel and the laterals thereto and travel ways for operation and maintenance. Recessed inlets and structures, needed for entry of surface and subsurface flow into channels to prevent significant erosion or degradation, shall be included in the design of the channel. If the proposed channel bottom elevation is below the elevation of the bottom of a lateral channel at their junction to the extent that a recessed inlet is not feasible, the lateral channel must be stabilized by a sound structure.

The effect of channel modifications on existing culverts, bridges, buried cables, pipelines, and other fixed improvements shall be evaluated to determine the need for modification or replacement.

Culverts and bridges which are modified or added as part of channel improvement projects shall meet reasonable standards for the type of structure and shall have a minimum capacity equal to the design discharge. When the design discharge is based on storms which occur frequently, i.e., storms of one or two-year frequency, it may be desirable to increase the capacity of the culverts and bridges above the design discharge. When a county, city, state, or federal highway is involved, the responsible agency will determine the capacity of the bridge or culvert required.

.21.9 Disposition of Spoil - Spoil material resulting from clearing, grubbing, and channel excavation shall be disposed of in a manner which will: (a) Minimize over bank wash, (b) Provide for the free flow of water between the channel and flood plain unless the valley routing and water surface profile are based on continuous dikes being installed, (c) Not hinder the development of travel ways for maintenance, (d) Leave the right of way in the best condition feasible, consistent with the project purposes, for productive use by the owner, and (e) Improve the aesthetic appearance of the site to the extent feasible.

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.21.10 Vegetative Establishment - Vegetation shall be established on all bare areas including the channel banks in accordance with the standard "Planting for Erosion Control".

.21.11 Construction Specifications <u>-</u> Specifications for open channels shall be in keeping with this standard and shall be prepared for each job depending upon its location and intended Page | 22 purpose.

31 25 00.22 Clearing and Snagging

.22.1 Definition - Removing snags, drifts, or other obstructions within a channel.

.22.2 Design Criteria - The channel capacities, both before and after improvement, shall be determined by using the Manning equation, using applicable value of the retrace factor, "n", or both conditions. The value of "n" used to determine channel capacity after improvement shall reflect the degree of maintenance expected in future years.

The area to be cleared and snagged shall include the perimeter of the channel, the flow area of the floodway, or both. Adjacent trees or other objects that may fall into the channel shall also be included. Clearing and snagging may also be specified for other areas, including berms, for use as temporary disposal areas, for travel ways, or for planned conservation uses.

.22.3 Channel Stability - The stability of the channel shall not be impaired due to the clearing and snagging. Instability resulting from this practice shall be corrected.

.22.4 Vegetative Stability - Disposal areas or any denuded areas resulting from the clearing and snagging operations should be vegetated in accordance with the standard "Planting for Erosion Control."

.22.5 Construction Specifications - All trees, stumps, and brush within the perimeter of the channel shall be cut as close to ground level as the cutting tools will permit. Where other areas are to be cleared, the trees, brush, and other woody vegetation shall be cut within the maximum distance above ground level required by the planned use of the areas and/or as specified in the project plan.

Trees shall be felled in such a manner as to avoid damage to other trees, property, and objects located outside the limits of clearing.

Down trees, logs, drifts, boulders, debris, and other obstructions, lying wholly or partially within the channel, shall be removed. Piling, piers, headwalls and sediment bars that obstruct the free flow of water will be removed when so designated in the plans.

The use of explosives in any and all clearing and snagging operations shall strictly comply with applicable state statutes and regulations.

Trees, logs and all combustible material resulting from the clearing and snagging operations shall be burned, buried, piled in a designated disposal area, or otherwise disposed of as specified for the project. The residue from burning and noncombustible material will be buried outside the channel or placed in designated disposal areas. All buried material will be covered with earth to permit the planned land use.

31 25 00.23 Grade Stabilization Structure

.23.1 Definition - A structure to stabilize grade or to control head cutting in natural or artificial channels. (This standard applied to all types of grade control structures. It does not apply to storm sewers or their component parts.)

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.23.2 Design Criteria - Compliance with Laws and Regulations - Design and construction shall be in compliance with state and local laws and regulations.

.23.3 General - Designs and specifications shall be prepared for each structure by an engineer or on an individual job basis, depending on its intended purpose, site conditions, and the basic criteria of the conservation practice with which the structure is planned. The following items contain information on some typical structures:

(1) Channel linings of concrete, asphalt, half-round metal pipe, gabions, or other suitable lining materials. These linings should generally be used where channel velocities exceed safe velocities for vegetated channels or where durability of vegetative lining is adversely affected by seasonal changes. Adequate protection will be provided to prevent erosion or scour of both ends of the channel lining.

(2) Outfall structures of concrete, rock riprap, or other suitable material used to lower water from one elevation to another. These structures are applicable where it is desirable to drop the watercourse elevation over a very short horizontal distance. Adequate protection will be provided to prevent erosion or scour upstream, downstream and along sides of outfall structures.

(3) Pipe drops of metal pipe with suitable inlet and outlet structures. The inlet structure may consist of a vertical section of pipe or similar material, a standard flared end section, an embankment or a combination of these. The outlet structure will provide adequate protection against erosion or scour at the pipe outlet.

.23.4 Capacity - Structures that are designed to operate in conjunction with other erosion control practices shall have a minimum capacity sufficient to handle the bank full capacity of the channel or pipe delivering water to the structures.

Peak runoff values, used to determine the capacity requirements of grade control structures, shall be computed using an accepted method.

Structures will involve the retarding of floodwater, or the impoundment of water shall be designed using storm frequency to provide protection consistent with the hazard or damage that would occur if structures should overtop or break.

Island type structures shall be proportioned to discharge a capacity equal to the downstream channel capacity at bank full stage.

.23.5 Design Velocities - Design velocities shall be determined using Manning's formula or other appropriate and accepted procedures. The design velocities computations will be based upon a roughness coefficient "n" commensurate with the type of channel lining used. Design velocities will be in the safe range for the type of channel linings used and will be based on the design peak flow. Values of "n" to be used for different type linings are given below:

Values of "n" to be used with Manning's Formula*
Surface	Best	Good
Cast Iron Pipe	.011	.012
Wrought Iron Pipe (Galvanized)	.013	.014
Riveted and Spiral Steel Pipe	.013	.015

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Values of "n" to be used with Manning's Formula*

Surface	Best	Good
Vitrified Sewer Pipe	.010	.013
Clay Drain Tile	.011	.012
Brick in Cement Mortar	.012	.013
Concrete Pipe	.012	.013
Concrete Lined Channels	.012	.014
Semi-Circular Metal Flumes, Smooth	.011	.012
Semi-Circular Metal Flumes, Corrugated	.0225	.025

*From King's Handbook of Hydraulics

.23.6 Foundation Investigations - Foundation investigations shall be made at each site. Sufficient soil borings shall be made at the structure site to determine suitability of the site for the proposed structure.

The foundation material shall (1) have required supporting strength, (2) be resistant to sliding and to piping, and (3) possess uniform consolidation characteristics.

.23.7 Vegetative Stabilization - Dikes, embankments, diversions, or other earthwork including borrow areas or other disturbed areas, shall be properly vegetated in accordance with the standard "Planting for Erosion Control" and/or other applicable standards.

.23.8 Construction Specifications - The quality, proportioning, strength, and placement of the specified construction materials shall be in accordance with the engineer's design.

31 25 00.24 Stream bank Protection

.24.1 Definition - Stabilizing and protecting banks of streams or excavated channels against scour and erosion by structural means.

.24.2 Scope - This standard covers structural measures used to stabilize and protect the banks of natural streams and excavated channels. It does not cover the vegetative measures that may be used for streambank protection, either when used alone or to supplement the mechanical measures.

.24.3 Design_Criteria - Since each reach of channel is unique, measures for streambank protection must be installed according to a plan and adapted to the specific site. Designs shall be developed in accordance with the following principles:

(1) Protective measures to be applied shall be compatible with improvements planned or being carried out by others.

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(2) The grade must be controlled; either by natural or artificial means, before any permanent type of bank protection can be considered feasible unless the protection can be safely and economically constructed to a depth well below the anticipated lowest depth of bottom scour.

(3) Streambank protection shall be started and ended at a stabilized or controlled point on the stream.

(4) Needed channel clearing to remove stumps, fallen trees, debris, and bars which force the stream flow into the streambank shall be an initial element of the work.

(5) Changes in channel alignment shall be made only after an evaluation of the effect of the land use, interdependent water disposal system, hydraulic characteristics, and existing structures.

(6) Structural measures must be effective for the design flow and be able to withstand greater floods without serious damage.

(7) Vegetative protection shall be considered on the upper portions of eroding banks and especially on those areas that are subject to infrequent inundation.

.24.4 Construction Specifications - Measures and construction methods that enhance fish and wildlife values shall be incorporated as needed and practical. Special attention will be given to protecting and maintaining key shade, food, and den trees and to stabilization of disturbed areas. Removal of any trees and brush required will be done in such a manner as to avoid damage to other trees and property.

Disposal of trees, brush, and other material will be done in such a manner as to have the least detrimental effect on the environment.

Construction operations shall be carried out in such a manner that erosion, and air and water pollution will be minimized and held within legal limits.

The completed job shall present a workmanlike finish.

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SECTION 31 30 00 - EARTHWORK

Section 31 30 00.1 General

This specification is intended to be a part of the contract documents and to be included in the Contract Agreement as executed. It is intended to be a supplement to the approved Geotechnical Report for this project. Where there is a conflict between this specification and the geotechnical report, the geotechnical report will govern.

Section 31 30 00.2 Scope

This specification governs the technical requirements for earthwork and grading including clearing, grubbing, topsoil handling and stockpiling, handling of borrow and waste, temporary erosion and sediment control, and other necessary activities to grade the site to the lines, grades, and sections indicated on the design drawings.

Section 31 30 00.3 Related Work Specified Elsewhere

.3.1

Section 31 10 00 General Sitework, Section 32 92 00 Temporary Erosion Control, Section 31 25 00 Erosion Control, Section 881 Rip-Rap Blanket

Section 31 30 00.4 Reference Codes, Specifications, and Standards

.4.1 Current editions or revisions of the following codes, specifications, and standard shall apply unless modified in this specification or on the design drawings:

.4.1.1 American Society for Testing and Materials—ASTM Applicable Standards

ASTM D698 Standard method of test for moisture density relations of soils (Standard Proctor Method).

ASTM D1557 Standard method of test for moisture density relations of soils. (Modified Proctor Method).

ASTM D1556 Standard method of test for density of soil in place by the sand-cone method.

ASTM D2937 Standard method of test for density of soil in place by the drive cylinder method.

ASTM D2922 Standard method of test for density of soil in place by the nuclear method.

ASTM D3017 Standard method of test for moisture of soil in place by the nuclear method.

ASTM D2049 Standard method of test for relative density of cohesionless soils.

ASTM D2167 Standard method of test for density of soil in place by the rubber balloon method.

ASTM D2487 Classification of soils for engineering purposes.

- .4.1.2 International Building Code, 2006 Edition.
- .4.1.3 All applicable local, county, state, and federal codes and OSHA

Section 31 30 00.5 Clearing and Grubbing

- .5.1 This section shall govern clearing and grubbing of land located within the limits shown on the plans, together with areas for borrow pits, disposal areas, and the areas of roads, parking areas, railroads, buildings, and structures.
- .5.2 In excavation areas and fill areas, all trees, stumps, roots, stubs and brush more than two inches in diameter shall be cut off, excavated, and removed to a depth of not less than two feet below the ground surface and the entire area grubbed free from heavy vegetation, grass, roots, rubbish and refuse. In areas of clearing and grubbing where no further earthwork will occur, all excavations made for the removal of trees, stumps, etc., shall be filled with suitable material and compacted thoroughly so as to make the surface of these sections conform to the surrounding surface. In fill areas, all soil disturbed as a result of clearing and grubbing operations shall be recompacted in accordance with the geotechnical report for this project.
- .5.3 Trees, bushes, shrubs or growth designated by the Owner to remain shall be protected and saved from harm during the progress of the work. No trees, bushes, or shrubs outside the initial construction area shall be damaged in any manner.
- .5.4 All materials resulting from clearing and grubbing operations shall be removed from the site and legally disposed of at no additional cost. Upon completion of the operations, nothing shall remain within limits of the site which was deposited as a result of the clearing and grubbing operations.

Section 31 30 00.6 Topsoil

.6.1	Topsoil sh use. The t less than f manager a stock piles offsite stor representa excavated undesirabl	Topsoil shall be excavated in cut and fill areas and stored for later use. The topsoil shall be excavated to the depths as directed, not less than four inches, and shall be quantified by the construction manager and transported and deposited by the contractor in offsite stock piles to be obtained and maintained by the contractor. These offsite stock pile areas must be accessible to the owner or owner's representative at all times. Topsoil shall be kept separated from other excavated materials, and shall be piled free of roots and other undesirable material.		
.6.2	Following finished grading operations, the graded areas which not to be further improved or used for material storage, ponds, shall be overlaid with topsoil of a compacted thickness of 4 in minimum prior to grassing operations.			
	.6.2.1	The topsoil shall be obtained from stockpiles and placed on the areas at times when the subgrade is not muddy.		
	.6.2.2	The spreading shall be uniform and once spread, the topsoil shall be compacted.		
	.6.2.3	Prior to completion, the areas shall be dragged so that the surface is free of roots, sticks, and other vegetation remains.		
	Section	a 31 30 00.7 Materials		
.7.1	Structural shall confe Geotechni to be used manager a locations o stock pile representa approve al project.	Fill (Borrow) The materials used for structural fill/borrow orm to the guidelines outlined in the approved cal Report for this project. All excavated materials that are as structural fill are to be quantified by the construction and transported stockpiled by the contractor off site in obtained and maintained by the contractor. These offsite areas must be accessible to the owner or owner's tive at all times. The project Geotechnical Engineer shall ll material to be used for structural fill/ borrow on this		
.7.2	All other r Geotechni	naterial requirements shall be as directed by the approved cal Report for this project.		
.7.3	Unsuitable	e Material		
	Unsuitabl excavation	e material is defined as material encountered in ns or at the level of subgrade which does not meet the		

requirements of Section 31 30 00.8. This material shall be removed and disposed of and replaced with suitable structural fill to the extent recommended by the geotechnical consultant's field representative.

Section 31 30 00.8 Earthwork and Rough Grading

.8.1 This section shall govern the excavating for cut and the moving and placing of all fill materials necessary for grading of the general site, subgrades for roads, parking areas, buildings, and open ditches and is exclusive of the work necessary for construction of foundations for buildings, and other structures.

- .8.2 General
- .8.2.1 High areas shall be cut to the grade shown. All suitable material removed from the excavations shall be used, insofar as practicable, in the formation of fills and slopes. All unsuitable material or surplus excavated material shall be quantified by the construction manager and wasted or stock piled offsite by the contractor in locations obtained and maintained by the contractor. These off site stock pile areas must be accessible to the owner or his representative at all times.
- .8.2.2 Roads, parking areas, and building areas shall be excavated or filled to subgrade elevations shown on the plans. Should ledge rock be encountered through cut sections, the rock shall be excavated to one foot below subgrade elevation and backfilled to the proper elevation as specified in Paragraph 31 30 00.8.3.

Section 31 30 00.8.3 Excavations

- .8.3.1 Cuts in earth occurring beneath roads and parking areas shall have a layer two feet in depth immediately below the subgrade compacted at plus or minus three percent of optimum moisture content to a density of not less than 98 percent of the maximum density as determined by ASTM D-698 or as specified on the construction plans or geotechnical report for this project.
- .8.3.2 Cuts in earth occurring beneath buildings shall have a layer one foot in depth immediately below the subgrade compacted at plus or minus three percent of optimum moisture content, to a density of not less than 98 percent of the maximum density as determined by ASTM D-698 or as specified on the construction plans or geotechnical report for this project.

.8.3.3 Field density and moisture tests will be performed in accordance with ASTM D-1556, ASTM D-2167, ASTM D-2937, ASTM D-2922, ASTM D-3017, or ASTM D-2049.

Section 31 30 00.8.4 Embankments

Embankments shall be constructed of earth in compliance with the following subparagraphs:

.8.4.1	After clearing and grubbing operations are complete, all fill areas shall be proof-rolled with heavily loaded pneumatic-tired equipment, such as 15- or 20-ton dump trucks or scrapers. Soil deflecting
	excessively under the moving load shall be undercut and replaced with compacted backfill. The upper 8-inch layer of material shall be compacted to a density not less than 98 percent of the maximum
	density as determined by ASTM D-698 or as specified on the
842	Earth fills shall be constructed of approved earth or friable materials
.0.1.2	which shall be free of organic substances, spongy or frozen soil, and
	other objectionable substances which will prevent satisfactory
	consolidation. Earth or friable materials shall be deposited and
	spread in successive, uniform, approximately horizontal layers not to
	exceed eight inches after compaction. Fill layers shall be constructed
	for the full width of the required cross section, and in such a manner
	that the embankment drains.
.8.4.3	All fills occurring beneath buildings, roads, railroads, parking areas,
	and storage areas shall be compacted at plus or minus three percent
	of optimum moisture content to a density of not less than 98 percent
	of the maximum density as determined by ASTM D-098 of as
	project
844	Other embankments such as pond dikes shall be filled as
	recommended in Geotechnical Report).
.8.4.5	Field density tests will be performed in accordance with ASTM
	D1556, ASTM D-2167, ASTM D-2937, ASTM D-2922, ASTM D-
	3017, or ASTM D-2049.

Section 31 30 00.9 Finish Grading

All exposed earth surfaces shall be finish graded to within plus or minus 0.1 foot of theoretical grade. Roadways and parking subgrade shall be finished to within plus or minus 0.1 foot of theoretical grade. The degree of finish for grading slopes shall be that ordinarily obtainable from either blade-grader or scraper operations or by hand shovel operations. When so directed, the accuracy of finish obtained by the use of templates and stringline or hand-raking methods will be required in the case of shoulders, gutters, and similar areas. All gutters and ditches shall be finished so that they will drain readily.

Section 31 30 00.10 Maintenance and Erosion Control

.10.1	The graded areas shall be maintained by using temporary erosion and sediment control measures during construction until final acceptance by the Owner, or until subsequent building construction or pavement construction has been performed.
.10.2	The portions of the work which have been displaced due to acts of carelessness or negligence, including failure to properly route or contain surface water runoff, shall be repaired or reconstructed at no additional expense to the Owner.
.10.3	The temporary erosion control measures shall be in conformance with local, state, or federal regulations to prevent erosion and subsequent sediment deposition into receiving streams during the construction period.
.10.4	Erosion control and sediment containment measures designed to prevent concentration of runoff in erodible soil conditions, reduce velocity, or detain sediment loss shall be employed. These measures may consist of but are not limited to temporary diversions, berms, slope drains, plow barriers, or silt fences.
	Section 31 30 00.11 TESTING
.11.1	A qualified and experienced testing agency will be employed by the Owner to classify and identify soils, perform quality control testing for densities and moisture, and to perform other testing as directed by the Owner during construction.
.11.2	Density and moisture quality control tests will be performed at the frequencies specified in the Geotechnical Report or as required by the Geotechnical Engineer retained by the owner.
.11.3	The testing agency shall establish Atterburg limits and moisture-density relationships for every change in borrow or in place soil being compacted.
.11.4	Soil shall be compacted to the degree of compaction specified within the moisture contents permitted in the approved Geotechnical Report for this project. Fill sections which are found to be deficient in compaction as a result of density testing shall be removed and replaced or reworked, according to the specification, and retested at no additional expense to the Owner.

Section 31 30 00.12 INSPECTION

The Owner reserves the right to make inspections of the work of clearing and grubbing, grading, topsoil handling, and maintenance throughout the construction period to ensure that work is proceeding as specified on the design drawings and in this specification.

CONCRETE SIDEWALKS

SECTION 32 16 23

32 16 23.1 General

The work covered under this section of these specifications shall be for the construction of concrete sidewalks as detailed on the plans in accordance with SCDOT Standard Specifications, latest edition, or as specified otherwise herein.

32 16 23.2 Concrete Sidewalks

All walks under this section will be governed by Section 720 of SCDOT Standard Specifications for Highway Construction, 1986, latest edition, in its entirety and as detailed in the plans. If not indicated on the drawings, construction joints to be placed ten (10') on centers and expansion joint every thirty (30') feet in the sidewalks. Reinforcement shall be 6x6 WWF. Where sidewalk is 5' wide contractor shall install a control joint every 5' or as specifically indicated on the Architectural Plans. Where sidewalks are shown to be utilized as curbs also, the curb edge shall be constructed as shown on the detail sheet.

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TEMPORARY EROSION CONTROL GRASSING

SECTION 32 92 00

32 92 00.1 General

1.1 This work shall consist of seeding, fertilizing, liming when specified, mulching, and applying nitrogen when specified on all areas shown on the plans or where directed by the Engineer all in accordance with these specifications.

32 92 00.2 Materials

2.1 Seed. All seed shall conform to all State laws and to all requirements and regulations of the South Carolina Department of Agriculture.

The several varieties of seed shall be individually packaged or bagged, and tagged to show name of seed, net weight, origin, germination, lot number, and other information required by the Department of Agriculture.

The Engineer reserves the right to test, reject, or approve all seed before seeding.

Mixtures of different types of seed called for in the seeding schedule shall be weighted and mixed in the proper proportions at the site of the work in the presence of the Engineer.

Unless otherwise provided, the Contractor may select the type of seeding from the table shown below for the upper state and the lower state.

The total pounds of seed per acre shall be the sum total shown for all the varieties of seed opposite the schedule number in the seeding schedules below:

Seeding Schedules for Temporary Vegetation Upper and Lower State

Schedule		Planting	
No.	Common Name of Seed	Rate Rate	Dates
1	Annual Sudan Grass (Sweet or Tift)	40	Apr. 1 –Aug.15
2	Brown Top Millet	50	Apr. 1 - Aug. 15
3	Rye Grain Annual Ryegrass	55 15	Aug. 16-Mar. 31

2.2 Commercial Fertilizers. Commercial fertilizers shall comply with State fertilizer laws.

In a mixed fertilizer such as 4-12-12, the first number shall represent the minimum percent of nitrogen required, the second number shall represent the minimum percent of

available phosphoric acid required, and the third number shall represent the minimum percent of water-soluble potash required in the fertilizer.

2.3 Lime. Lime shall be agricultural grade, ground limestone and shall conform to the requirements of the S.C. Department of Agriculture.

2.4 Emulsified Asphalt SS-1. Emulsified Asphalt SS-1 shall meet the requirements of Subsection 406.06 of the SCDOT standard specifications.

2.5 Emulsified Asphalt RS-2. Emulsified Asphalt RS-2 shall meet the requirements of Subsection 406.06 of the SCDOT standard specifications. The RS-2 emulsion shall be diluted at the manufacturing plant with an equal amount of water. The resulting material shall be homogenous and satisfactory for spraying.

2.6 Straw Mulch. Straw mulch material shall consist of straw or hay. Straw shall be stalks of wheat, rye, barley, oats, or other approved straw. Hay shall consist of timothy, pea vine, alfalfa, coastal bermuda, or other grasses from approved sources. These materials shall be reasonably dry and shall be reasonably free from mature seed-bearing stalks, roots, or bulblets of Johnson Grass, Nutgrass, Sandbur, Wild Garlic, Wild Onion, Wild Mustard, Crotolaria, Pigweed, Witch weed, and Cocklebur. The Contractor shall also comply with all State and Federal domestic plant quarantine regulations.

2.7 Excelsior Mulch. Excelsior mulch shall consist of wood fibers cut from sound, green timber. The average length of the fibers shall be 4 to 6 inches. The cut shall be made in such a manner as to provide maximum strength of fiber, but at a slight angle to the natural grain of the wood so as to cause splintering of the fibers when weathering in order to provide adherence to each other and to the soil.

2.8 Wood Cellulose Fiber Mulch. Wood cellulose fiber mulch shall be made from wood chip particles manufactured particularly for discharging uniformly on the ground surface when dispersed by a hydraulic water sprayer. It shall remain in uniform suspension in water under agitation and blend with grass seed and fertilizer to form homogeneous slurry.

The mulch fibers shall intertwine physically to form a strong moisture-holding mat on the ground surface and allow rainfall to percolate the underlying soil. The mulch shall be heat processed so as to contain no germination or growth-inhibiting factors. It shall be dyed (non-toxic) an appropriate color to facilitate metering of material.

Suppliers shall be prepared to certify that laboratory and field-testing of their product has been accomplished, and that it meets all of the foregoing requirements based upon such testing.

Weight specifications of this material from suppliers and for all applications shall refer only to air-dry weight of the fiber material. Absolute air-dry weight is based on the normal weight standard of the Technical Association of the Pulp and Paper Industry for wood cellulose and is considered equivalent to 10 per cent moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air-dry weight content.

32 92 00.3 Installation

3.1 Stand of Grass. Before acceptance of the seeding performed for the establishment of permanent vegetation, the Contractor will be required to produce a satisfactory stand of perennial grass per SCDHEC standards whose root system shall be developed sufficiently to survive dry periods and the winter weather and be capable of reestablishment in the spring.

Before acceptance of the seeding performed for the establishment of temporary vegetation, the Contractor will be required to produce a stand of grass sufficient to control erosion for a given area and length of time before the next phase of construction or the establishment of permanent vegetation is to commence.

3.2 Seeding Dates and Rates of Application. Seeding shall be performed during the periods and at the rates specified in the seeding schedules. Seeding work may, at the discretion of the Contractor, be performed throughout the year using the schedule prescribed for the given period. Seeding work shall not be conducted when the ground is frozen or excessively wet. The Contractor will be required to produce a satisfactory stand of grass regardless of the period of the year the work is performed.

3.3 Preparation of Ground Before Seeding. The areas to be seeded shall be made smooth and uniform and shall conform to the finished grade and cross section shown on the plans or as otherwise designated. Minor shaping and smoothing of uneven and rough areas outside the graded section shall be performed as directed by the Engineer in order to provide for more effective erosion control and for ease of subsequent mowing operations.

The seedbed, if not loose, shall be loosened to a minimum depth of 3 inches before agricultural lime, fertilizer or seed is applied. The areas to be seeded shall be cleared of stones larger than 2-1/2 inches in any dimension, roots, and other debris.

3.4 Applying Lime and Fertilizer. Following advance preparation, and placing selected material for shoulders and slopes when called for in the contract -- lime if called for--and fertilizer shall be spread uniformly over the designated areas and shall be thoroughly mixed with the soil to a depth of approximately 2 inches. Fertilizer shall be applied at the rate of 500 pounds per acre for the initial application unless otherwise directed. Lime shall be applied at the rate specified in the proposal or as authorized by the Engineer. Unless otherwise provided, lime will not be applied for temporary seeding. In all cases where practicable, approved mechanical spreaders shall be used for spreading fertilizer and lime. On steep slopes subject to slides and inaccessible to power equipment, the slopes shall be adequately scarified. Fertilizer may be applied on steep slopes by hydraulic methods as a mixture of fertilizer and seed. When fertilizer is applied in combination seed and fertilizer drills, no further incorporation will be necessary. The fertilizer and seed shall be applied together when the method of seeding (Wood Cellulose Fiber Mulch) is used. Any stones larger than 2-1/2 inches in any dimension, larger clods, roots, or other debris brought to the surface shall be removed.

3.5 Seeding (Unmatched). Seed shall be sown within 24 hours following the application of fertilizer and lime and preparation of the seedbed as specified in Subsection 503.3.4. Seed

shall be uniformly sown at the rate specified by the use of approved mechanical seed drills. Rotary hand seeders, power sprayers or other satisfactory equipment may be used on steep slopes or on other areas that are inaccessible to seed drills.

The seeds shall be covered and lightly compacted by means of a cultipacker or light roller if the drill does not perform this operation. On slopes inaccessible to compaction equipment, the seed shall be covered by dragging spiked chains, by light harrowing or by other satisfactory methods.

Within 24 hours following compaction of the seeded areas, Emulsified Asphalt RS-2, diluted at the manufacturing plant with an equal amount of water, shall be uniformly applied over the seeded areas at a rate of 0.15 to 0.32 gallon of the dilution per square yard. The exact amount shall be as fixed by the Engineer.

If permitted by the special provisions, wood cellulose fiber mulch or excelsior fiber mulch used and applied as specified for Methods B and C may be used and the 0.15 to 0.32 gallon of the diluted emulsion omitted.

3.6 Seeding (Mulched) Seeding (mulched) shall be performed as specified in Method B. Method B or C will not be permitted except when indicated in the special provisions.

Method A. Seeding (Straw or Hay Mulch). Seed shall be sown as specified in Paragraphs one and two of Subsection 32 92 00.3.5. Within 24 hours following covering of the seed, straw or hay mulch material shall be uniformly applied at the rate of 2 tons per acre. Mulch may be spread either by hand, by appropriate mechanical spreaders, or by blowers. The mulch shall allow sunlight to penetrate and air to circulate but also partially shade the ground and conserve soil moisture. The newly laid mulch shall be held in place as specified in (92); (1) shall not be used unless permitted in the special provisions.

(1) Emulsified Asphalt SS-1 shall be injected into the mulch as it leaves the power driven mulch spreader. The amount shall be approximately 150 gallons per ton of mulch material. The exact amount shall be as fixed by the Engineer and shall be the amount necessary to bond together the mulch particles without giving a heavy coating of the asphalt material and shall prevent wind erosion. Displaced mulch shall be replaced.

(2) Emulsified Asphalt RS-2 shall be diluted at the manufacturing plant with an equal amount of water and shall be uniformly applied over the mulch material as a film. The film shall be applied at approximately 0.20 gallon of dilution per square yard and shall be sufficient to bond together the mulch particles without giving a heavy coating of the asphalt material and shall prevent wind erosion. Displaced mulch shall be replaced.

Method B. Seeding (Wood Cellulose Fiber Mulch). After the lime has been applied and ground prepared as specified in Subsection 32 92 00.3.5, wood cellulose fiber mulch shall be applied at the rate of 1,500 pounds per acre in a mixture of seed and fertilizer. Hydraulic equipment shall be used for the application of fertilizer, seed, and slurry of the prepared wood pulp. This equipment shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry of the specified amount of fiber, fertilizer, seed, and water. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles that will provide even

distribution of the slurry on the various areas to be seeded. The slurry tank shall have a minimum capacity of 1,000 gallons.

The seed, fertilizer, wood pulp mulch and water shall all be combined into the slurry tank for distribution of all ingredients in one operation by the hydraulic seeding method specified herein. The materials shall be combined in a manner recommended by the manufacturer. The slurry mixture shall be so regulated that the amounts and rates of application shall result in a uniform application of all materials at rates not less than the amounts specified. Using the color of the wood pulp as a guide, the equipment operator shall spray the prepared seedbed with a uniform visible coat. The slurry shall be applied in a sweeping motion, in an arched stream, so as to fall like rain, allowing the wood fibers to build upon each other until an even coat is achieved.

Method C. Seeding (Excelsior Mulch). Seed shall be sown as specified in Paragraphs one and two of Subsection 32 92 00 3.5. Within 25 hours after the covering of seed, excelsior mulch shall be uniformly applied at the rate of 2 tons per acre. The mulch may be applied hydraulically or by other approved methods. Should the mulch be placed in a dry condition, it shall be thoroughly wetted immediately after placing. The Engineer may require light rolling of the mulch to form a tight mat.

3.7 Protection of Structures. Before spraying emulsified asphalt, the Contractor shall cover any parts of bridges, culverts, guardrail, signs, sidewalk, curb and gutter, catch basins, pipe ends and other structures as necessary to prevent discoloration.

3.8 Second Application of Fertilizer. After the plants have become established, fertilizer shall be applied on permanent vegetation uniformly in dry form at the rate of 500 pounds per acre on the areas designated by the Engineer. Fertilizer may, at the discretion of the Engineer, upon receipt of satisfactory evidence of its feasibility from the manufacturer, be applied in liquid form. Unless otherwise provided, temporary vegetation will not receive a second application of fertilizer. When two different types of fertilizer are set up in the proposal, the fertilizer with the less nitrogen content shall be applied to the areas where sericea lespedeza predominates.

3.9 Application of Nitrogen. As soon as the plants show satisfactory growth, actual nitrogen shall be applied evenly at the rate of 48 pounds per acre on the areas designated by the Engineer. Unless otherwise permitted, the nitrogen shall be applied in a solid form rather than in a liquid state. Nitrogen shall not be applied to stands of serice a lespedeza. Unless otherwise provided, nitrogen will not be applied to temporary vegetation.

3.10 Maintenance. The Contractor will be required to do all maintenance necessary to keep seeded areas in a satisfactory condition until the work is finally accepted. This includes mowing and repairing washes, and additional seed, fertilizer and mulch applied to areas where a satisfactory stand of grass has not been achieved.

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