100% CONSTRUCTION DOCUMENT SUBMITTAL
PROJECT MANUAL
for the

ST. JOHN THE BAPTIST PARISH
EDGARD LIBRARY ADDITION/RENOVATION
2979 Highway18, Edgard, LA 70049

Owner:

ST. JOHN the BAPTIST PARISH
NATALIE ROBOTTOM, PARISH PRESIDENT

ST. JOHN the BAPTIST PARISH LIBRARY
NATALIE D. BEAM, DIRECTOR

Prepared by:

ARCHITECT:
SIZELER THOMPSON BROWN ARCHITECTS
REGIONAL DESIGN GROUP, LLC
300 LAFAYETTE STREET, SUITE 200
NEW ORLEANS, LOUISIANA 70130
Tel: (504) 523-6472 Fax: (504) 529-1181

Consultants:

STRUCTURAL & CIVIL ENGINEERS:
SCHRENK ENDOM & FLANAGAN
4227 Bienville Street
New Orleans, LA 70119
Tel: 504.482.7856

MECHANICAL & ELECTRICAL ENGINEERS:
HUSEMAN AND ASSOCIATES
3925 N. Interstate 10 Service Road
Suite 201-B
Metairie, LA 70002
Tel: 504.456.3119

ARCHITECT'S PROJECT No:
21205.00

RE-BID FEBRUARY 5, 2016

~~**DECEMBER 11, 2015**~~

Set No. _____

INTRODUCTORY INFORMATION

Sizeler Thompson Brown Architects
300 Lafayette Street, Suite 200
New Orleans, LA 70130
Phone: 504-523-6472
Fax: 504-529-1181

www.sizelerthompsonbrown.com

DOCUMENT 00 0103

PROJECT DIRECTORY

OWNER:	ST. JOHN THE BAPTIST PARISH EDGARD LIBRARY ADDITION/RENOVATION EDGARD, LA 70049
ARCHITECT:	SIZELER THOMPSON BROWN ARCHITECTS 300 LAFAYETTE STREET, SUITE 200 NEW ORLEANS, LA 70130 Tel: (504) 523-6472 Fax: (504) 529-1181 Principal-in-Charge: Thomas Brown Project Manager: Brian Beadle
STRUCTURAL and CIVIL ENGINEER:	SCHRENK ENDOM & FLANAGAN 4227 BIENVILLE AVENUE NEW ORLEANS, LA 70119 Tel: (504) 482-7856 Fax: (504) 482-7325
MECHANICAL and ELECTRICAL ENGINEER:	HUSEMAN AND ASSOCIATES 3925 N. INTERSTATE 10 SERVICE ROAD, SUITE 201-B METAIRIE, LA 70002 Tel: (504) 456-3119 Fax: (504) 456-3122

END OF DOCUMENT

DOCUMENT 00 0107
PROFESSIONAL SEALS

PROJECT NAME: **ST. JOHN THE BAPTIST PARISH**
EDGARD LIBRARY ADDITION/RENOVATION

2979 Highway 18
Edgard, Louisiana 70049

DATE: **December 11, 2015**

ARCHITECTURAL SPECIFICATIONS: The following specification Sections were prepared by me or under my direct personal supervision:

Sizeler Thompson Brown Architects

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STRUCTURAL AND CIVIL SPECIFICATIONS: The following specification Sections were prepared by me or under my direct personal supervision:

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Huseman and Associates

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Huseman and Associates

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BIDDING REQUIREMENTS

Sizeler Thompson Brown Architects
300 Lafayette Street, Suite 200
New Orleans, LA 70130
Phone: 504-523-6472
Fax: 504-529-1181

www.sizelerthompsonbrown.com

DOCUMENT 00 1113

ADVERTISEMENT FOR BIDS

A. Advertisement for Bids: The Advertisement for Bids to be used for this Project shall be as provided by the Parish of St. John the Baptist and is bound in the Project Manual following this page.

END OF DOCUMENT

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DOCUMENT 00 1113

ADVERTISEMENT FOR BIDS

St. John the Baptist Parish Library Board (herein referred to as the "Owner")

Sealed bids shall be received by the Owner for the construction of the project described as follows:

St. John the Baptist Parish
Edgard Library Addition/Renovation
2979 Hwy. 18
Edgard, Louisiana 70049

Bids shall be addressed to the St. John the Baptist Parish Library Board and delivered to the receptionist at the **Parish President's Office in the Percy Hebert Building, 1801 West Airline Highway, LaPlace, LA** not later than **2:45 o'clock P. M.** on **Tuesday, March 8, 2016.**

Sealed Bid envelope shall be marked "Sealed Bid – St. John the Baptist Parish Edgard Library Addition/Renovation, 2979 Hwy. 18, Edgard, LA, with bidding contractor's legal company name." In addition to hard copies, bidders must submit an electronic copy (Compact disc or USB flash drive) within 10 calendar days of the bid opening. Any bids received after the specified time and date will not be considered. The sealed bids will be publicly opened and read aloud at 3:00 o'clock P. M., March 8, 2016 in the St. John the Baptist Parish Joel S. McTopy Council Chambers located at 1801 West Airline Hwy. in LaPlace, LA.

The Information for Bidders, Bid Proposal, Plans, Specifications are to be obtained through the Office of **Sizeler Thompson Brown Architects, 300 Lafayette St., Suite 200, New Orleans, LA 70130 (504) 523-6472.** Copies may be obtained through that office upon payment of **$150.00** which constitutes the cost of reproduction and handling and is non-refundable.

Complete Bidding Documents are also available in electronic format. They may be obtained without charge and without deposit from the public plan room at www.e-arc.com. Details may be viewed and electronic bids are being accepted at www.centralbidding.com. All Bid Documents and Specifications may also be viewed at the Parish website, www.sjbparish.com.

The Owner reserves the right to accept or reject any and all bids and to waive any irregularities or informalities incidental thereto, and to accept any bid, which the Owner feels, serves their best interest. Such action will be in accordance with Title 38 of the Louisiana Revised Statutes.

Each Bidder must deposit with his/her bid, security in the amount equal to five percent (5%) of the total bid in the form of a certified check, cashier's check or bid bond.

All bidders must show proof that he/she is licensed in the State of Louisiana to perform this type of construction.

Contractors bidding this work must possess a current Louisiana **Building Construction** License in accordance with LA-R.S. 37:2150 through 37:2163, as amended, and be in good standing with the State and the Parish.

Contractor's license number must appear on the face of the sealed envelope containing the bid.

St. John the Baptist Parish Library Board, being a government agency, is exempt from all sales tax. The vendor awarded the contract will be provided documentation to support their tax free purchases for this project. Therefore, ***the amount you bid should contain no sales tax****.*

The successful bidder will be required to furnish a Performance and Payment Bond written by a company licensed to do business in Louisiana, in the amount equal to one hundred percent (100%) of the contract price. Certificates of Insurance will also be required as specified in the bid package.

A non-mandatory pre-bid meeting will be held on Thursday, February 25, 2016 at 10:00 AM in the Joel S. McTopy Council Chambers located at 1801 West Airline Hwy. in LaPlace, LA.

No bidder may withdraw his/her bid within forty-five (45) days after the actual date of opening thereof.
The Contractor shall begin mobilization and procurement of necessary materials within ten (10) working days of the receipt of the Notice to Proceed.

Any person with disabilities requiring Special Accommodation must contact the St. John the Baptist Parish Council Office at (985) 652-9569 no later than seven (7) days prior to bid opening.

Participation by minority and female-owned businesses, as well as businesses located in this Parish, is encouraged.

ST. JOHN THE BAPTIST PARISH LIBRARY BOARD

Publish dates will be:
Wednesday, February 10, 2016
Wednesday, February 17, 2016 and
Wednesday, February 24, 2016
Location: L'Observateur.

END OF DOCUMENT

DOCUMENT 00 2113

INSTRUCTIONS TO BIDDERS

A. Instruction to Bidders: The Instructions to Bidders to be used for this Contract for Construction shall be **A.I.A. Document A701, Instructions to Bidders - 1997 Edition** and are bound in the Project Manual following this page.

B. Supplementary Instructions to Bidders: The instructions to Bidders for this Contract are modified, amended and supplemented directly into the A.I.A. document.

END OF DOCUMENT

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AIA® Document A701™ – 1997

Instructions to Bidders

for the following PROJECT:
(Name and location or address)

Roland Borne Memorial Library Expansion
St. John the Baptist Parish
2979 LA Highway 18
Edgard, LA 70049

A renovation and addition to the existing Roland Borne Memorial Library located in Edgard, Louisiana

THE OWNER:
(Name, legal status and address)

St. John the Baptist Parish Library Board
2920 Highway 51
LaPlace, LA 70068

THE ARCHITECT:
(Name, legal status and address)

Sizeler Thompson Brown Architects
Regional Design Group, LLC
300 Lafayette Street, Suite 200
New Orleans, LA 70130

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

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

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8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

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User Notes: (877871945)

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 other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

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

§ 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 as the base, to which Work may be added or from which Work may be deleted for 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 the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

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

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

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

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 COPIES

§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded. For clarification, the term "good condition" throughout this document shall mean:

1. Complete Drawings, Project Manual, and all Addenda issued prior to the return of the Documents.

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User Notes: (877871945)

2. All documents listed above shall be bound as originally issued.

3. All documents listed above shall be free from permanent marks including, but not limited to, permanent ink and highlight markers.

§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

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

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

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

§ 3.3 SUBSTITUTIONS

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

§ 3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least seven (7) working days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. 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. 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.

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

§ 3.3.4 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 all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

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§ 3.4.3 Addenda will be issued no later than 72 hours not including weekends and holidays prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

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

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

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

§ 4.1.1.1 Contractor shall be licensed in the State of Louisiana at the time of the submission of the Bid. Contractors shall include their license number on the bid envelope in accordance with LA R.S 37:2163A.

§ 4.1.1.2 Contractor shall refer to Specification Section 00 3119 – "Existing Condition Information" and the contents of Appendix C of this Specification in determining the Bid.

§ 4.1.1.3 Bids shall include the following items:

Louisiana Uniform Public Work Bid Form
Bid Bond
Corporate Resolution (Document 00 4543)
Evidence of Agency, Corporate, or Partnership Authority (Document 00 4510)

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

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

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

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

§ 4.1.7.1 Bid security shall be not less than five (5%) percent of the amount of the bid. Bid Security shall be submitted on the bid bond document included.

§ 4.2 BID SECURITY

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, 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. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, 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 the power of attorney.

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§ 4.2.3 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 bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

§ 4.3 SUBMISSION OF BIDS

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

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

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

§ 4.3.4 Oral, telephonic, telegraphic or facsimile bids will not be considered.

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid. In accordance with LA R.S. 38:2214 (C) & (D), bids may only be withdrawn after the bid opening if there are obvious, unintentional, and substantial mechanical, clerical, or mathematical errors. A withdrawn bid may not be resubmitted.

§ 4.5 DOCUMENTS REQUIRED AFTER BID

§ 4.5.1 Document 00 4520 - Corporate Resolution shall be signed, notarized and provided ten (10) days after bid due date. Document Attestation shall be signed by all bidders and provided within ten (10) days after bid due date.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 OPENING OF BIDS

At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

§ 5.2 REJECTION OF BIDS

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.

§ 5.2.1 The Owner has the right to reject any and all bids for just cause in accordance with LA R.S. 38:2214B.

§ 5.3 ACCEPTANCE OF BID (AWARD)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid

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which, in the Owner's judgment, is in the Owner's own best interests. Requirements set forth in the Advertisement for Bids and the Bid Form may NOT be waived as informalities.

§ 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 low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

§ 6.2 OWNER'S FINANCIAL CAPABILITY

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

§ 6.3 SUBMITTALS

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

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

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

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

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

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. Bonds may be secured through the Bidder's usual sources.

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

§ 7.1.3 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

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§ 7.2 TIME OF DELIVERY AND FORM OF BONDS

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner on the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

§ 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 thereto a certified and current copy of the power of attorney.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

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DOCUMENT 00 2119

!!!CAUTION TO BIDDERS!!!

BEFORE SIGNING AND SUBMITTING THIS BID, PLEASE REFER TO **"DOCUMENT 00 4393 - BIDDER'S CHECKLIST"** IN THIS PROJECT MANUAL.

FAILURE TO PERFORM ANY ONE OF THE ACTIONS LISTED ON THE "BIDDER'S CHECKLIST" MAY CAUSE YOUR BID TO BE REJECTED!!!

END OF DOCUMENT

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SECTION 00 3119
EXISTING CONDITION INFORMATION

PART 1 GENERAL

1.1 EXISTING CONDITION INFORMATION

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

B. Existing drawings that include information on existing conditions including previous construction at Project site are available for viewing at the office of Architect.

C. Existing specifications that include information on existing conditions including previous construction at Project site are available for viewing at the office of Architect.

D. Notifications, determinations, protocols, and direction given by authorities having jurisdiction. **These notifications and associated correspondence can be found in Appendix C of this specification.**
   1. The documents contained may have bearing on the Work and may impact the following:
      a. Project Schedule.
      b. Contractor's Means and Methods.

IT IS IMPORTANT THAT ALL BIDDERS ARE FAMILAR WITH ANY DOCUMENTATION INCLUDED AND ARE PREPARED TO EXECUTE THE WORK IN CONSIDERATION OF THE CONTENTS OF EACH DOCUMENT

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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DOCUMENT 00 3132

GEOTECHNICAL DATA

A. **Geotechnical Investigation**: A Geotechnical Investigation was made at the project site by Eustis Engineering Company, Inc., Metairie, LA 70002; phone: 504-834-0157, dated August 21, 1998. Neither the Owner, nor the Architect, nor the Engineer guarantees the accuracy of the soils information.

1. **Data indicating subsurface conditions** are not intended as representations or warrants of continuity of such conditions between soil borings. The Owner, Architect and Engineer will not be responsible for interpretations or conclusions drawn there from by the Contractor. Data is made available for the convenience of the Contractor.
2. **Additional test borings** and other exploratory operations may be made by the Contractor at no additional cost to the Owner, provided they are acceptable to the Owner and the Architect.
3. **The above-referenced** geotechnical report is provided for the Bidder's use in preparing Bids and does not relieve the Bidders from doing their own investigation to determine the accuracy of the information.
4. **This investigative report** may be found in Appendix A at the end of the project specifications.
5. **THIS REPORT IS NOT PART OF THE CONTRACT DOCUMENTS.**

END OF DOCUMENT

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DOCUMENT 00 4113

BID FORM

A. Bid Form: The Bid Form(s) to be used for this Contract for this Contract for Construction shall be provided by the Parish of St. John the Baptist and are bound in this Project Manual following this page.

END OF DOCUMENT

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LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: St. John the Baptist Parish
Department of Purchasing/Procurement
1801 W. Airline Hwy.
LaPlace, LA 70068

BID FOR: St. John the Baptist Parish
Edgard Library Addition/Renovation
Edgard, LA
Project No: STBA #21205.00

The undersigned bidder hereby declares and represents that she/he; a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by:_____ _____ and dated: _____

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following **ADDENDA:** (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging) _____.

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated "Base Bid" * but not alternates) the sum of:

_____Dollars ($ _____)

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.

Alternate No. 1 – CLEANING AND REPAINTING OF EXISTING METAL ROOF PANEL SYSTEM for the lump sum of:

_____Dollars ($ _____)

Alternate No. 2 - NEW ENTRY CANOPY for the lump sum of:

_____Dollars ($ _____)

Alternate No. 3 - NOT APPLICABLE for the lump sum of:

NOT APPLICABLE Dollars ($ NOT APPLICABLE)

NAME OF BIDDER: _____

ADDRESS OF BIDDER:_____

_____

LOUISIANA CONTRACTOR'S LICENSE NUMBER: _____

NAME OF AUTHORIZED SIGNATORY OF BIDDER: _____

TITLE OF AUTHORIZED SIGNATORY OF BIDDER: _____

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER **: _____

DATE: _____

* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.

** If someone other than a corporate officer signs for the Bidder/Contractor, a copy of a corporate resolution or other signature authorization shall be required for submission of bid. Failure to include a copy of the appropriate signature authorization, if required, may result in the rejection of the bid unless bidder has complied with La. R.S. 38:2212(A)(1)(c) or RS 38:2212(O) .

BID SECURITY in the form of a bid bond, certified check or cashier's check as prescribed by LA RS 38:2218.A is attached to and made a part of this bid.

LOUISIANA UNIFORM PUBLIC WORK BID FORM

UNIT PRICE FORM

TO: St. John the Baptist Parish
Department of Purchasing/Procurement
1801 W. Airline Hwy.
LaPlace, LA 70068

BID FOR: St. John the Baptist Parish
Edgard Library Addition/Renovation
Edgard, LA
Project No: STBA #21205.00

UNIT PRICES: This form shall be used for any and all work required by the Bidding Documents and described as unit prices. Amounts shall be stated in figures and only in figures.

DESCRIPTION:	☑Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

DESCRIPTION:	❑ Base Bid or ❑ Alt.# ___			
REF. NO.	QUANTITY:	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION *(Quantity times Unit Price)*

Wording for "DESCRIPTION" is to be provided by the Owner.
All quantities are estimated. The contractor will be paid based upon actual quantities as verified by the Owner

BID BOND
FOR
ST. JOHN THE BAPTIST PARISH PROJECTS

Date: _____

KNOW ALL MEN BY THESE PRESENTS:

That_____of_____, as Principal, and_____, as Surety, are held and firmly bound unto the Parish of St. John the Baptist, Department of Purchasing/Procurement (Obligee), in the full and just sum of five (5%) percent of the total amount of this proposal, including all alternates, lawful money of the United States, for payment of which sum, well and truly be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents.

Surety represents that it is listed on the current U. S. Department of the Treasury Financial Management Service list of approved bonding companies as approved for an amount equal to or greater that the amount for which it obligates itself in this instrument or that it is a Louisiana domiciled insurance company with at least an A - rating in the latest printing of the A. M. Best's Key Rating Guide. If surety qualifies by virtue of its Best's listing, the Bond amount may not exceed ten percent of policyholders' surplus as shown in the latest A. M. Best's Key Rating Guide.

Surety further represents that it is licensed to do business in the State of Louisiana and that this Bond is signed by surety's agent or attorney-in-fact. This Bid Bond is accompanied by appropriate power of attorney.

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas said Principal is herewith submitting its proposal to the Obligee on a Contract for:

_____

NOW, THEREFORE, if the said Contract be awarded to the Principal and the Principal shall, within such time as may be specified, enter into the Contract in writing and give a good and sufficient bond to secure the performance of the terms and conditions of the Contract with surety acceptable to the Obligee, then this obligation shall be void; otherwise this obligation shall become due and payable.

_____	_____
PRINCIPAL (BIDDER)	SURETY
BY: _____	BY:_____
AUTHORIZED OFFICER-OWNER-PARTNER	AGENT OR ATTORNEY-IN-FACT(SEAL)

SECTION 00 4393

BID SUBMITTAL CHECKLIST

NOTE: FAILURE TO PERFORM ANY ONE OF THE ACTIONS LISTED ON THIS CHECKLIST MAY CAUSE BID TO BE REJECTED AS UNRESPONSIVE.

- ❑ Enclose Bid Security of not less than 5% of total Bid in the form of certified check, cashiers check, or bid bond. Bid bond must have attached appropriate and satisfactory power of attorney and be in compliance with LSA R.S 38:2218. Enclose **"Bid Bond"** in Bid envelope.

- ❑ Attach satisfactory evidence of authority of person signing on behalf of the individual, firm, partnership, or corporation. Enclose **"Document 00 4510 - Evidence of Agency, Corporate, or Partnership Authority"** in Bid envelope.

- ❑ If BIDDER is a corporation, evidence of authority must be in the form of a Corporate Resolution. Enclose **"Document 00 4543 - Corporate Resolution"** in Bid envelope.

- ❑ Enclose **"Document 00 4519 – Non-collusion Affidavit"**, signed, notarized and provided 10 days after the bid due date.

- ❑ Enclose "Attestations", signed and provided 10 days after the bid due date.

- ❑ Your bid must be submitted as duplicate originals in an opaque envelope. Any discrepancies between the duplicate originals will cause your Bid to be rejected.

- ❑ Your Louisiana State Contractor's License number must be shown on outside of Bid envelope and on the Bid Form.

- ❑ Bidder's name, return address, sealed bid proposal number and the Project name must appear on outside of Bid envelope.

- ❑ Check terms, delivery, starting, and completion times.

END OF SECTION

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DOCUMENT 00 4510

EVIDENCE OF AGENCY, CORPORATE, OR PARTNERSHIP AUTHORITY

A. **Evidence of Agency, Corporate, or Partnership Authority:** The Evidence of Agency, Corporate, or Partnership Authority document to be used for this Contract for Construction shall be provided by the Parish of St. John the Baptist and is bound in this Project Manual following this page.

END OF DOCUMENT

This page is blank.

EVIDENCE OF AGENCY, CORPORATE, OR PARTNERSHIP AUTHORITY

IMPORTANT NOTICE TO ALL BIDDERS

Current and original evidence of Agency, Corporate, or Partnership Authority is required for submission of a bid to the Parish of St. John the Baptist. Each Bidder must complete the following and submit along with bid.

FAILURE TO COMPLY WILL RESULT IN REJECTION OF YOUR BID.

The Bidder is:
1. Sole Proprietorship
2. Corporation
3. Partnership
4. Other, please specify _____

If you are a sole proprietorship the signature on the bid must be that of the Owner or the Owner must provide evidence of agency authorizing person to sign bid and obligate Owner.

If Bidder is a corporation, partnership or other legal entity bidder must comply with LSA-R.S. 38:2212.O.

LSA R.S. 38:2212.O reads as follows:
Whenever evidence of agency, corporate, or partnership authority is required for submission of a bid to a public entity, such fact shall be contained in the bid documents and such proof shall be provided in accordance with the provisions of this Section. The authority of the signature of the person submitting the bid shall be deemed sufficient and acceptable if any of the following conditions are met:

(1) The signature on the bid is that of any corporate officer listed on the most current annual report on file with the Secretary of State, or the signature on the bid is that of any member of a partnership or partnership in commendam listed in the most current partnership records on file with the Secretary of State.

(2) The signature on the bid is that of an authorized representative of the corporation, partnership, or other legal entity and the bid is accompanied by a corporate resolution, certification as to the corporate principal, or other documents indicating authority which are acceptable to the public entity.

(3) The corporation, partnership, or other legal entity has filed in the appropriate records of the Secretary of State or the Clerk of Court for the Parish in which the public entity is located, an affidavit, resolution or other acknowledged or authentic document indicating the names of all parties authorized to submit bids for public contracts. Such document on file with the Secretary of State or the Clerk of Court shall remain in effect and shall be binding upon the principal until specifically rescinded and canceled from the records of the respective offices.

I have read and do understand the above.

_____
(Signature of Bidder)

DOCUMENT 00 4519

NON-COLLUSION AFFIDAVIT

A. Non-Collusion Affidavit: The Non-Collusion Affidavit document to be used for this Contract for Construction shall be provided by the Parish of St. John the Baptist and is bound in this Project Manual following this page.

END OF DOCUMENT

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NON-COLLUSION AFFIDAVIT

STATE OF LOUISIANA
ST JOHN THE BAPTIST PARISH

BEFORE ME, the undersigned authority, personally came and appeared_____

_____ ,who after being by me duly sworn,

deposed and said that he is the fully authorized _____

of _____

(hereinafter referred to as Bidder) the party who submitted a bid to perform all work for construction of the **ST. JOHN THE BAPTIST PARISH, EDGARD LIBRARY ADDITION/RENOVATION, 2979 Highway 18, Edgard, Louisiana**, **70049**, which Bid was received by St. John the Baptist Parish on _____, 20_____ and said affiant further said:

(1) That Bidder employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the Bidder whose services in connection with the construction of the public building or project or in securing the public contract were in the regular course of their duties for Bidder; and
(2) That no part of the contract price received by Bidder was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the Bidder whose services in connection with the construction of the public building or project were in the regular course of their duties for Bidder.
(3) Said bid is genuine and Bidder has not colluded, conspired or agreed directly or indirectly with any other Bidder to offer sham or collusive bid.
(4) Said Bidder has not in any manner directly or indirectly agreed with any other person to fix the bid price of affiant or any other Bidder, or to fix any overhead, profit or cost element of said bid price, or that of any other Bidder, or to induce any other person to refrain from bidding.
(5) Said Bidder is not intended to secure and unfair advantage or benefit from the Parish of Jefferson or in favor of any person interested in the proposed contract.
(6) All statements contained in said bid are true and correct.
(7) Neither affiant nor any member of his company has divulged information regarding said bid or any data relative thereto to any other person, firm or corporation.

_____

SWORN TO AND SUBSCRIBED BEFORE ME

THIS _____ DAY OF _____ 20____

_____
(Notary Public)

DOCUMENT 00 4529

INSURANCE REQUIREMENTS

A. Insurance Requirements: The Insurance Requirements to be provided by the Contractor during the total term of Contract shall be as required by the Parish of St. John the Baptish and are as bound in the Project Manual following this page.

END OF DOCUMENT

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INSURANCE REQUIREMENTS

St. John the Baptist Parish Council

1801 West Airline Highway LaPlace, LA 70068

Contractor shall obtain, pay for and keep in force, at its own expense, minimum insurance effective in all localities where contractor may perform the work hereunder, with such carriers as shall be acceptable to Council:

A. **Statutory Workman's Compensation** covering all state and local requirements and Employer's Liability Insurance covering all persons employed by Contractor in connection with this agreement.

The limits for "A" above shall be not less than:

1. Employers liability limits of $1,000,000/$1,000,000/$1,000,000
2. Some contracts may require USL&H or maritime coverage. This should be checked out with Insurance Dept. /Legal Dept.
3. No excluded classes of owners/officers or employees shall be allowed on Council's premises

WAIVER OF SUBROGATION in favor of St. John the Baptist Parish Council shall be indicated on certificate

B. **Commercial General Liability**, including:

1. Contractual liability assumed by this agreement
2. Owners and Contractor's Protective Liability (if Contractor is a General Contractor) may be required
3. Personal and advertising liability
4. Completed operations
5. Medical payments

The limits for "B" above shall not be less than:

1. $1,000,000 each occurrence limit
2. $2,000,000 general aggregate limit
3. $1,000,000 products/completed operations aggregate limit
4. $1,000,000 personal and advertising injury limit
5. $50,000 fire damage limit
6. $5,000 medical expense limit (desirable but not mandatory)

St. John the Baptist Parish Council will be NAMED as additional insured and WAIVER OF SUBROGATION in favor of St. John the Baptist Parish Council shall be indicated on certificate. Some contracts may require Protection and Indemnity coverage. This should be checked out with Insurance Dept. /Legal Dept.

C. **Comprehensive Automobile Liability** covering all owned, hired and other non-owned vehicles of the Contractor.

The limits for "C" above shall not be less than:

1. $1,000,000 CSL

St. John the Baptist Parish Council will be NAMED as additional insured and WAIVER OF SUBROGATION in favor of St. John the Baptist Parish Council shall be included on certificate.

D. **Professional Liability Insurance** covering the Wrongful Acts of those professional firms and individuals performing services for SJBP.
Certain classifications of service providers will be required to provide evidence of Professional Liability Insurance. Examples of these providers include but are not limited to: Professional Engineers, Architects, Land Surveyors, Attorneys, and IT Consultants.
The limits for "D" above shall not be less than:
1. $1,000,000 CSL

WAIVER OF SUBROGATION in favor of St. John the Baptist Parish Council shall be included on the Certificate.

OTHER SPECIFIC COVERAGE RELATED TO THE TASK BEING PERFORMED MAY BE REQUIRED, i.e. Builders Risk, Installation Floater.

All required insurance certificates shall be submitted to the Director of Purchasing & Procurement prior to commencement of work. Vendor shall maintain insurance in full force and effect during the entire period of performance of work. All policies must have a thirty (30) day non-cancellation clause giving the Parish thirty (30) days prior written notice in the event a policy is changed or canceled.

CERTIFICATES

A W-9 form is to be furnished prior to work being issued.

When applicable, a current St. John the Baptist Parish Occupational License is to be maintained. Yearly, a copy of such license shall be provided to the Director of Purchasing

WHEN APPLICABLE, A CURRENT LOUISIANA STATE CONTRACTOR'S LICENSE SHOULD BE FURNISHED.

DOCUMENT 00 4543

CORPORATE RESOLUTION

A. Corporate Resolution: The Corporate Resolution Form to be used for this Contract for Construction shall be as provided by the Parish of St. John the Baptist and is bound in the Project Manual following this page.

END OF DOCUMENT

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CORPORATE RESOLUTION

EXCERPT FROM MINUTES OF THE BOARD OF DIRECTORS OF _____ _____ ,INCORPORATED. At the meeting of directors of _____ , Incorporated, duly noticed and held on _____ 20 _____ , a quorum being there present, on motion duly made and seconded. It was:

RESOLVED. That _____ , be and is hereby appointed, constituted and designated as agent and attorney-in-fact of the Corporation with full power and authority to act on behalf of this Corporation in all negotiations, bidding, concerns and transactions with **St. John the Baptist Parish Library System** or any of its agencies, departments, employees or agents, including but not limited to, the execution of all bids, papers, documents, affidavits, bonds, sureties, contracts and acts and to receive and receipt therefore all purchase orders and notices issued pursuant to the provisions of any such bid or contract, this Corporation hereby ratifying, approving, confirming and accepting each and every such act performed by the said agent and attorney-in-fact.

I hereby certify the foregoing to be a true and correct copy of an excerpt of the minutes of the above dated meeting of the Board of Directors of said Corporation, and the same has not been revoked or rescinded.

_____

(Secretary-treasurer)

_____20 _____

(Date)

(This form or other document which establishes Evidence of Agency in accordance with LA R.S. 38:2212 et seq. shall be included in Bid Envelope)

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DOCUMENT 00 4549

ATTESTATIONS AFFIDAVITS

A. Attestations Affidavits: The Attestations Affidavits to be used for this Contract for Construction shall be as provided by the Parish of St. John the Baptist and are bound in this Project Manual following this page.

END OF DOCUMENT

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Hold Harmless

To the fullest extent permitted by law, Company/Consultant shall indemnify, hold harmless, and defend the Parish Council and all of its Agents and Employees, from and against all claims, damages, losses and expenses, including but not limited to attorney's 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 only to the extent caused in whole or in part by negligent acts or omissions of Company.

Non-assignability

No Company/Consultant shall assign any interest in this contract by assignment, transfer, or novation, without prior written consent of the Parish. This provision shall not be construed to prohibit the contractor from assigning his bank, trust company, or other financial institution any money due or to become due from approved contracts without such prior written consent. Notice of any such assignment or transfer shall be furnished promptly to the Parish.

Exclusions

Pursuant to Louisiana Revised Statute 38:2227, Company must certify that he has not been convicted of, or has not entered into a plea of guilty or nolo contendere to public bribery, corrupt influencing, extortion, money laundering or their equivalent Federal crimes. Consultant must further certify that he has not been convicted of, or has not entered into a plea of guilty or nolo contendere to theft, identify theft, theft of a business record, false accounting, issuing worthless checks, bank fraud, forgery, contractors' misapplication of payments, malfeasance in office, or their equivalent Federal crimes within the five (5) years prior to submitting the proposal.

Disclosure

Company/Consultant must disclose whether it provides services or pays commissions to any employee or elected official of St. John the Baptist Parish. If so, company must disclose to whom services are provided and/or commissions are paid. Both positive and negative responses must be submitted.

E-Verify Program

Pursuant to Louisiana Revised Statute 38:2212.10, contractor must certify that it and each individual, firm or corporation associated with it and engaged in the physical performance of services in the State of Louisiana, under a contract with St. John the Baptist Parish has registered with, is participating in, and shall continue to participate in a federal work authorization program designated as such under the Illegal Immigration Reform and Immigrant Responsibility Act of 1996, as amended, which is operated by the United States Department of Homeland Security, known as the "E-Verify" program. Contractor must verify the legal status of all existing and new employees in the State of Louisiana by attesting herein that each is a citizen of the United States or legal aliens as defined by now effective immigration laws of the United States of America.

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E-VERIFY AFFIDAVIT

STATE OF LOUISIANA

PARISH OF _____

BEFORE ME, the undersigned Notary Public PERSONALLY CAME AND APPEARED,

I, _____, the owner/authorized representative of

_____
Company/Individual/Legal Entity Name

who hereby personally and as the authorized representative of the above identified legal person executes this affidavit, as the undersigned Contractor verification of its current and future compliance with L.S.A. R.S. 38:2212.10, stating affirmatively that it and each individual, firm or corporation associated with it and engaged in the physical performance of services in the State of Louisiana, under a contract with St. John the Baptist Parish has registered with, is participating in, and shall continue to participate in a federal work authorization program designated as such under the Illegal Immigration Reform and Immigrant Responsibility Act of 1996, as amended, which is operated by the United States Department of Homeland Security, known as the "E-Verify" program. The Contractor hereby verifies the legal status of all existing and new employees in the State of Louisiana by attesting herein that each is a citizen of the United States or legal aliens as defined by now effective immigration laws of the United States of America.

Contractor shall not assign this Contract or any monies due or to become due hereunder, or subcontract any part of the Work without the prior written consent of St. John the Baptist Parish.

Contractor verifies that Contractor will collect an affidavit in this form from any approved subcontractor and forward a copy to: St. John the Baptist Parish, 1801 West Airline Hwy, LaPlace, Louisiana 70068, no later than five business days of contracting with its subcontractor; however, in no instance shall the affidavit be received after commencement of work by the subcontractor.

_____
Signature of Authorized Signatory

_____
Date E-Verify ID Assigned

_____
Printed Name of Signatory

_____
E-Verify ID

_____
Title of Authorized Signatory

SUBSCRIBED AND SWORN BEFORE ME ON THIS THE DAY OF_____ , 20_____

_____
Notary Signature

Printed Notary Name: _____

Notary/Bar Roll Number: _____

My Commission is For/Expires: _____

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PAST CRIMINAL CONVICTIONS OF BIDDERS ATTESTATION (LA. R.S. 38:2227)

STATE OF LOUISIANA

PARISH OF _____

BEFORE ME, the undersigned Notary Public PERSONALLY CAME AND APPEARED,

I, _____, (Appearer) the owner/authorized representative of

_____
Company / Individual / Legal Entity Name

Appearer, as a Bidder on the herein named Project, does hereby attest that:

A. No sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named herein, including any silent or dormant owner or manager, has been convicted of, or has entered a plea of guilty or nolo contendere to, any of the following state crimes or equivalent federal crimes:

(a) Public bribery (R.S. 14:118)
(b) Corrupt influencing (R.S. 14:120)
(c) Extortion (R.S. 14:66)
(d) Money laundering (R.S. 14:230)

B. For five years prior to the project bid date, no sole proprietor or individual partner, incorporator, director, manager, officer, organizer, or member who has a minimum of a ten percent (10%) ownership in the bidding entity named herein, including any silent or dormant owner or manager, has been convicted of, or has entered a plea of guilty or nolo contendere to any of the following state crimes or equivalent federal crimes, during the solicitation or execution of a contract or bid awarded pursuant to the provisions of Chapter 10 of Title 38 of the Louisiana Revised Statutes:

(a) Theft (R.S. 14:67)
(b) Identity Theft (R.S. 14:67.16)
(c) Theft of a business record (R.S. 14:67.20)
(d) False accounting (R.S. 14:70)
(e) Contractor's misapplication of payments (R.S. 14:202)
(f) Bank fraud (R.S. 14:71.1)
(g) Forgery (R.S. 14:72)
(h) Issuing worthless checks (R.S.14:71)
(i) Malfeasance in office (R.S. 14:134)

_____
Name of Bidder

_____
Signature of Authorized Signatory of Bidder

_____
Project Name/Number

_____
Title of Authorized Signatory

SUBSCRIBED AND SWORN BEFORE ME ON THIS _____ DAY OF_____, 20_____.

_____
Notary Signature

Printed Notary Name: _____

Notary/Bar Roll Number: _____

My Commission is For/Expires: _____

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SAINT JOHN THE BAPTIST PARISH
NON-SOLICITATION AND UNEMPLOYMENT AFFIDAVIT
(Pursuant to La. R.S. 38:2224 and La. R.S. 23:1726(B))

STATE OF _____

PARISH/COUNTY OF_____

Before me, the undersigned authority, came and appeared,

I, _____, the owner/authorized representative of

_____
Company/Individual/Legal Entity Name

who, being first duly sworn, deposed and state that I personally and as an authorized representative of the above identified legal person executes this continuing affidavit stating that neither the above named Contractor nor a person acting on its behalf, either directly or indirectly, employed, paid, nor promised any gift, consideration or commission to any person or legal entity to procure or assist in procuring this public contract, other than persons regularly employed by Contractor whose services were in the regular course of their duties for Contractor in connection with the construction, alteration or demolition of a public building or project.

The above named Contractor, if awarded, continually affirms that no part of the contract price received by Contractor was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the affiant whose services were in the regular course of their duties for Contractor.

The above named Contractor hereby attests and certifies that it does not have any unpaid assessment or penalty levied against it regarding unemployment compensation and currently does and will continue to properly classify each employee.
Contractor verifies that Contractor will collect an affidavit in this form from any approved subcontractor and forward a copy to: Saint John the Baptist Parish, 1801 West Airline Hwy, LaPlace, Louisiana 70068, no later than five business days after contracting with its subcontractor; however, in no instance shall the affidavit be received after commencement of work by the subcontractor.

_____ Signature of Authorized Signatory _____ Printed Name of Signatory _____ Title of Authorized Signatory _____ Project Name/Number	SUBSCRIBED AND SWORN BEFORE ME ON THIS _____ DAY OF _____2012. _____ Notary Signature Printed Notary Name: _____ Notary/Bar Roll Number: _____ My Commission is for/expires on: _____

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CONTRACTING REQUIREMENTS

Sizeler Thompson Brown Architects
300 Lafayette Street, Suite 200
New Orleans, LA 70130
Phone: 504-523-6472
Fax: 504-529-1181

www.sizelerthompsonbrown.com

DOCUMENT 00 5213

AGREEMENT FORM – STIPULATED SUM

A. **Agreement Form:** The Agreement Form to be used for this Contract for Construction shall be **A.I.A. Document A101, STANDARD FORM of AGREEMENT BETWEEN OWNER AND CONTRACTOR where the basis of payment is a Stipulated Sum – 2007 Edition**, the Architect has provided a copy of the agreement following this page.

END OF DOCUMENT

This page is blank.

AIA® Document A101™ – 2007

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

AGREEMENT made as of the _____ day of _____ in the year Two Thousand Sixteen
(In words, indicate day, month and year)

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

St. John the Baptist Parish Library Board
2920 Highway 51
LaPlace, LA 70068

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

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

Roland Borne Memorial Library Expansion
St. John the Baptist Parish
2979 LA Highway 18
Edgard, LA 70049

A renovation and addition to the existing Roland Borne Memorial Library located in Edgard, Louisiana

The Architect:
(Name, address and other information)

Sizeler Thompson Brown Architects
Regional Design Group, LLC
300 Lafayette Street, Suite 200
New Orleans, LA 70130

The Owner and Contractor agree as follows.

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

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

AIA Document A201™–2007, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.
/

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TABLE OF ARTICLES

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8 MISCELLANEOUS PROVISIONS

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10 INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

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.

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 of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.
(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

If, prior to the commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows:

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

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than Two Hundred Forty (240) days from the date of commencement, or as follows:
(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

Init.

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User Notes: (1311995715)

Portion of Work	Substantial Completion Date

, subject to adjustments of this Contract Time as provided in the Contract Documents.
(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)

The Owner shall assess or the Contractor shall pay to Owner liquidated damages of five hundred dollars ($500.00) per calendar day that Contractor fails to achieve substantial completion in compliance with the Contract Time.

If Contractor/Bidder fails to complete all punch list items within 45 days from the date that the project is certified as substantially complete, the Owner may deduct from the remaining contract balance the sum of seven hundred fifty dollars ($750.00) per calendar day as liquidated damages for each calendar day thereafter until all punch list items are complete.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be _____ ($_____), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:
(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 4.3 Unit prices, if any:
(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price Per Unit

§ 4.4 Allowances included in the Contract Sum, if any:
(Identify allowance and state exclusions, if any, from the allowance price.)

Item	Price

ARTICLE 5 PAYMENTS

§ 5.1 PROGRESS PAYMENTS

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

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

The 26th day of the month to the 25th day of the following month.

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the 26th day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the 10th day of the next month. If an Application for Payment is received by the Architect after the application date fixed above, payment

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shall be made by the Owner not later than Twenty (20) days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, 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 other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

.1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of five percent (5%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™–2007, General Conditions of the Contract for Construction;

.2 Add 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), less retainage of five percent (5%);

.3 Subtract the aggregate of previous payments made by the Owner; and

.4 Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201–2007.

§ 5.1.7 The progress payment amount determined in accordance with Section 5.1.6 shall be further modified under the following circumstances:

.1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and
(Section 9.8.5 of AIA Document A201–2007 requires release of applicable retainage upon Substantial Completion of Work with consent of surety, if any.)

.2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201–2007.

§ 5.1.8 Reduction or limitation of retainage, if any, shall be as follows:
(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.6.1 and 5.1.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

None permitted.

§ 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 Section 12.2.2 of AIA Document A201–2007, 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.

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User Notes: (1311995715)

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

Final payment is conditioned upon complying with the requirements set forth in the General Conditions of the Contract for Construction.

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 INITIAL DECISION MAKER

The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201–2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 BINDING DISPUTE RESOLUTION

For any Claim subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A201–2007, the method of binding dispute resolution shall be as follows:
(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)

[X] Arbitration pursuant to Section 15.4 of AIA Document A201–2007

[ ] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

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 A201–2007.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2007.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

per annum

§ 8.3 The Owner's representative:
(Name, address and other information)

§ 8.4 The Contractor's representative:

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(Name, address and other information)

§ 8.5 Neither the Owner's nor the Contractor's representative shall be changed without ten days written notice to the other party.

§ 8.6 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 9.1.1 The Agreement is this executed AIA Document A101–2007, Standard Form of Agreement Between Owner and Contractor.

§ 9.1.2 The General Conditions are AIA Document A201–2007, General Conditions of the Contract for Construction.

§ 9.1.3 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

§ 9.1.4 The Specifications:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

(Table deleted)
§ 9.1.5 The Drawings:
(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

(Table deleted)
§ 9.1.6 The Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents:

.1 AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

.2 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2007 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract

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Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2007.

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2007.)

Type of insurance or bond	**Limit of liability or bond amount ($ 0.00)**
See General Conditions	See General Conditions

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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DOCUMENT 00 6113

PERFORMANCE BOND AND PAYMENT BOND FORMS

A. **Performance Bond:** The Performance Bond and Payment Bond Forms to be used for this Contract for Construction shall be **A.I.A. Document A312 - PERFORMANCE BOND AND PAYMENT BOND - 2010 Edition** and is available for review at the office of the Architect.

END OF DOCUMENT

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DOCUMENT 00 7200

GENERAL CONDITIONS

A. **General Conditions: A.I.A. Document A201, General Conditions of the Contract for Construction - 2007 Edition,** of the American Institute of Architects, are the General Conditions of this Contract and are bound into this Project Manual following this page.

B. **Contractor's Responsibility:** The Contractor shall acquaint himself with the provisions of the General Conditions and notify all subcontractors, suppliers and other parties, individuals and agencies engaged in the Work as to their contents.

C. **Contractual Adjustments:** No contractual adjustments will be permitted for failure of the Contractor to fully acquaint himself and other interested parties with the conditions of A.I.A. Document A201.

D. **Supplementary Conditions:** The General Conditions of the Contract for Construction are modified, amended and supplemented directly in the document. Deletions are shown as a strikethrough and additions are shown with underline.

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AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

Roland Borne Memorial Library Expansion
St. John the Baptist Parish
2979 LA Highway 18
Edgard, LA 70049

A renovation and addition to the existing Roland Borne Memorial Library located in Edgard, Louisiana

THE OWNER:
(Name and address)

St. John the Baptist Parish Library Board
2920 Highway 51
LaPlace, LA 70068

THE ARCHITECT:
(Name and address)

Sizeler Thompson Brown Architects
Regional Design Group, LLC
300 Lafayette Street, Suite 200
New Orleans, LA 70130

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

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

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract 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, the Contractor's bid or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

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

§ 1.1.6 THE SPECIFICATIONS

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

§ 1.1.7 INSTRUMENTS OF SERVICE

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

(Paragraphs deleted)

§ 1.1.8 THE PROJECT MANUAL

Project Manual is a volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications. The Sections in Division 1 – General Requirements specify detailed administrative and procedural requirements, which are applicable to all elements of the Construction Contract. The following documents are applicable to Division 1 – General Requirements:

.1 Drawings.

.2 Bidding Requirements (will be included as part of the Contract Documents in the Owner/Contractor Agreement).

.3 Owner/Contractor Agreement.

.4 Bonds.

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.5 General Conditions.
.6 Supplementary Conditions.
.7 Specification Divisions 2 through 16

§ 1.1.9 MISCELLANEOUS DEFINITIONS

§ 1.1.9.1 Terms "building code," and "code," refer to regulations of governmental entities having jurisdiction over the Project and the Work.

§ 1.1.9.2 "Acceptable," "required," and "as directed" refer to or indicate work or materials that may be acceptable or approved by the Architect, as the Owner's representative during the construction phase, only to the extent the work or materials conform to the requirements of the Contract Documents and in no way shall be interpreted to imply any responsibility on the part of the Architect concerning the Contractor's obligations under the requirements of the Contract Documents.

§ 1.1.9.3 Term "similar" means in its general sense and not necessarily identical.

§ 1.1.9.4 Terms "shown," "indicated," "detailed," "noted," "scheduled," and terms of similar import, refer to requirements contained in Contract Documents.

§ 1.1.9.5 "Defective work" includes but is not limited to movable or adjustable work which has not remained in good working order including hardware, weatherstripping, doors, windows, drawers, apparatus, machinery and electrical and mechanical equipment, except for normal wear.

§ 1.1.9.6 The term Knowledge, recognize and discover, their respective derivatives, and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor know, recognizes and discovers in exercising appropriately and in accordance with industry standards, the care, skill and diligence required by the Contract Documents. Analogously, the expression reasonably inferable and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a Contractor familiar with the Project and exercising the care, skill and diligence required of the Contractor by the Contract Documents.

§ 1.1.9.7 When the word "provide" including derivatives thereof is used, it shall mean to properly fabricate, transport, deliver, install, erect, construct, test and furnish all labor, materials, equipment and related items necessary to complete the Work as required by the Contract Documents.

§ 1.1.9.8 The term "persistently" and other similar expressions, as used in reference to the Contractor, shall be interpreted to mean any combination of material acts and omissions, which causes the Owner or the Architect to reasonably conclude that the Contractor will not complete the Work within the Contract Time, for the Contract Sum or in substantial compliance with the requirements of the Contract Documents.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 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.

§ 1.2.4 In the event of any conflict among the Contract Documents, the provisions with the more stringent requirements requiring the better quality or greater quantity of the Work shall be estimated upon and provided. If application of the preceding sentence is not sufficient to resolve the conflict, then the following sentence shall also be applied: the more specific and more detailed descriptive information shall take precedence over the general and

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less detailed descriptive information. Any work, labor, materials or equipment that may be reasonably inferred from the Contract Documents as being required to produce a functionally complete Project or Work or part thereof shall be supplied by the Contractor whether or not specifically stated in the Contract Documents. In the case of uncertainty or doubt, the Contractor shall promptly request in writing, clarification from the Architect. The Contractor shall request such clarification in sufficient time to avoid delays and additional costs, in accordance with the provisions of Section 4.2.11.

§ 1.2.4.1 In connection with the Drawings, specified dimensions shall take precedence over scaled measurements and large scale drawings take precedence over small scale drawings.

§ 1.2.4.**2** Before ordering any materials or performing any Work, the Contractor and each Subcontractor shall verify measurements at the Project Site and shall be responsible for the correctness of such measurements. No additional compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the Drawings. Any difference between field measurements and dimensions set out in the Contract Documents shall be submitted to the Architect for resolution before proceeding with the Work.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment 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 this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them 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 material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

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 to Architect and Contractor a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Any changes in the designation of a representative shall be made in writing. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such

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information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 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.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 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 persistently 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.

§ 2.4 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 written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

§ 2.5 EXTENT OF OWNER RIGHTS

§ 2.5.1 The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limiation of any right of the Owner granted in the Contract Documents, at law or in equity.

§ 2.5.2 In no event will the Owner have control over, charge of or any responsibility for construction means, methods, techniques, services, or procedures or for safety precautions and programs in connections with the Work, notwithstanding any rights and authority granted the Owner in the Contract Documents.

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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 authorized representative.

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

§ 3.1.3 The Contractor shall not be relieved of 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. The Contractor and each Subcontractor have evaluated and satisfied themselves as to the conditions and limitations under which the Work is to be performed, including, without limitation (1) the location, condition, layout and nature of the Project site and surrounding areas; (2) the prevailing climatic conditions; (3) anticipated labor supply and costs; (4) availability and cost of materials, tools and equipment; and (5) other similar issues which in any way may affect the cost or time for performing the Work. The Owner assumes no responsibility or liability for the safety of the Project. The Contractor shall be solely responsible for providing a safe place for the performance of the Work. The Owner shall not be required to make any adjustment in either the Contract Sum or Contract Time in connection with any failure by the Contractor or any Subcontractor to comply with the requirements of the Contract Documents.

§ 3.2.1.1 After notifying the Architect, in writing, of any error, inconsistency, or omission discovered in the Contract Documents, the Contractor shall not proceed with any Work so affected without Architect's written interpretation and decision.

§ 3.2.1.2 The Architect shall have the final authority to determine whether any change or modification should be made, and no change or modification of any kind shall be made except on the Architect's written instructions.

§ 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 2.2.3, 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. The Contractor shall satisfy itself as to the accuracy of all grades, elevations, dimensions and locations. In all cases of interconnection of its Work with existing or other work, it shall verify at the site all dimensions relating to such existing or other work which is apparent from a reasonable inspection. Any errors due to the Contractor's failure to so verify all such grades, elevations, locations or dimensions shall be promptly rectified by the Contractor without any additional cost to the Owner or adjustment to the Contract Time.

§ 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

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3.2.3, the Contractor shall make 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 as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work. Further, the Contractor shall be fully and solely responsible for the jobsite safety.

§ 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.

§ 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 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.

(Paragraph deleted)

§ 3.4.3 The products specified or indicated on the Drawings or in the Specifications are used only to denote the quality standard of product desired. The term "equal" or "or equal", used in the Specifications is defined as meaning "equal in the professional judgment of the Architect." Approval of other products or requests for substitution shall be at the Architect's discretion and in accordance with provisions of the Bidding Requirements or General Requirements of the Specifications.

§ 3.4.4 A request made by the Contractor for a substitution is a representation to the Architect as follows:

.1 The Contractor has investigated the proposed substitute and determined that it is equal or superior in all respects to that specified.

.2 The Contractor will provide the same warranty for the substitute product as for that specified.

.3 The Contractor will coordinate the installation of the accepted substitute, making such changes as may be required to complete the Work in all respects.

§ 3.5 WARRANTY

The Contractor warrants to the Owner that the materials and the equipment furnished under the Contract will be new unless otherwise required or permitted by the Contract Documents, and that the Work will be free from defects not inherent in the quality required or permitted and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved, will be considered non-conforming. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.1 All warranties shall take effect on the date of Substantial Completion of the Work or designated portion thereof which includes the items covered by warranties, not on the date of installation of any specific product.

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§ 3.6 TAXES
The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.6.1 Taxes include, without limitation, Old Age Pension, Unemployment and any other and all taxes imposed by local, City, Parish, or the Federal Government and include such expenses or taxes as a part of the stipulated Contract sum.

§ 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS
§ 3.7.1 Except as set forth in Paragraph 2.2.2, the Contractor shall include in the Contract Sum and secure, pay for, and, as soon as practicable, furnish the Owner with copies or certificates of all permits including, without limitation, all building permits as required by governmental authorities having jurisdiction over the Project, and fees, licenses, and inspections necessary for the proper execution and completion of the Work. All construction charges, assessments, or inspection fees as may be imposed by any municipal agency or utility company are included in the Contract Sum and are the Contractor's responsibility.

§ 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.

§ 3.7.3.1 The Contractor, at his own expense, shall record , prior to commencement of the Work, a Notice of Contract and required performance and payment bonds with the Clerk of Court or Recorder of Mortgages of the Parish where the Work is to be performed. Contractor shall furnish the Architect and Owner with all recordation information, including date, time, book and folio number.

§ 3.7.4 Concealed or Unknown Conditions. Contractor represents that it has investigated the site and is familiar with all known, apparent, or reasonably discoverable conditions, subsurface or otherwise, which will be encountered at the site, and that Contractor has taken those conditions into account in establishing the Contract Sum and the Contract Time, as well as all other conditions concerning the performance of the Work, including without limitation, underground and above ground utilities, work space restrictions, work hour restrictions, noise restrictions, restrictions on site ingress and egress, weather conditions, ground water, dewatering requirements, temporary and permanent utilities relocation, ventilation requirements, and all other restrictions, demands, and requirements needed for the timely and adequate performance of the Work required by the Contract Documents, and all such conditions have been assumed by Contractor and our reflected and incorporated into the Contract Sum and the Contract Time, Subject to the foregoing, 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 21 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 an equitable adjustment 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 in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed 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

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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 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The Contractor shall include identification of the critical path, i.e. where any delay in the completion of these tasks will lengthen the Project's completion, unless appropriate action is taken.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be 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, 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.

§ 3.10.4 In the event the Architect determines that the performance of the Work has not progressed or reached the level of completion required by the Contract Documents, the Owner, upon the recommendation of the Architect,

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shall have the right to order the Contractor to take corrective measures necessary to expedite the progress of the construction, including, without limitation, (1) working additional shifts or overtime, (2) supplying additional manpower, equipment, and facilities, and (3) other similar measures (hereinafter referred to as "Recovery Measures"). Such Recovery measures shall continue until the progress of the Work achieves the stage of completion required by the Contract Documents. The Owner's right to require Recovery Measure is solely for the purpose of ensuring the Contractor's compliance with the construction schedule.

§ 3.10.4.1 The Contractor shall not be entitled to an adjustment in the Contract Sum in connection with Recovery Measures required by the Owner under or pursuant to this Paragraph 1.10.4 unless the Recovery Measures were directed by the Owner to recover from delays for which the Contractor was entitled to an extension of the Contract Time pursuant to the Contract Documents, and said extension of time was timely and properly requested by Contractor and improperly denied by Owner.

§ 3.10.4.2 The Owner may exercise the rights provided the Owner under pursuant to this Paragraph 3.10.4 as frequently as the Owner deems necessary to ensure that the Contractor's performance of the Work will comply with the completion date set forth in the Contract Documents.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be 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 the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action **§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

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§ 3.12.7.1 Failure by the Contractor to submit Shop Drawings shall be at the Contractor's sole risk and may result in rejection of any completed or partially completed Work (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 requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing 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 written 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. 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 cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional and who shall comply with reasonable requirements of the Owner regarding qualifications and insurance. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Architect has specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the purpose of checking for conformance with information given and the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.12.11 Additional information and procedures for handling Shop Drawings, Product Data and Samples is specified in the General Requirements (Division 1 of the Specifications).

§ 3.13 USE OF SITE

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

§ 3.13.1 The Owner shall have the right to use any and all portions of the site and the Work in accordance with Article 6, provided that such occupancy does not hamper the Contractor or prevent his efficient completion of the Work. Such use shall not constitute an acceptance of the Contractor's work in whole or in part.

§ 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 and patching shall be restored to the condition existing prior to the cutting, fitting and 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 such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

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§ 3.14.3 Additional information and procedures for Cutting and Patching is specified in the General Requirements (Division 1 of the Specifications).

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or 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 Owner shall be entitled to reimbursement from the Contractor.

§ 3.15.3 Additional information and procedures for Cleaning Up is specified in the General Requirements (Division 1 of the Specifications).

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Architect 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 such 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 the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

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

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 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, and Architect. Consent shall not be unreasonably withheld.

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

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate For Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) 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 FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

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

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such 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, material and equipment 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.

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§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize 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 duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents. There will be no restriction on the Owner having a representative.

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

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

(Paragraph deleted)

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 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, at the pre-construction conference, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. No payments will be due and payable to the Contractor until the Contractor submits the information required in this Section.

§ 5.2.2 The Contractor shall be solely responsible for selection and performance of all Subcontractor and suppliers The Contractor shall not be entitled to an increase in the Contract Time or the Contract Sum due to a problem with performance or non-performance of a Subcontractor or supplier.

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§ 5.2.3 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

(Paragraphs deleted)

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

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

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

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

§ 5.4.2 Upon such assignment 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 not be legally responsible for all of the successor contractor's obligations under the subcontract.

(Paragraph deleted)

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 Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 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 other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report 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, except as to defects not then reasonably discoverable.

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§ 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 the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors 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.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work. Except as permitted in Section 7.3 and Paragraph 9.7.2, a change in the Contract Sum or the Contract Time may be accomplished only by Change Order or by a Construction Change Directive signed by the Owner's representative. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance or alterations or additions to the Work and no claim that Owner has been unjustly enriched by any alteration of or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Owner, shall be the basis of any claim for an increase in the amount due under the Contract Documents or a change in the Contract Time or any time period provided for in the Contract Documents.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written order to the Contractor signed by the Owner and the Architect, issued after execution of the Contract, authorizing a change in the work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum and/or the Contract Time.

§ 7.2.2 "Cost of the Work" for the purchase of Change Orders shall be costs required to be incurred in performance of the Work and paid by the Contractor and Subcontractor which shall consist of:

1. Wages paid to direct labor personnel, delineating a labor burden markup for applicable payroll taxes, worker's compensation insurance, unemployment compensation, and social security taxes.
2. Cost of all materials and supplies, including the identification of each item and its cost.
3. Reasonable rental rates for machinery and equipment.
4. Other documented direct costs.

§ 7.2.3 "Overhead and profit" The Contractor and Subcontractor shall be due job-site and home office fixed overhead and profits on the Cost of the Work, but shall not exceed a total of 18% of the direct cost of any portion of Work, as specifically set out in **§ 7.2.4** The credit to the Owner resulting from a change in the Work shall be the sum of those items above, except credit will not be required for overhead and profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit will only be computed on the net extra cost to the Contractor.

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§ 7.2.4 After a Change Order has been approved, no future requests for extensions of time or additional cost shall be considered or recoverable for that Change Order work.

§ 7.2.5 The Contractor will be due extended fixed job-site overhead for time delays only when complete stoppage of work occurs causing a contract completion extension and the Contractor is unable to mitigate financial damages through replacement work. The stoppage must be due to acts or omissions solely attributable to the Owner. In all cases the Contractor is to notify the Architect in writing as required in Article 15. Reasonable proof may be required by the Architect that alternate work could not be performed. Reasonable proof may be required by the Architect that the stoppage adversely affected the date of Substantial Completion.

§ 7.2.6 Cost of Work whether General Contract cost or Subcontract cost shall not apply to the following:

1. Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices not specifically charged to the project.
2. Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the work.
3. Overhead and general expenses of any kind or the cost of any item not specifically and expressly included above in Cost of the Work.
4. Cost of supervision not specifically required by the Change Order unless said change order extends the project duration.

§ 7.2.7 When applicable as provided by the Contract, the cost to Owner for Change Orders shall be determined by quantities and unit prices. The quantity of any item shall be as submitted by the Contractor and approved by the Architect. Unit prices shall cover cost of Material, Labor, Equipment, Overhead and Profit.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

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

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

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

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; calculated in accordance with § 7.2, but not to exceed a specified amount; or

.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 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.

§ 7.3.6 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.

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§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine 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 the Agreement, or if no such amount is set forth in Section 7.2. 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 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment,

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 Other documented direct costs of the Work.

§ 7.3.7.1 "Cost of the Work" whether General Contract cost or Subcontract cost shall not apply to the following:

.1 Salaries or other compensation of the Contractor's personnel at the Contractor's principal office and branch offices.

.2 Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the work.

.3 Overhead and general expenses of any kind or the cost of any item not specifically and expressly included above in cost of the Work.

.4 Cost of supervision not specifically required by the Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.3.11 In subparagraph 7.3.6, an allowance for the combined overhead and profit for Change Orders and Construction Change Directives included in the total cost to the Owner shall be based on the following schedule:

.1 For the Contractor, for work performed by the Contractor's own forces, 10 percent of the cost.

.2 For the Contractor, for work performed by the Contractor's Subcontractor, 8 percent of the amount due the Subcontractor.

.3 For each Subcontractor or Sub-subcontractor, for work performed by that Subcontractor's or Sub-subcontractor's own force, 10 percent of the cost.

.4 For each Subcontractor, for work performed by the Subcontractor's Sub-subcontractors, 5 percent of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with subparagraph 7.3.6.

.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of cost including labor, materials, subcontracts and equipment cost. Labor and

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materials shall be itemized in the manner prescribed above. Where major cost items are subcontracts, they shall be itemized also. In no case will a change be approved without such itemization.

.7 Overhead and profit shall not exceed a total of 18% of the direct cost of any portion of the work.

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

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 Contract Time shall be based on Consecutive Calendar Days (Weekdays, Saturdays, Sundays and Holidays inclusive). A Calendar Day is one of 24 hours beginning at 12:00 midnight.

§ 8.1.5 Contractor shall commence work under this Contract on date specified in the Notice To Proceed and fully complete the Work of the Project within number of Consecutive Calendar Days (Weekdays, Saturdays, Sundays and Holidays included) stated in the Agreement. The Contract Time shall not be changed by the Contractor's submission of a schedule which shows a completion date earlier than the Contract completion date, unless specifically authorized by Change Order.

§ 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. The Contractor agrees to commence work not later than five (5) days, unless noted otherwise, after the transmittal date of a written notice to proceed from the Owner or the issuance of the building permit, whichever is later and to substantially complete the project within the Contract Time. The Owner will suffer financial loss if the project is not substantially complete in the time set forth in the Contract Documents. The Contractor and the Contractor's surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as fixed, agreed upon liquidated damages for each consecutive calendar day (Saturdays, Sundays and holidays included) of delay until the work is substantially complete. Such Liquidated Damages shall be withheld by the Owner from the amounts due the Contractor for progress and/or final payments.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 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 an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by fire, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may recommend, subject to Owner's approval. If the claim is not made within the time limits set out in Article 15, all right for future claims for that month are waived.

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§ 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.

§ 8.3.4 If the Contractor submits a schedule or a progress report indicating, or which otherwise expresses an intention to achieve, completion of the Work prior to any completion date required by the Contract Documents or the expiration of the Contract Time, the Owner will not be liable to the Contractor for any failure of the Contractor to so complete the Work by such date or time.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

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.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.2.2 In general, the Contract Sum shall be distributed in accordance with the type of work designated by the Technical Sections of the Specifications with one additional line item for the value of jobsite overhead. In the case of large projects sections shall be subdivided further into component parts of the Technical Sections as the Architect determines.

§ 9.2.3 All line items shall be composed of a base dollar value to which shall be added a dollar value for home office overhead and a dollar value for profit.

§ 9.2.4 Total of all items shall be equal to total Contract Sum. This schedule, when approved by Architect, will be used as the only basis for contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 Monthly, the Contractor shall submit to the Architect an Application & Certificate for Payment on the AIA Document G702-1992, accompanied by AIA Document G703-1992, and supported by any additional data substantiating the Contractor's right to payment as the Owner or the Architect may require. One original copy shall be signed and notarized. Provide amount of copies as indicated in Division 1 of the Specification. An Application for Payment shall be submitted on or about the first of each month for the value of labor and materials incorporated into the work and of materials, suitably stored, at the site as of the twenty-fifth day of the preceding month, less normal retainage, as set out below:

§ 9.3.1.1 Retainage shall be 10% of the Contract Sum; except that on any public works contract of $500,000 or more, the amount retained shall not exceed 5% of the Contract Sum.

§ 9.3.1.2 Each Application for Payment shall be accompanied by the following, all in the form and substance satisfactory to the Owner:

1. A current Contractor's claim and lien waiver duly executed and an acknowledged sworn statement showing that all Subcontractors and material suppliers with whom the Contractor has entered into subcontracts or purchase orders, the amount of each such subcontract or purchase order, the amount requested for any Subcontractor and material suppliers and the requested progress payment and the amount to be paid to the Contractor for such progress payment, together with similar sworn statements from all such Subcontractors and material suppliers.
2. Duly executed waivers of mechanics' and material supplier's claims and liens from all Subcontractors and when appropriate, from material suppliers and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment; and

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3. All information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored on the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, including applicable insurance.

§ 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, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.3.4 At the time when final payment for all work, less retainage, is requested, a list of exceptions and a dollar value related thereto will be prepared by the Architect. A monetary value will be assigned to each item so that, if necessary in the professional judgment of the Architect, a supplementary retainage can be withheld in addition to the normal retainage, to cover such exceptions to acceptance.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part 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 comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. 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. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

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.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 persistent failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 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 material or equipment suppliers 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 Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment to Contractor within twenty days after receipt of such Certificate of Payment.

§ 9.6.2 The Contractor shall pay each Subcontractor and each supplier of equipment and material no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor or Supplier is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's and suppliers portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor and each supplier of equipment and material require each Subcontractor or Supplier to make payments to Sub-subcontractors and sub-suppliers 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 material and equipment 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 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, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment 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 and 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, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

§ 9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven (7) days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven (7) days after the date established in the Contract Documents the amount certified by the Architect, then the Contractor may, upon seven (7) additional days' written 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 shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

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§ 9.7.2 If the Owner is entitled to reimbursement or payment from the Contractor under or pursuant to this Contract or the Contract Documents, that payment will be made promptly upon demand by the Owner. Notwithstanding anything contained in this Contract or the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due the Owner, or if the Owner incurs any costs and expenses recoverable under applicable laws to cure any default of the Contractor in performance of the Work, or to correct defective Work, the Owner will have an absolute right to offset that amount against the Contract Sum and may, in the Owner's sole discretion, elect either to:

1. Deduct an amount equal to that which the Owner is entitled from any payment then or thereafter due the Contractor from the Owner; or
2. Issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the Owner is entitled.

§ 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 and the Owner has received a Certificate of Occupancy from regulatory authorities having jurisdiction over the Project.

§ 9.8.1.1 As applicable, the Contractor shall comply with the provisions of the Public Works Act (R.S.38:2241 et seq.) including those provisions pertaining to the recordation of the Contract and performance and payment bonds, and the preservation of statutory claims. Upon Substantial Completion of the Work and on the recommendation of acceptance by the Architect, the Owner shall accept the work by executing a formal Acceptance or a Certificate of Substantial Completion and the Contractor shall file either the Acceptance of the Certificate with the Recorder of Mortgages or the Clerk of Court of the Parish in which the Work is located. Issuance of the Acceptance or the Certificate of Substantial Completion shall not constitute a final acceptance of the Work.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. As a prerequisite to the work being accepted by Owner as substantially complete, the Owner must receive executed Roofing Contractor's and Roofing Manufacturer's guarantees, where roofing work is part of the Contract. Further, prior to Architect's inspection to determine Substantial Completion of the Work, the Contractor shall notify the Architect that the project is ready for inspection by the State Fire Marshal's office and any other regulatory authorities having jurisdiction over the Project. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.3.1 The Architect shall make this one additional inspection to determine Substantial Completion; if the work is still not acceptable, the Architect, and each of the Architect's principal consultants, shall be paid $195.00/hour for their time at the Project site, for each additional inspection, to be withheld from the unpaid funds remaining in the Contract Sum. The payment shall be made by the Owner and deducted from the construction contract funds.

§ 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, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate.

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§ 9.8.6 Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the work unless otherwise agreed to in writing by the Owner and Contractor. Unless otherwise agreed to in writing by the Owner and Contractor, security , maintenance, heat, utilities, damage to the Work not covered by the punch list and insurance shall become the Owner's responsibility on the Date of Substantial Completion.

§ 9.8.7 If all punch list items have not been completed by the expiration of the forty-five (45) days claim period, through no fault of the Architect or Owner, the Owner may declare the Contractor in default of the Contract and the surety shall be notified. If within thirty (30) days after notice of default, the surety has not completed the punch list, through no fault of the Architect or Owner, the Owner may, at its option, have the balance of the work completed by whatever means is most expedient and pay for such work with the unpaid funds remaining in the Contract Sum.

§ 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 as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project.

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

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

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, 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 terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. If the Architect does not find the Work finally complete under the Contract Documents, the Architect shall make one additional inspection; if the work is still not completed, the Architect, and each of the Architect's principal consultants, shall be paid $195.00/hour for their time at the Project site, for each additional inspection, to be withheld from the unpaid funds remaining in the Contract Sum. The payment shall be made by the Owner and deducted from the construction Contract Sum. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any retainage 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 and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial 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 and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, 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, and (6) a clear Lien and Privilege Certificate from the Clerk of Court for the Parish, State of Louisiana. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

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§ 9.10.2.1 Neither the final payment nor any part of the retainage shall become due until the forty-five (45) day period for filing statutory claims under the Public Works Act (R.S.38.2241 et seq.) has expired, the Contractor has delivered to the Owner a clear lien and privilege certificate issued by the Clerk of Court or Recorder of Mortgages in the parish where the Project is located, which certifies that no statutory claims have been recorded against the Project, , and all affidavits, consents and releases specified in paragraph 9.10.2 have been properly submitted.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed 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 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
(Paragraphs deleted)
Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

(Paragraph deleted)
§ 9.11 LIQUIDATED DAMAGES
§9.11.1 Should the Contractor fail to substantially complete the Work within the Contract Time or any properly granted extension thereof by Change Order, the Contractor shall be liable for and shall pay the Owner the sums stipulated in the Agreement as fixed, agreed, and Liquidated Damages for each calendar day of delay until the Work is substantially complete. It is further understood and agreed that Contractor's failure to achieve Substantial Completion on the date set forth in the Agreement shall constitute a default and breach of the Contract, and that the Contractor specifically waives formal notice of default.**§ 9.11.2** The Contract Time as stated in consecutive calendar days and the Liquidated Damages as stated in Dollars per Day shall be stated in the Agreement.

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 or the Contractor's Subcontractors or Sub-subcontractors; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on health and safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall 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 owners and users of adjacent sites and utilities. The Contractor shall also be responsible, at the Contractor's sole cost and expense, for all measures necessary to protect any property adjacent to the Project Site and improvements thereon which could be affected by the performance of the Work. Any

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damage to such property or improvement arising out of the performance of the Work shall be promptly and adequately addressed and/or repaired by the Contractor at the Contractor's sole cost and expense.

§ 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 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, except damage or loss 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, written notice of such 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
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos, lead or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written 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 such material or substance or who are to perform the task of removal or safe containment of such material or substance. 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 in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity. Notwithstanding the foregoing, Owner shall have no obligation to indemnify Contractor or its Subcontractors for any materials or substances encountered at the site if said materials or substances were placed or deposited at or about the site by Contractor, its Subcontractors, suppliers, material

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supplier, vendors or their employees or agents at any time during construction of, or during Contractor's performance of the Work pursuant to the Contract Documents.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for 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 materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor will purchase and maintain, as its expense, insurance of the types and amounts indicated below in order to protect the Contractor, Owner and Architect from claims that may arise out of or result from the Contractor's operations under the Contract, whether those operations are by the Contractor or by any Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. The types of coverage and the limits of coverage required by this Subparagraph are as follows:

.1 All insurance furnished in compliance with this Article shall include the Owner and the Architect as additional insureds and shall waive rights of subrogation against the Owner and Architect. Insurance shall be with a Best's A-rated company or better, acceptable to and approved by the Owner and duly authorized to conduct business in the State of Louisiana. The Owner and Architect so stated on all Insurance Certificates shall be as indicated in the Agreement. All such insurance policies required herein shall be endorsed to reflect and insure any occupancy by the Owner at time of such occupancy.

Type of Coverage	**Limit**
1. Workman's Compensation and Occupational Disease:	Statutory
Employer's Liability:	$1,000,000.00
2. Comprehensive General Liability: Include independent Contractor's Liability; Contractual, Broad Form Property Damage, and Personal Injury Liability; Explosion Collapse and Underground Liability. Owner and Architect to be named as Additional Insureds, and all coverages to be on the Occurrence Form. Completed Operations Liability to be maintained for at least two (2) years after the date of final completion.	
a. Bodily Injury and Property Damage, combined single limit:	

Init.

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Each Occurrence	$1,000,000.00
General Aggregate	$1,000,000.00
b. Products/Completed Operations Aggregate	$1,000,000.00

3. Automobile Liability: Include owned; non-owned; and hired automobile.
   a. Bodily Injury:

Each Person	$1,000,000.00
Each Accident	$1,000,000.00

   b. Property Damage:

Each Accident	$1,000,000.00

4. Umbrella Liability:
   a. Bodily Injury:

Each Occurrence	$1,000,000.00
Aggregate	$1,000,000.00

5. Builder's Risk: (Contractor will provide, see 11.3.1 below).

§ 11.1.2 The insurance required by Subparagraph 11.1.1 must be in form and substance satisfactory to the Owner and must in all cases be written on an occurrence basis, rather than a claims-made basis. The insurance must be issued by a carrier satisfactory to the Owner and authorized to do business in Louisiana and must be maintained until the entire Work is completed, except that the products and completed operation's coverages must be maintained for at least an additional three-year period following completion of the Work.

§ 11.1.3 Prior to commencement of the work, the Contractor shall forward to the Owner and Architect, two (2) copies each of the Certificate of Insurance evidencing that all required insurance is in force, on an approved Certificate of Insurance Form executed by an authorized representative of the Insurance Company. Copies of all policies must accompany the Certificate of Insurance. Each and every policy and Certificate shall contain an endorsement stating that the Insurance Company will not, prior to completion of project or any policy expiration date shown on the policy and certificate, whichever occurs first, terminate the policy or change any coverage therein without first mailing to the Owner and Architect, by registered mail, written notice of such action at least thirty days prior to the termination or change. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. 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. Contractor's right to payment is conditioned upon compliance with this Section.

§ 11.1.3.1 The Contractor must certify to the Owner and Architect that he has obtained similar Certificates of Insurance from each of his sub-contractors before their work commences. Each subcontractor must be covered by limits of 1 million per occurrence and 2 million in the aggregate.

§ 11.1.3.2 Indemnity Agreement: The Contractor's Comprehensive General Liability Insurance shall cover the Contractor's contractual obligations under Section 3.18, and this coverage shall be expressly indicated on the Certificate of Insurance.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents 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 during the Contractor's completed operations.

§ 11.1.5 Any and all deductibles for the insurance policies requested by the Section shall be assumed by and be at the sole risk and cost of the Contractor or Subcontractor.

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§ 11.1.6 SUBCONTRACTOR

Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates from each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

§ 11.1.7 DEDUCTIBLES AND SELF-INSURED RETENTIONS
Any deductibles or self-insured retentions must be declared to and approved by the Owner. At the option of the Owner, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, its officers, officials, employees and volunteers or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

§ 11.1.8 OTHER INSURANCE PROVISIONS
The policies are to contain, or be endorsed to contain, the following provisions:

§ 11.1.8.1 General Liability and Automobile Liability Coverages

§ 11.1.8.1.1 The Owner, its officers, employees and directors are to be added as "additional insureds" as respects liability arising out of activities performed by or on behalf of the Contractor, products and completed operations of the Contractor, premises owned, occupied or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Owner, its officers, officials, employees or volunteers.

It is understood that the business auto policy under "Who is an Insured" automatically provides liability coverage in favor of the Owner.

§ 11.1.8.1.2 Any failure to comply with reporting provisions of the policy shall not affect coverage provided to the Owner, its officers, officials, employees or directors.

§ 11.1.8.1.3 The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

§ 11.1.8.2 Worker's Compensation and Employer's Liability Coverage
The insurer shall agree to waive all rights of subrogation against the Owner, its officers, employees, directors for damages or losses arising from work performed by the Contractor for the Owner.

§ 11.1.8.3 All Coverages
Each insurance policy required by this Section shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipts requested, has been given to the Owner.

§ 11.1.9 ACCEPTABILITY OF INSURERS
Insurance is to be placed with insurers with an A.M. Best's rating of no less than A-:VI.
§ 11.2 OWNER'S LIABILITY INSURANCE
The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 The Contractor shall procure and maintain during life of this Contract an All Risk Builders Policy. The insurance shall include the interests of the Owner, Architect, the Contractor and all Sub-contractors as their interests may appear. Policy shall be of the all physical loss type, including flood. It shall be written on the completed Value Form. The policy shall carry a deductible not to exceed $2,500.00 for builders risk. The deductible for flood shall not exceed $10,000.00 and the deductible for wind shall not exceed 5 percent of the contract sum. The Owner, Architect and Contractor shall be the named insureds. Should the Contractor desire to obtain broader Builders' Risk Insurance, the Contractor will purchase such broader coverage at its own expense. Any difference between the Contractors furnished Builder's Risk Insurance and the Contractor's usual risk insurance in any broader type coverage will not affect the Contractor's Liability to the Owner.

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(Paragraph deleted)
§ 11.3.1.1. If the property insurance requires deductibles, the Contractor shall pay costs not covered because of such deductibles.

§ 11.3.1.2 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.3 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

(Paragraphs deleted)
§ 11.3.2 BOILER AND MACHINERY INSURANCE
The Contractor shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE
The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused.

§ 11.3.4 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 included in an appropriate Change Order.

(Paragraph deleted)
§ 11.3.6 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 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Owner.

§ 11.3.7 WAIVERS OF SUBROGATION
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, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, 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 covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Contractor property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

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§ 11.3.9 The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. 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 after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Contractor shall furnish a Performance Bond and a Labor and Material Payment Bond in form and substance satisfactory to the Owner, and without limitation, complying with the following specific requirements:

1. The Bonds shall be executed by a good and solvent surety licensed in the State of Louisiana and approved by the Owner, and shall remain in effect for a period not less than five (5) years following the date of Substantial Completion of the Work;
2. The Performance Bond and the Labor and Material Payment Bond shall each be in an amount equal to the Contract Sum; and
3. The surety on both the Performance Bond and the Labor and Material Payment Bond shall agree that it shall be obligated under the Bonds to any successor, grantee or assignee of the Owner.

§ 11.4.1.1 The Contractor shall deliver the required bonds to the Owner not later than the date of execution of the Agreement, or if the Work is commenced prior thereto in response to a "Notice to Proceed" or letter of intent, the Contractor shall prior to commencement of Work, submit written evidence satisfactory to the Owner such bonds will be issued. The Contractor shall also submit copies to the Architect.

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

§ 11.4.2 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.

§ 11.4.3 The Contractor shall record, prior to commencement of the Work, the Contract (Public Works) or a Notice of Contract (Private Works) and the Performance and Payment Bonds with the Recorder of Mortgages or the Clerk of Court in the Parish in which the Project is located.

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 Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

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§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.**§ 12.2.1.1** Defective or nonconforming Work includes but is not limited to movable or adjustable work which has not remained in good working order including hardware, weatherstripping, doors, windows, drawers, apparatus, machinery and electrical and mechanical equipment, except for normal wear.

§ 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 an 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 written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4. If the Contractor fails to promptly and properly correct Work identified as defective and/or covered by a general or special warranty, the Owner may declare the Contractor is in default and notify the Surety. If the Surety fails to cure the default within thirty (30) days of receipt of notice of the default, the Owner may have the work corrected, repaired or replaced by whatever means is most expedient and seek reimbursement of the costs from either the Contractor or its Surety or both.

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

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

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

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors 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

The Contract shall be governed by the law of Louisiana.

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§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Except as expressly provided in the Contract Documents 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.

§ 13.4.2 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 there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received and accepted and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 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 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 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.

§ 13.5.5 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.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

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§ 13.6 INTEREST
Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Paragraphs deleted)
§ 13.7 EQUAL OPPORTUNITY
§ 13.7.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: Employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post inconspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

§ 13.7.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT
§ 14.1 TERMINATION BY THE CONTRACTOR
§ 14.1.1 The Contractor may terminate the Contract if:

1. The Work is stopped for a period of 30 days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under contract with the Contractor, for any of the following reasons:
    a. Issuance of an order of a court or other public authority having jurisdiction;
    b. An act of government, such as a declaration of nation emergency, making material unavailable or which requires all Work to be stopped;
    c. 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 Subparagraph 9.4.1. or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents.
2. Suspensions, delays or interruptions of the Work by the Owner as described in Section 14.3 constitute in the aggregate more than 50 percent of the total number of days scheduled for completion, or 60 days in any 365 day period, whichever is less.

§ 14.1.2 If one of the reasons described in Section 14.1.1 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.3 If the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

(Paragraph deleted)

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§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- **.1** repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- **.3** repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- **.4** otherwise is guilty of substantial breach of a provision of the Contract Documents; or-
- **.5** failure to complete the punchlist within the lien period as provided in 9.8.2.**3.**

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, 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' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- **.1** Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** Accept assignment of subcontracts pursuant to Section 5.4; and
- **.3** Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- **.1** that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or
- **.2** that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- **.1** cease operations as directed by the Owner in the notice;
- **.2** take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- **.3** except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 Upon termination by the Owner for convenience, the Contractor will recover as is sole remedy payment for that portion of the Work and Contractor's portion of overhead and profit thereon, properly performed prior to the

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effective date of termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the Owner's instructions.
The Contractor shall be paid for all reasonable costs required to secure the site, terminate subcontracts and purchase orders (including restocking charges) and perform any other work necessary to effect the termination of the Contract. The Contractor shall not be entitled to be paid its anticipated profit or overhead on work not performed prior to the termination. The Contractor hereby waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits. The Owner will be credited for:

.1 payments previously made to the Contractor for portions of the Work previously performed; and

.2 the value for the materials, supplies, equipment, or other items that are to be retained by the Contractor, with acquiescence of Owner, and that are part of the Contract Sum.

§ 14.4.4 Termination of a contract or a portion thereof, shall not relieve the Contractor of responsibility for the completed Work, nor shall it relieve the Surety of its obligation for any just claim arising from the work performed.

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, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Architect. Claims by either party must 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; provided, however, that the Claimant shall use its best efforts to furnish the Architect and the other party, as expeditiously as possible, with notice of any Claim once such Claim is recognized, and shall cooperate with the Architect and the party against whom the Claim is made in an effort to mitigate the alleged or potential damages, delay or other adverse consequences arising out of the condition which is the cause of such Claim.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, the Contractor shall document that weather conditions were abnormal for the period of time and had an adverse effect on the critical path of the Project schedule and could not have been reasonably anticipated.

(Paragraphs deleted)

§ 15.1.5.3 The following are considered reasonably anticipated days of adverse weather on a monthly basis:

January	11 days
February	10 days
March	8 days
April	7 days

Init.

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May	5 days
June	6 days
July	6 days
August	5 days
September	4 days
October	3 days
November	5 days
December	8 days

The Contractor's request for an extension of time due to adverse weather shall be considered only for those days which exceed the allowable number of days per month set forth herein. The Contract Time is computed on a calendar-day basis.

§ 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Architect for initial decision. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been rendered. Unless the Architect and all affected parties agree, the Architect will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Architect will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Architect is unable to resolve the Claim if the Architect lacks sufficient information to evaluate the merits of the Claim or if the Architect concludes that, in the Architect's sole discretion, it would be inappropriate for the Architect to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Architect may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Architect in rendering a decision. The Architect may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 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 no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Architect will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Architect will render an initial decision approving or rejecting the Claim, or indicating that the Architect is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

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§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4 and 9.10.5shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of a complaint or demand for arbitration, whichever is appropriate, but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

(Paragraphs deleted)

§ 15.4 ARBITRATION

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER

§ 15.4.4.1 The Owner, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 The Owner, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

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§ 15.4.4.2 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

(Paragraph deleted)

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DIVISION 1

GENERAL REQUIREMENTS

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SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Project description.
   2. Type Contract.
   3. Separate Contracts.
   4. Use of premises.
   5. Contractor’s examination of Site .
   6. Protection.
   7. Work phases.
   8. Owner's occupancy requirements.
   9. Documents to agencies.
   10. Owner-furnished items.
   11. Miscellaneous provisions.

1.3 RELATED REQUIREMENTS

A. Division 01 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.4 PROJECT DESCRIPTION

A. General: The Work of this Project consists of all work identified and otherwise required by the Contract Drawings, including Architectural, Structural, Civil, Mechanical, Plumbing, Electrical, and by the remainder of this Project Manual, including all Divisions and Sections. All Work indicated on the Documents is included in the Scope of this Work unless specifically indicated to be Not in Contract (N.I.C.).

B. Scope of Work: This project consists of the construction of a new 2,000+/- square foot, one-story building addition to the existing 4,000+/- library building in Edgard, Louisiana. The project will contain book stack areas, reading areas, computer area, study rooms, access portal and renovation of select existing areas.
   1. Perform all site demolition work indicated on the Drawings or as otherwise required to accomplish the finished results indicated. The Contractor shall make all required tie-ins to the Owner's existing utilities and shall perform all necessary shut downs, testing, verifications and certifications. All work of this nature shall be fully coordinated with the Owner.

2. Execute all construction work indicated and otherwise required to achieve the results indicated. The Work is a complete package of work from site demolition to final finishing. New construction shall be complete and finished, ready for the Owner's use. Upon Project completion all areas of construction shall be complete and ready for occupancy by designated users with no additional work by the Owner except for items of work specifically identified as being executed by the Owner or his agent. The Owner intends to occupy the existing building during construction of the new addition, until such time as the finish work is scheduled to take place in the existing building. The Contractor shall do this work without unduly disturbing ongoing functions of the existing library and shall protect all areas of the site not included in the Work but in proximity of Work during the execution of this Contract.

1.5 TYPE OF CONTRACT

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

1.6 WORK PHASES

A. The Work shall be conducted in one phase.

1.7 SEPARATE CONTRACTS

A. General: The Contractor shall assist and cooperate fully with the Owner and separate contractors, especially in setting time schedules, work sequences, and utilization of site areas for storage and unloading. The Contractor shall cooperate so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

B. Future Work: Owner may award separate contract(s) for the following additional work to be performed at site after Substantial Completion. Completion of that work will depend on successful completion of preparatory work under this Contract.
   1. A separate contract(s) may be awarded for the installation of furniture, furnishings and specialized equipment.

1.8 USE OF PREMISES

A. General: Owner intends to occupy adjacent portions of the existing building during the construction period. Contractor shall have defined use of premises, as indicated on drawings, for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited to operations directly related to the performance of the Contract and by Owner's right to occupy the adjacent building areas and project site during normal operating hours and to perform work with its own forces and to employ separate contractors on portions of the Project.

B. Owner will be responsible for the removal/relocation of all existing furniture, book stacks, associated media, artwork and wall hung articles as required to facilitate the

renovation of the existing space(s) as indicated on drawings. Refer to "Not In Contract" lists and notations in drawings for additional information.

C. Use of Site: Limit use of premises to work in areas and areas permitted within the Contract. Do not disturb portions of Project site beyond areas in which the Work as indicated.
   1. Limits: Confine construction operations as indicated on the drawings:
   2. Owner Occupancy: Allow for Owner occupancy of Project site as the completion of project construction will allow. Allow for public use and access to those areas surrounding the Project site.
   3. Driveways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, general public and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
      a. Schedule deliveries to minimize use of driveways and entrances.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.9 OWNER'S OCCUPANCY REQUIREMENTS

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

1.10 WORK RESTRICTIONS

A. On-Site Work Hours: Work shall be generally performed on the project site during normal business working hours of 7:00 a.m. to 7:00 p.m., Monday through Friday, except otherwise indicated.
   1. Weekend Hours: Work shall be generally performed on the project site during the hours of 7:00 a.m. to 7:00 p.m.
   2. Early Morning Hours: Coordinate with Owner's representative. Provide 72 hours notice prior to beginning work, minimum.
   3. Hours for Utility Shutdowns: Coordinate with Owner's representative. Provide two week's notice prior to date of anticipated shutdown, minimum. Do not begin work without Owner's representative approval.

4. Hours for Noisy Construction: Coordinate with Owner's representative. Provide 72 hours notice prior to beginning noisy work, minimum. Do not begin work without Owner's representative approval.
5. Contractor may have additional access to the site outside these hours upon 72 hour notification and approval by the Owner's representative.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Architect and Owner not less than 7 days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

C. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted without Owner's permission.
1. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows or outdoor air intakes. Smoking is only allowed in designated areas.

D. Employee Identification: Provide identification tags for all Contractor personnel, including, but not limited to subcontractors, vendors and inspectors working on Project site. Require personnel to use and display identification tags at all times.
1. Maintain list of approved screened personnel with Owner's representative.

1.11 EXAMINATION OF SITE

A. Examination of Documents and Site: Contractor shall carefully examine Documents and the Construction Site to obtain the first-hand knowledge of scope and the conditions of the Work. The Contractor, by signing a Contract to perform the Work, represents and warrants that he has examined Drawings, Specifications and site of the Work and from his own investigation has satisfied himself as to scope, accessibility, nature and location of Work, character of equipment and other facilities needed for performance of work, character and extent of the work to be performed, local availability, practices, and jurisdiction and other circumstances that affect performance of work. Contractor shall make sufficient investigation to ascertain that existing conditions are as represented on the Drawings and that the final results can be achieved as shown on the Drawings. No additional compensation will be allowed by the Owner for failure of Contractor to fully inform himself as to conditions affecting Work. Dimensions of existing site shown on the Drawings may not represent actual dimensions and should be assumed to be approximate. The Contractor shall verify existing dimensions and conditions, which would affect new work before proceeding with actual construction. Contractor will not be entitled to additional compensation if existing dimensions or conditions vary from that shown on the Contract Documents.

B. Contractor's Representation: By executing the Contract, the Contractor represents that he has:
1. Visited the site;
2. Made due allowances for difficulties and contingencies to be encountered;

3. Compared Contract Documents with work in place;
4. Informed himself of existing conditions, and;
5. Notified the Architect of ambiguities, inconsistencies, and errors discovered in the Contract Documents, or between the Contract Documents and existing conditions.
6. Subcontractors' Representation: Each subcontractor shall similarly represent that he has fulfilled the same responsibilities to the Contractor.
7. Responsibility: Failure to visit the site and perform attendant responsibilities listed above shall not relieve the Contractor or any subcontractor from their obligations, and no extra payment will be authorized for work related to conditions which can be determined by examination of the site and the Contract Documents.

1.12 PROTECTION

A. Protection: During construction the weatherproof and waterproof integrity of the existing structures shall continuously be maintained. Temporary provisions shall be provided wherever and whenever required. The Contractor shall take all reasonable precautions to protect existing property, systems and equipment. All damages to existing structures, systems and spaces resulting from violation of weatherproof integrity shall be rectified by the Contractor at no expense to the Owner. Additionally, at completion of the Work, all areas of the site damaged or otherwise adversely affected by the work under this Contract shall be repaired, replaced, or otherwise returned to their original conditions without cost to the Owner.

1.13 DOCUMENTS TO AGENCIES

A. The Owner has submitted documents to the State Fire Marshal. The Contractor shall pay for any additional permits, reviews, fees and inspections required by authorities having jurisdiction after signing the Owner/Contractor Contract. All other required arrangements, including but not limited to, the securing of occupancy certificates, scheduling and passing inspections, etc., shall be the responsibility of the Contractor. **THE CONTRACTOR IS REQUIRED TO PAY FOR ALL PERMITS**.
   1. Contractor shall be responsible for all building permits, utility connection fees and all permits including Substantial Completion and occupancy of building.
   2. Subcontractors shall be responsible for permits in each discipline.

1.14 OWNER-FURNISHED ITEMS

A. OWNER-FURNISHED PRODUCTS
   1. Owner will furnish products indicated. The Work includes providing support systems to receive Owner's equipment and making plumbing, mechanical, and electrical connections. The Contractor shall review this information and advise the Architect of any observed potential conflicts or problems related to Owner-furnished items.
      a. Owner will arrange for and deliver Shop Drawings, Product Data, and Samples to Contractor.
      b. Owner will arrange and pay for delivery of Owner-furnished items according to Contractor's Construction Schedule. The Contractor is responsible for

designating the delivery dates of Owner-Furnished items in the Construction Schedule. These dates must be flagged on each Schedule.

c. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.

2. Owner-Furnished/Owner Installed Products: The Owner will provide under separate contract materials and equipment items as indicated on the Drawings. The work under this contract includes support systems (wall blocking, ceiling support, support as required for installation) to receive and support Owner's equipment, and mechanical and electrical services and connection. The Contractor and Owner's Contractor shall coordinate all rough-in openings, mechanical and electrical requirements for a smooth installation.

1.15 MISCELLANEOUS PROVISIONS

A. Removal and Reinstallation of Work: Additional payment will not be authorized for relocation, removal, and/or temporary removal and reinstallation of any existing or newly installed construction (ducts, conduit, piping, wiring, fixtures, equipment, finishes, sidewalks, etc.) necessary to properly complete the Work, which could have been anticipated by careful examination of the site and the Documents. Such Work shall be performed, without additional cost to the Owner.

B. The Contractor shall be responsible for the preservation of all public and private property, monuments, highway signs, telephone lines, other utilities, etc., along and adjacent to the Work; shall use every precaution necessary to prevent damage to pipes, conduits, and other underground structures; and shall protect carefully from disturbance or damage all land monuments and property marks until an authorized agent has witnessed or otherwise referenced their locations and shall not remove them until directed. The street and highway signs and markers, that are to be affected by the Work, shall be carefully removed when the work begins and stored in a manner to keep them clean and dry. The Contractor must obtain all necessary information in regard to existing utilities, and shall give notice in writing to the Owners of the property or the authorities in charge of streets, gas, water, pipes, electric, sewers and other underground structures, including conduits, railways, poles and pole lines, manholes, catch basins, fixtures, appurtenances, and all other property that may be affected by the Contractor's operations, at least three (3) working days before his operations will affect such property or as specified elsewhere. The Contractor shall not hinder or interfere with any person in the protection of such work or with the operation of utilities, at anytime.

C. When property or the operation of railways, telephone lines, telegraph lines or other public utilities are endangered, the Contractor shall at his own expense, maintain flagmen or watchmen and any other necessary precautions to avoid interruption of service or damage to life or property, and shall promptly repair, restore, or make good injury or damage caused by his operations in an acceptable manner.

D. Exploratory Utility Excavation: Utilities exploration shall include all labor, materials, and equipment necessary for the Contractor to conduct a field investigation including exploratory excavations in advance of construction for the purpose of determining the existing location, size, and depth of all underground utilities shown or identified on the Drawings, any and all meetings with representatives of each

utility, and furnishing the information to the Engineer. In addition to those utilities on the Drawings, the Contractor shall also make exploratory excavations of all utilities which could impact the construction. This work shall include all test pit excavations including backfilling with sand, compaction, dewatering, pavement removal and replacement, and other related items.

E. Owner will provide Contractor 5 sets of Construction Documents for use during construction.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 1028

PARISH TAX EXEMPT STATUS – FILING PROCEDURES

PART 1 - GENERAL

1.1 PROCEDURES

A. St. John the Baptist Parish, as a political subdivision of the State of Louisiana, is a tax-exempt entity. As such, St. John the Baptist Parish reserves their right to take advantage of their tax status on any or all purchases of material(s) being incorporated into this project. The Contractor and Subcontractors hereby agree to cooperate in providing information relating to the value of materials to be purchased for the purpose of the St. John the Baptist Parish's monitoring and documenting of all materials purchased free of sales tax.

B. The Contractor and Subcontractors are to include all required state and local sales or use tax in their bid proposals as it will be the option of the Parish to take advantage of their tax exempt status.

C. All aspects of purchasing will be monitored by a "Construction Professional" employed by the St. John the Baptist Parish. Prior to a proceed order being issued, the Contractor and Subcontractors will meet with the monitor to establish dollar amounts included in their estimates for materials by Divisions or Subdivisions thereof, of the specifications. Upon proceeding, as purchase order amounts are established and issued, the information shall be made available to the monitor to post against the established material values. As monthly payment requests are processed and payment made to the General Contractor, actual invoice amounts expended toward the purchase order(s) shall be made available to the monitor with proper documentation.

D. Separate columns for the materials and sales taxes will be set up on the Payment Request format. Only the sales tax value will be deducted for material purchases and no Contractor's or Subcontractor's labor, insurance, equipment, overhead, mark-up or bonds will be deducted from the particular line item. The material's tax value will be deducted as each monthly payment request is submitted by the Contractor, thereby being paid for the percentage of the completed work on a given line item less the value of the sales tax.

E. Periodically deductive Change Orders will be issued for the tax savings with a final deductive Change Order being issued at the completion of the project, thereby reducing the total Contract amount due the Contractor by the value of the material's sales tax. This states that taxes which are to be included in the bid will be recouped through periodic deductive Change Orders throughout this job.

F. The Contractor and/or Subcontractors remain entirely responsible for establishing delivery dates, receiving, protecting and/or storing the materials from the vendor(s) and installing same. The Contractor shall at all times have the care, custody and control of the materials and maintain insurance sufficient to cover the value of the materials.

It shall be stated on each purchase order "All materials furnished with this purchase order shall be shipped to _____, Contractor, and used exclusively on Owner Project No. 21205.00, identified as the St. John the Baptist Parish, Edgard Library Addition/Renovation, located in Edgard, LA.

G. Follow direction of Owner's instructions and documentations.

1.2 INDEMNIFICATION

A. St. John the Baptist Parish, as Owner, agrees to indemnify, defend and hold Contractor fully harmless from and with respect to any State or local sales or use tax liability claimed, alleged, or asserted by any State or local government agency with respect to the purchase, use, consumption or storage of materials and supplies and rental of equipment on which any said claim is based were made strictly in accordance herewith and further provided that the items in question were purchased or rented exclusively for this particular Project and delivered by the vendor or vendors in question directly to job site or to a bonded storage facility. Specifically, this agreement to indemnify, defend and hold harmless from and with respect to sales and/or use taxes shall not apply in the case of any materials or supplies purchased by Contractor or Subcontractors for their own inventory.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 2300

ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes:
   1. Administrative and procedural requirements for Alternates.
   2. Schedule and general description of Alternates.
B. Related Sections include:
   1. Louisiana Uniform Public Work Bid Form: List of Alternates to be bid.

1.3 DEFINITIONS

A. Alternate: An Alternate is a change in either the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in Contract Documents.
   1. An Alternate Bid is a cost, proposed by Bidders and stated on the Bid Form that may be added to or deducted from the Base Bid for the change in construction activities defined by the Alternate.
   2. The decision to accept or not accept any Alternate and the corresponding change in the Bid Sum is at the sole discretion of the Owner.
   3. The Alternate Bid amount shall include the Contractor's overhead and profit, and all costs for the change in construction activities, including related coordination, submittals, testing, adjusting and cleaning, and modifications and adjustments to other construction necessary for the proper implementation and incorporation of the Alternate.

1.4 PROCEDURES

A. Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the project.
   1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
B. Notification: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.
C. Accepted Alternates: Execute accepted Alternates under the same conditions as other Work of this Contract.

D. Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule of Alternates contain requirements for materials necessary to achieve the Work described under each Alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: The "Schedule of Alternates" and applicable Specifications Sections contain requirements for execution necessary to achieve the Work under the Alternates.

3.2 SCHEDULE OF ALTERNATES

A. General: Provide all materials, labor, equipment and other items as required to fully perform and complete the Work of the Alternates generally described herein and as delineated on the Drawings.

ALTERNATE NO. 1: REFINISHING OF EXISTING METAL ROOF PANEL SYSTEM

Additive Alternate: All work involved with cleaning and repainting existing standing seam roof panel system. Work includes, but is not limited to as indicated in the following:

1) **Specifications:**
   a. Section 09 9600 – High Performance Coatings.

2) **Sheets:**
   a. A101 – New Site Plan/Roof Plan.

ALTERNATE NO. 2: NEW ENTRY CANOPY

Additive Alternate: All work involved with construction of new entry canopy, related support structure and foundation, and lighting. Work includes, but is not limited to as indicated in the following:

1) **Specifications:**
   a. Section 03 – Poured-In-Place Concrete.
   b. Section 04 2000 – Unit Masonry.
   c. Section 05 – Structural Steel.
   d. Section 05 4000 – Cold-Formed Metal Framing.
   e. Section 07 2500 – Weather Barriers.
   f. Section 07 4113 – Metal Roof Panels.
   g. Section 07 2423 – Direct-Applied Finish System.
   h. Section 07 6200 – Sheet Metal Flashing and Trim.
   i. Section 07 9005 – Joint Sealers.
   j. Section 31 –
   k. Section 31 -

2) **Sheets:**
   a. A101 – New Site Plan/Roof Plan.
   b. A103 – New Floor Plan.
   c. A301 – Exterior Elevations

ALTERNATE NO. 3: N/A.

END OF SECTION

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SECTION 01 2600

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **Section Includes: Administrative** and procedural requirements for handling and processing contract modifications as follows:

1. Minor Changes in the Work
2. Change Order Proposal requests.
3. Construction Change Directives.
4. Change Order Procedures.

B. Related Sections:

1. Document – 00 7200General Conditions.
2. Section 01 2900 - Payment Procedures: Administrative procedures governing applications for payment.
3. Section 01 3200 - Construction Progress Documentation: Contractor's construction schedule.
4. Section 01 6300 - Product Substitution Procedures: Administrative procedures for handling requests for product substitutions after award of the Contract.

1.3 MINOR CHANGES IN THE WORK

A. **Supplemental instructions:** In accordance with General Conditions - Paragraph 7.4, the Architect will issue supplemental instructions, in writing, authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time.

1.4 CHANGE ORDER PROPOSAL REQUESTS

A. **General:** Provisions for Change Orders are specified in General Conditions - Paragraph 7.2.

B. **Work Change Proposal Request (WCPR):** Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.

1. Proposal requests issued by the Architect are for information only. Do not consider them an instruction either to stop work in progress, or to execute the proposed change.
2. Unless otherwise indicated in the proposal request, within 10 calendar days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost to execute the proposed change. Include an itemized list of work to be added or deleted with labor and material unit costs including subcontracts. If requested, substantiate costs and quantities. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
3. State the effect the proposed change in the Work will have on the Contract Time.

C. **Contractor Initiated Proposal Requests:** When latent or other unforeseen conditions require modifications to the Contract, or when the Contractor considers a change may benefit the Owner by expediting construction, the Contractor may propose changes by submitting a request for a change to the Architect.
   1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
   2. Include an itemized list of work to be added or deleted with labor and material unit costs. When requested, substantiate costs and quantities. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   3. Comply with requirements of "Section 01 6300 - Product Substitution Procedures" if the proposed change in the Work involves the substitution of one product or system for a product or system specified.

D. **Authorization to Proceed with Change:** When the Contractor and the Architect are in agreement regarding adjustment to the Contract Sum and/or Contract Time resulting from a proposed change in the Work, the Architect will prepare a formal Change Order fully describing the change and specifying any adjustment to the Contract Sum and/or Contract Time. This Change Order shall be signed by the Architect, the Owner, and the Contractor and shall become part of the Contract Documents when signed by all three.

1.5 CONSTRUCTION CHANGE DIRECTIVES

A. **Construction Change Directives:** When the Owner determines it is in the best interest of progress of the work, or when the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal, the Owner may issue a Change Directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. The Construction Change Directive will contain a complete description of the change in the Work and designate the method to be followed to determine change in the Contract Sum and/or Contract Time.

B. **Documentation:** If the Construction Change Directive so orders, the Contractor shall maintain detailed records of workers' time and material used in performing the work required by the Construction Change Directive.
   1. After completion of the change, the Contractor shall submit an itemized account and supporting data, including subcontract breakdowns, necessary to substantiate cost and time adjustments to the Contract and permit preparation of a Change Order.

1.6 CHANGE ORDER PROCEDURES

A. **Change Order Form:** Upon the Owner's approval of a Work Change Proposal Request, Contractor Initiated Proposal Request, or Construction Change Directive, the Architect will issue a Change Order for signatures of the Owner and Contractor on AIA Form G 701, as provided in the Conditions of the Contract.

B. **Time Extensions:** Extension of Contract Time, whether or not related to a change in Contract Sum will be authorized By Change Order.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 2900

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **Section Includes:** Administrative and procedural requirements governing the Contractor's Applications for Payment.

B. Related Sections:
1. Section 01 3100 - Project Management and Coordination.
2. Section 01 3119 - Project Meetings.
3. Section 01 3200 - Construction Progress Documentation: Contractor’s construction schedule.
4. Section 01 7700 - Closeout Procedures.

1.3 SCHEDULE OF VALUES

A. **General:** Submit a Schedule of Values as required by General and Supplementary Conditions. Coordinate preparation of the Schedule of Values with other administrative schedules and forms, including:
1. Contractor's construction schedule (Section 01 3200).
2. List of subcontractors and major suppliers (General Conditions).
3. Products list (Section 01 3300).
4. Schedule of submittals (Section 01 3300).

B. **Submittal Date:** Submit the Schedule of Values to the Architect at the Pre-Construction Conference specified in Section 01 3119.

C. **Format and Content:** Prepare the Schedule of Values on AIA Document G703, using columns A, B, and C. Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.
1. Content: Indicate the following for each item listed:
   a. Related Specification Section number and name.
   b. Quantity of work (number of units, sq. ft., etc.).
   c. Dollar value to nearest whole dollar, adjusted to equal total Contract Amount.
2. Job Overhead Costs: At the Contractor's option, administrative costs, superintendence, temporary facilities and other major cost items that are not directly related to cost of actual work in place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense

1.4 APPLICATIONS FOR PAYMENT

A. **Payment Application Requirements:** In accordance with General and Supplementary Conditions, submit monthly Application for Payment with required supporting data.
1. General: Each Application for Payment shall be consistent with the Schedule of Values and with previous applications and payments as certified by the Architect and paid by the Owner.
2. Notarization: Each Application for Payment shall be notarized.

3. The Contractor shall submit monthly updates of the project schedule with each application for payment. Owner's obligation to make payment is contingent upon Contractor's compliance with this requirement.
4. Special Requirements: The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

B. Payment Times: Progress payments shall be submitted to the Architect no later than the 26th day of the month. The period covered by each Application for Payment is one month ending on the 25th day of the month.

C. Payment Application Forms: Use AIA Document G 702 and Continuation Sheets G 703 as the form for Application for Payment.

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. Entries shall match data on the Schedule of Values and current Contractor's Construction Schedule.
2. Include as additional line items amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

E. Transmittal: Submit original and 3 executed copies of each Application for Payment to the Architect by means ensuring receipt within 24 hours.
1. Architect will transmit original certification to the Owner, one copy with certification to Contractor. Architect will retain one copy for records. Resident Project Representative will retain one copy.

F. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
1. List of subcontractors and major suppliers (General Conditions).
2. Schedule of Values (Section 01 2900).
3. Contractor's Construction Schedule (Section 01 3200).
4. Submittal Schedule (Section 01 3300).
5. List of Contractor's staff assignments (Section 01 3100).
6. Copies of building permits (General Conditions).
7. Copies of authorizations and licenses from governing authorities for performance of the Work (General Conditions).
8. Certificates of insurance and insurance policies (General Conditions).

G. Application for Payment at Substantial Completion: Following issuance of the AIA Document G704-2000 Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Beneficial Occupancy Forms issued previously for Owner partial occupancy of designated portions of the Work.
1. Administrative actions and submittals that shall proceed or coincide with this application are specified in Section 01 7700.
2. In the Application for Payment that first follows the date of Substantial Completion, show 100 percent completion for the portion of the Work claimed as substantially complete.
   a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

H. Final Payment Application: Administrative actions and submittals which must precede or coincide with the final Application for Payment are specified in "Section 01 7700 - Closeout Procedures".

1.5 MOBILIZATION / DEMOBILIZATION

A. Partial payments for Mobilization/Demobilization will be divided into five (5) payments being made to spread the costs over the duration of the project. No price adjustment will be made for this due to changes and/or extensions of time and any increased mobilization cost incurred by the Contractor due to any additional work occasioned by such changes.

B. Partial payments for mobilization shall be made in accordance with the schedule of Table 1150-1, based on the percent earned of original total contract amount (less the Line Item for Mobilization/Demobilization), for a total amount equal to the line item for Mobilization / Demobilization.

Table 1150 – 1
Mobilization/Demobilization Payment

Percent of Total Contract Amount Earned (Excluding the Line Item for Mobilization/Demobilization)	Allowable Percent of the Lump Sum Price for Mobilization/Demobilization
1st Partial Estimate	25% of Line Item Amount
10% of Contract Amount	50% of Line Item Amount
25% of Contract Amount	75% of Line Item Amount
50% of Contract Amount	85% of Line Item Amount
100% (at Substantial Completion)	100% of Line Item Amount

If the Contract is cancelled by the Owner, the Contractor will be paid for the actual cost for mobilization at the time of cancellation, which said cost shall not exceed the total amount bid under this item.

Nothing herein shall be construed to limit or preclude partial payment otherwise provided by the Contract.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 3100

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **This Section includes:** Requirements for project coordination include, but not necessarily limited to:

1. Construction activities.
2. Submittals.
3. Requests for Information (RFIs).
4. General installation provisions.
5. Cleaning and protection.

B. Related Sections include:

1. Document - General Conditions.
2. Section 01 1100 - Summary: Required special coordination related to other contractors and simultaneous use and occupancy of the adjacent buildings.
3. Document 01 3100.13 –Request for Information Form.
4. Section 01 3200 - Construction Progress Documentation: Contractor's Construction Schedule.
5. Section 01 6000 - Product Requirements: Coordinating general installation.
6. Section 01 7700 - Closeout Procedures: Coordinating Contract closeout.

1.3 CONSTRUCTION ACTIVITIES

A. **Coordination:** Coordinate and schedule activities (including submittals, testing, and preparations) to assure efficient and orderly installation of each part of the Work. See additional requirements in “Section 01 3200 – Construction Progress Documentation.”

1. Sequence activities to obtain the best installation and in-place performance.
2. Coordinate installation of components to assure adequate accessibility for installation, maintenance, service and repair.
3. Make necessary provisions for items scheduled for later installation under the Contract and by separate contractors.
4. Schedule product deliveries to assure continuity and proper sequence of operations, without delay and interruptions.
5. Verify that equipment items are suitable for available mechanical and electrical systems.

B. **Communications:** Where necessary, distribute instructions for coordination.

1. Prepare and issue memoranda for the Owner and separate contractors where coordination of their work is required.

C. **Administrative Procedures:** Coordinate administrative activities with

construction to avoid delays and assure orderly progress of the Work. Such activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Project closeout activities.

1.4 SUBMITTALS

A. Staff Names: Within 15 days after Notice to Proceed, submit a list of Project staff assignments, with individual names, their assignments, telephone numbers and mailing addresses.

B. Coordination Drawings: Prepare and submit Coordination Drawings for installation of products and materials.

1. Show the relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. Comply with requirements contained in "Section 01 3200 - Construction Project Documentation".

1.5 REQUESTS FOR INFORMATION (RFI) DOCUMENT 01 3100.13

A. Coordination: All requests for information generated by subcontractors, vendors, etc. shall be submitted to Contractor for investigation and response.

1. If, in the opinion of the Contractor, the requested information requires an interpretation or decision by the Architect, the Contractor shall submit a request for information (RFI) to the Architect.

B. RFI Form: All requests for information shall be submitted to the Architect on the form included at the end of this Section. No other forms will be accepted.

1. All applicable spaces on the RFI form shall be filled-out.

C. Response: Architect will render a response within 15 days of receipt of the completed RFI form.

1. Incomplete RFIs will be returned "without action" for resubmittal.
2. RFIs that do not require an interpretation of the Contract Documents for the execution of the Work will be returned "Not Applicable."
3. Commencement of the Work in accordance with the Architect's RFI response shall indicate Contractor's acknowledgment that there will be no change in the Contract Sum or Contract Time.

D. RFI Logs: Contractor shall prepare and maintain a log of RFIs containing the following:

1. Project name and number.
2. Contractor name, address, telephone and fax number.
3. Spread sheet type categories for RFI number, company/contractor initiating RFI, date issued, date response requested, date response received.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed.

Do not proceed until unsatisfactory conditions have been corrected.

B. **Visual Effects:** Provide uniform joint width in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

3.2 CLEANING AND PROTECTION

A. **During Handling and Installation:** Clean and protect construction in progress and adjoining materials in place.

1. Apply protective covering where necessary to ensure protection from damage or deterioration at Substantial Completion.
2. Clean and maintain completed construction through the remainder of the construction period.

B. **Limiting Exposures:** Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to excessive loading, damaging temperature and humidity extremes, staining, contact between incompatible materials, and similar harmful and deteriorating exposure during the construction period.

C. **Repair and Replacement:** If any parts of the construction are deteriorated, become damaged, develop defects, or are otherwise not in compliance with requirements of the Contract, they shall be cleaned, restored to proper condition, repaired acceptably, or replaced with new products prior to requesting Architect's inspection for Substantial Completion or Final Completion.

END OF SECTION

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DOCUMENT 01 3100.13 -REQUEST FOR INFORMATION (RFI)

From: _____ **Date:** _____ **RFI No:** _____

Cc: _____

To: Sizeler Thompson Brown Architects
Regional Design Group, LLC
300 Lafayette Street, Suite 200
New Orleans, La 70130

504-523-6472 Fax 504-529-1181

Reference: Spec Section _____
Drawings: _____

Attachment: ☐ Yes ☐ No

Attn: _____ **Date Response Requested:** _____

Subject: _____

Question: _____

Proposed Solution: _____

Signed: _____

P.O.R. Response: _____

Signed: _____ **Date:** _____

NOTE: This reply is not an authorization to proceed with work involving additional cost, time or both. If any reply requires a change to the Contract Documents, a Change Order, Construction Change Directive or a Minor Change in the work must be executed in accordance with the Contract Documents.

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SECTION 01 3119

PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **This Section includes:** Administrative and procedural requirements for project meetings, including, but not limited to:
1. Procedures.
2. Pre-construction conference.
3. Preinstallation conferences.
4. Progress meetings.
5. Called meetings.

B. Related Sections include:
1. Section 01 3100 - Project Management and Coordination: Coordinating Project meetings with other construction activities.
2. Section 01 3200 - Construction Progress Documentation: Contractor's Construction Schedule.

1.3 PROCEDURES

A. **General:** Requirements of this Section amplify and do not modify provisions of the General and Supplementary Conditions. This Section specifies administrative and procedural requirements for Project meetings.

B. **Contractor's Responsibility:** Project meetings are administrative activities to facilitate the Contractor's direction of the Work. As such, it is the responsibility of the Contractor to implement understandings reached during meetings, unless otherwise stated.

C. **Location:** Unless otherwise agreed in advance, hold meetings at the Project site.

D. **Pre-Construction Conference:** The Architect will keep minutes of meeting and promptly distribute copies to the Owner, and the Contractor. The Contractor shall distribute minutes to Subcontractors, other attendees and interested parties.

E. **All Other Project/Construction Meetings:** The Contractor will keep minutes of meetings and promptly distribute copies to the Owner, the Architect and other attendees and interested parties.

F. **Attendance:** Contractor shall require attendance at meetings of Owner, General Contractor and Architect. The Architect will attend in the capacity of the Owner's representative and interpreter of Contract requirements.

G. **Additional Meetings:** The Contractor shall arrange for meetings, in addition to those specified in this Section, as necessary for the performance of the Work according to the Contractor's schedule, or as instructed by the Architect at the request of the Owner.

1.4 PRE-CONSTRUCTION CONFERENCE

A. General: After notification that the Contract has been executed, the Architect shall arrange with the Owner, and Contractor, and conduct a Pre-Construction Conference to be held at the Project site. The Contractor shall be responsible to see that his principal subcontractors are in attendance and shall furnish to the Architect, Owner, and the following:

1. Schedule of Values.
2. List of subcontractors and material suppliers.
3. Contractor's Construction Schedule.
4. Documentation, qualification data and certificates as required by Owner and/or Architect.

B. Attendees: The Owner, Architect and Architect's consultants, the General Contractor and its superintendent, and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.

C. Minimum Agenda: Distribute data on, and discuss:

1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, material suppliers, and Architect.
2. Channels and procedures for communications.
3. Construction schedule, including sequence of critical Work.
4. Contract Documents, including distribution of required copies of original Documents and Revisions; Owner's acceptance/rejection of Alternates.
5. Processing of Shop Drawings and other data submitted to Architect for review.
6. Processing for field decisions and Change Orders.
7. Rules and regulations governing performance of Work.
8. Security.
9. Quality control.
10. Housekeeping.
11. Equipment deliveries and priorities.
12. Parking availability.
13. Office, work, and storage areas.
14. Use of premises.
15. Preparation of Record Documents.
16. Working hours.
17. Policy for Owner initiated delay days.
18. Mechanical systems – testing, adjusting, and balancing.

1.5 PRE-INSTALLATION CONFERENCES

A. Requirements: The Contractor shall arrange and conduct a preinstallation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Owner and Architect of scheduled meeting dates.

B. Purpose: Review the progress of other construction activities and preparations for the particular activity under consideration at each preinstallation conference, including requirements for:

1. Contract Documents.
2. Options.
3. Related Change Orders.
4. Purchases.
5. Deliveries.
6. Shop Drawings, Product Data and quality control samples.
7. Possible conflicts.
8. Compatibility problems.
9. Time schedules.
10. Weather limitations.
11. Manufacturer's recommendations.
12. Compatibility of materials.
13. Acceptability of substrates.
14. Temporary facilities.
15. Space and access limitations.
16. Governing regulations.
17. Safety.
18. Inspection and testing requirements.
19. Required performance results.
20. Recording requirements.
21. Protection.

C. Reporting: Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.

D. Problems: Do not proceed with affected work if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

1.6 PROGRESS MEETINGS

A. Requirements: The Contractor shall schedule and conduct progress meetings at regular monthly intervals, unless otherwise scheduled during construction.

B. Attendees: The Owner, Architect, and Contractor shall meet and review the current status and future expected progress of the project.

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

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine status of each activity in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how work behind schedule will be expedited; secure commitments from parties involved to do so. Discuss need for schedule revisions to ensure that current and subsequent activities will be completed within the Contract Time.
2. Review the present and future needs of the contractor, including such items as:
   a. Coordination requirements

b. Submittals
c. Open RFI's
d. Time
e. Sequences
f. Deliveries
g. Off-site fabrication problems
h. Access
i. Site utilization
j. Temporary facilities and services
k. Hours of Work
l. Safety
m. Housekeeping
n. Quality and Work standards
o. Change Orders
p. Documentation of information for payment requests

D. Reporting: After each progress meeting date, the Contractor shall send copies of meeting minutes to the Owner, the Architect and to other parties present and to other parties who should have been present.

1. Action: Responsibility for action and date for completing action shall be indicated for each item requiring resolution.

E. Schedule Updating: The Contractor shall revise the construction schedule prior to each progress meeting where revisions to the Schedule have been made or recognized. The Contractor shall issue the revised Schedule as specified in Section 01 3200.

1.7 CALLED MEETINGS

A. Called meetings may be scheduled in addition to regularly scheduled Progress Meetings. All applicable personnel will be required to attend.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 3200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. See Division 01 Section "Payment Procedures" for submitting the Schedule of Values.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

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

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

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

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

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

3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

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

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

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

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

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

1.4 SUBMITTALS

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

B. Preliminary Network Diagram: Submit two (2) opaque copies, large enough to show entire network for entire construction period. Show logic ties for activities.

C. Contractor's Construction Schedule: Submit two (2) opaque copies of initial schedule, large enough to show entire schedule for entire construction period.
   1. Submit an electronic copy of schedule, using software indicated, on CD-R, and labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date on label.

D. CPM Reports: Concurrent with CPM schedule, submit two (2) copies of each of the following computer-generated reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
   1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
   2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
   3. Total Float Report: List of all activities sorted in ascending order of total float.

E. Daily Construction Reports: Submit two copies at monthly intervals.

F. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

1.5 SUBMISSION AND REVIEW

A. Preliminary Meeting: Participate in preliminary meeting to discuss proposed schedule, requirements of this Section prior to submission of network.

B. Proposed Plan: Submit a schedule for the first 180 days of the work within 14 days of Contract Award. Submit complete schedule within 35 calendar days after Contract Award.

C. Review and Evaluation: Contractor participates in review, evaluation of proposed plan and analysis by Architect and the Owner. Revisions necessary as a result of review resubmittal for acceptance within 10 calendar days after meeting. Accepted schedule to be used for planning, organizing, directing work, reporting progress and requesting payment for work accomplished.

D. Monthly Reports: Submit monthly report of actual construction progress by updating required sorts, time scaled logic diagram. Initially and monthly thereafter, produce projected report of scheduled activities to be started, in process or completed during upcoming reporting period, sorted by early start. At end of reporting period, Contractor shall make entries on preceding Look-Ahead Report to show actual progress. As a minimum, following action will be accomplished:
   1. Identify activities started and completed during previous period.
   2. Show estimated duration (in work days) to complete each activity started but not completed.
   3. Indicate percentage of cost payable for each activity.
   4. Reflect changes in network diagram.
   5. Show conformed modifications, pending proposed changes on update report. Produce, from marked-up Look-Ahead Report, updated required sorts for project and use accumulated cost for completed and partially completed activities as basis for requesting progress payments. Contract status evaluated on basis of relative float on critical path at time of updating with negative relative float indicating contract is behind schedule and positive relative float indicating status ahead of schedule. (Relative float is the current status of an activity in relation to approved schedule completion date.)

1.6 COORDINATION

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

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
   1. Secure time commitments for performing critical elements of the Work from parties involved.
   2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

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

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
   1. Activity Duration: Define activities so no activity is longer than 14 days, unless specifically allowed by Architect.
   2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
   3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
   4. Startup and Testing Time: Include not less than 15-30 days for startup and testing.
   5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
   1. 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.
      e. Use of premises restrictions.
      f. Provisions for future construction.
      g. Seasonal variations.
      h. Environmental control.
   2. 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.
l. Startup and placement into final use and operation.

3. 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.

D. Milestones: Milestones are a key or critical point in time for reference or measurement. The following MANDATORY milestone topics should be including in your critical path project schedule as a condition of acceptance of the project schedule. Include milestones indicated below but not limited to the following:
   1. Notice to Proceed
   2. Temporary utilities
   3. Exterior façade
   4. Plumbing rough-in
   5. Electrical rough-in
   6. Mechanical rough-in
   7. Substantial Completion
   8. Final Completion

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within **30** days of date established for the **Notice to Proceed.** Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
   1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

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

B. Preliminary Network Diagram: Submit diagram within **30** days of date established for the **Notice of Award**. Outline significant construction activities for the first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule Preparation: Prepare Contractor's Construction Schedule using a computerized, cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
   1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 5 days before the preconstruction meeting.
      a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.
   2. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
   3. Use "one workday" as the unit of time. Include list of nonworking days and holidays incorporated into the schedule.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.
   1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
      a. Preparation and processing of submittals.
      b. Mobilization and demobilization.
      c. Purchase of materials.
      d. Delivery.
      e. Fabrication.
      f. Utility interruptions.
      g. Installation.
      h. Testing.
   2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
   3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
   4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
      a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

E. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:
   1. Contractor or subcontractor and the Work or activity.
   2. Description of activity.
   3. Principal events of activity.
   4. Immediate preceding and succeeding activities.
   5. Early and late start dates.
   6. Early and late finish dates.
   7. Activity duration in workdays.

8. Total float or slack time.
9. Average size of workforce.

F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

2.5 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
2. Equipment at Project site.
3. Material deliveries.
4. High and low temperatures and general weather conditions.
5. Accidents.
6. Meetings and significant decisions.
7. Stoppages, delays, shortages, and losses.
8. Meter readings and similar recordings.
9. Emergency procedures.
10. Orders and requests of authorities having jurisdiction.
11. Change Orders received and implemented.
12. Construction Change Directives received.
13. Services connected and disconnected.
14. Equipment or system tests and startups.
15. Partial Completions and occupancies.

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

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule 3 days before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.

3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms and temporary field offices.
   2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 3233

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for the following:
1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs.

B. Related Sections:
1. Division 01 "Submittal Procedures" for submitting photographic documentation.
2. Division 01 "Payment Procedures" for submittal of photos with each pay application.
3. Division 01 "Closeout Procedures" for submitting photographs as Project Record Documents at Project closeout.
4. Division 31 “Driven Piles”, “Prestressed Concrete Piling”, Augered Cast-in-Place Piles” for preconstruction photographic requirements.

1.3 SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same label information as corresponding set of photographs.

B. Preconstruction and Construction Photographs: Submit one print of each photographic view within seven days of taking photographs.
1. Digital Images: Submit a complete set of digital image electronic files with each submittal of prints on CD-ROM. Identify electronic media with date photographs were taken, along with "date imprint" visible on each photographic image to verify date of recording. Submit images that have same aspect ratio as the sensor, uncropped.
2. Identification: On back of each print, provide an applied label or rubber-stamped impression with the following information:
   a. Name of Project.
   b. Name and address of photographer.
   c. Name of Architect.
   d. Name of Contractor.
   e. Date photograph was taken, along with "date imprint" visible on each photographic image.

f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
g. Unique sequential identifier.

C. Photographer Qualifications: Provide photographer qualification.

1.4 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.5 COORDINATION

A. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to Project site and use of temporary facilities, including temporary lighting required to produce clear, well-lit photographs without obscuring shadows.

1.6 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8.0 megapixels and at an image resolution of not less than 1024 by 768 pixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
1. Date and Time: Include date and time in filename for each image.
2. Field Office Images: Maintain one set of images on CD-ROM in the field office at Project site, available at all times for reference. Identify images same as for those submitted to Architect.

C. Preconstruction Photographs: Inventory and record the condition of adjacent structures, (2 block radius) underground utilities, and other construction. Provide photographs of conditions that might be misconstrued as damage caused by pile driving. Photographs must be of quality and detail to clearly document all pre-existing conditions of the adjacent structures with respect to structural foundations, building cracking/shifting, etc. Contractor is required to obtain adjacent property owner's authorization to photograph exterior and interior pre-existing conditions. Exterior photographs must be documented with vegetation and other visual barriers avoided. Photographs to be taken behind vegetation and barriers with appropriate detail and lighting control to view conditions clearly.

1. All photographs must have "date imprint" visible on photographic image to verify date of recording.
2. Flag construction limits before taking construction photographs.
3. Take a minimum of eight photographs to show existing conditions adjacent to property before starting the Work.
4. Take a minimum of eight photographs of existing conditions either on or adjoining property to accurately record physical conditions at start of construction.
   Take additional photographs as required to record settlement or cracking of adjacent structures, pavements and improvements.
5. Inventory and record the condition of adjacent structures, (a minimum of 2 block radius) underground utilities and other construction. Provide photographs of conditions that might be misconstrued as damage caused by pile driving. Photographs must be of quality and detail to clearly document all pre-existing conditions of the adjacent structures with respect to structural foundations, building cracking/shifting, etc. Contractor is required to obtain adjacent property owner's authorization to photograph exterior and interior pre-existing conditions. Exterior photographs must be documented with vegetation and other visual barriers avoided. Photographs to be taken behind vegetation and barriers with appropriate detail and lighting control to view conditions clearly.

D. Periodic Construction Photographs: Take twelve (12) color, digital photographs monthly, coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

1. Show status of construction and progress since last photographs were taken.
2. During each of the following construction phases, take shots from same vantage point each time to create a time-lapse sequence as follows:
   a. Commencement of the Work, through completion of subgrade construction.
   b. Above-grade structural framing.
   c. Exterior building enclosure.
   d. Interior Work, through date of Substantial Completion.

E. Final Completion Construction Photographs: Take twenty (20) color photographs after date of Substantial Completion of submission as project record documents. Architect will inform photographer of desired vantage points.

1. Do not include date stamp.

F. Additional Photographs: Architect may issue requests for additional photographs, in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum.

1. Three days' notice will be given, where feasible.
2. In emergency situations, take additional photographs within 24 hours of request.
3. Circumstances that could require additional photographs include, but are not limited to, the following:
   a. Special events planned at Project site.
   b. Immediate follow-up when on-site events result in construction damage or losses.
   c. Photographs to be taken at fabrication locations away from Project site.
   d. Substantial Completion of a major phase or component of the Work.
   e. Extra record photographs at time of final acceptance.
   f. Owner's request for special publicity photographs.

END OF SECTION

SECTION 01 3300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Subcontractors/materials list.
2. Submittal schedule.
3. Shop Drawings, Product Data, and Samples.

B. Related Sections:
1. Section 01 2900 - Payment Procedures: Applications for Payment and Schedule of Values.
2. Section 01 3100 – Project Management and Coordination: Coordination Drawings.
3. Section 01 3119 - Project Meetings.
4. Section 01 3200 - Construction Progress Documentation: Contractor's Construction Schedule.
5. Section 01 3310 - Request for Electronic Data.
6. Section 01 4200- References: Permits.
7. Section 01 7700 - Closeout Procedures: Warranty and manufacturer's submittals and closeout submittals.

1.3 SUBCONTRACTORS/MATERIALS LIST

A. **General:** Promptly after Contract award, but not later than the Pre-Construction Conference specified in “Section 01 3119 - Project Meetings,” submit a list of proposed subcontractors and materials. Include suppliers of items specially fabricated for the Project, such as architectural woodwork.
1. Provide the names and addresses of all subcontractors and special fabricators. Indicate the portions of work to be performed by each, and a preliminary value of the work of each.
2. Identify major standard materials and equipment by manufacturer's name, brand and model.
3. Subcontractors and suppliers named in the subcontractors/materials list will be approved or disapproved in accordance with the conditions of the Contract.

1.4 SUBMITTAL SCHEDULE

A. **Requirements:** After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals in accordance with General Conditions. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule.
1. Schedule shall be an integral component of the Project Management Software described in “Section 01 3200 - Construction Progress Documentation”.

B. Preparation: Prepare the schedule in chronological order. Provide the following information:

1. Description of work and Section number.
2. Scheduled date for the first submittal of each item.
3. Submittal category (Shop Drawing, Product Data or Sample).
4. Scheduled date for Architect's final release or approval.

C. 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. Revise and reissue the schedule after each meeting or activity, where revisions have been recognized or made.

1.5 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. General: Prior to submission to Architect, all Shop Drawings, brochures, Samples and other submissions shall be approved by the Contractor for compliance with the Contract Documents and shall be checked for quantity, size and dimensions by Contractor's personnel. Architect will answer questions raised by the Contractor or subcontractors and will make all determinations regarding quality of materials and equipment, arrangement, and color selections but will not be responsible for quantity, size or dimensional errors. In cases of omissions and obvious error, and in cases of conflict either between details on Contract drawings, or Specifications such questions shall be called to Architect's attention, and the Architect shall give prompt answers to such questions.

B. 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.

C. 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.

1. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
2. Allow not less than 15 working days for initial review. Allow additional time if submittal is voluminous or if processing must be delayed to permit coordination with subsequent submittals. The Architect will advise the Contractor when a submittal being processed must be delayed for coordination or because of volume of material to be reviewed.
3. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
4. If resubmittal is necessary, process the same as the initial submittal. Identify in writing any changes, which have been made other than those directed by markings by the Contractor, Architect, or Architect's consultant on the prior submittal.
5. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 working days for initial review of each submittal.
6. Allow not less than 15 working days for processing each resubmittal.
7. 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.
8. Perform work for which Architect's approval of Shop Drawings, Product Data and Samples is required only with the use of such items, which have been approved.

D. Submittal Preparation: Identify each submittal with a permanent label, title block, or contractor's stamp. Include the following information:

1. Project name.
2. Date.
3. Name of Architect, Contractor and subcontractor.
4. Name of supplier and manufacturer, as applicable.
5. Number and title of appropriate Specification Section.
6. Drawing number and detail references, as appropriate.

E. Contractor's Review: The Contractor shall approve submittals as required by General Conditions prior to submission to the Architect, and shall stamp and initial each submittal as evidence of Contractor's review and approval. Submittals received without the Contractor's executed approval stamp will be returned by the Architect without action.

F. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a cover letter or transmittal form. Submittals received from sources other than the Contractor will be returned without action.

1. On the letter or transmittal record relevant information, requests for data, and deviations from Contract Document requirements, including minor variations and limitations.
2. Include Contractor's certification that information complies with Contract Document requirements.

G. Submittals for Architect's Information: Where Specifications require submittals “for record purposes”, “for information only”, or similar wording, submit two copies of required items. Such submittals will not be stamped or returned by the Architect.

H. Architect's Action: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked to indicate the action taken.

1. Allow 4-inch by 6-inch space to accommodate stamp.
2. Except for submittals for record, information or similar purposes, the Architect will review each submittal, mark to indicate action taken, and return promptly.
3. Architect's review and action on any submittal does not relieve Contractor from responsibility for compliance with Contract Documents requirements, unless deviation is approved in writing.

1.6 SHOP DRAWINGS

A. Format: 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. Use of Architect's drawings or computer generated information as Shop Drawings is expressly prohibited. Standard information prepared without specific reference to the Project is not considered Shop 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.

B. Submittal Copies: Submit seven (7) copies plus additional copies necessary for Contractor’s distribution. The Architect will retain two copies, and will return the other marked with action taken and corrections or modifications required.

C. Distribution: Contractor shall make necessary distribution copies from stamped and reviewed reproducible print. Distribute approved Shop Drawing prints as follows:

1. Contractor's file.
2. Job site file.
3. Record documents file.
4. Subcontractors, suppliers, fabricators and installers, as needed.

D. Coordination Drawings: Special Shop Drawings to show the relationship of construction elements that require coordination during fabrication and installation to fit in the space available and to function as intended.

1. Preparation of coordination drawings is specified in “Section 01 3100 - Project Management and Coordination” and may include components previously shown in detail on Shop Drawings or Product Data.
2. Coordination drawings may be prepared by the Contractor, or by an entity responsible for one of the elements involved, or by an entity engaged by the Contractor for the purpose.

1.7 PRODUCT DATA

A. Format: Collect Product Data into a single submittal for each system and element of construction. Product Data includes printed information such as manufacturer's product descriptions and installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves.

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.
2. Do not submit Product Data until compliance with the Contract Documents has been verified.

B. Submittal Copies: Submit seven copies plus additional copies necessary for Contractor's distribution. The Architect will retain two copies, and will return the others marked with action taken and corrections or modifications required.

C. Distribution: Distribute copies of final Product Data same as specified for Shop Drawings.

1.8 SAMPLES

A. Format: Submit physical Samples which are identical to the material or product proposed, for visual review of kind, color, pattern, and texture, and for evaluation of the actual component as delivered and installed.

1. Architect will not review Samples for requirements such as composition, strength, material class or grade, and similar qualities not apparent upon visual examination.
2. Submit multiple units (not less than 2), to show approximate limits of expected variations in color, pattern, texture or other characteristics.
3. Refer to other Specification Sections for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.

B. Preliminary Samples: 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.

1. Remove or clearly identify choices, which are "extra cost" selections with respect to the Contract requirements.
2. Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.

C. Submittal Copies: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit three (3) sets; one will be returned marked with the action taken. Maintain approved Samples at the Project site, for quality comparisons throughout the course of construction.

D. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work.

E. Field Samples: Field Samples (mock-ups) 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.

1. Where required, Field Samples are specified in individual specification Sections.
2. Use confirming letters or transmittal forms to provide a record of activity.

F. Permanent Work: Items incorporated in the Work shall match approved Samples.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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DOCUMENT 01 3310 - REQUEST FOR ELECTRONIC DATA

To: Sizeler Thompson Brown Architects
300 Lafayette Street, Suite 200
New Orleans, LA 70130

Attention: _____

From: _____
Name

_____
Title

_____
Company (General Contractor Only)

(Noted below as "Contractor")

Date of Request: _____

Project Title: _____

Sheets Being Requested:

_____

_____

The above data sheets have been requested by the General Contractor in electronic format for its convenience and use in the preparation of shop drawings related to the subject project. The General Contractor agrees to pay the Architect a "service fee" charge of $150.00 per drawing and the use of these electronic files are subject to the following terms and conditions:

1. Sizeler Thompson Brown Architects' files are compatible with AutoCAD 2009. Sizeler Thompson Brown Architects does not make any representation that these files are compatible with the Contractor's hardware or software beyond the specified release of the referenced software.

2. Data contained on these electronic files are considered a part of Sizeler Thompson Brown Architects' Instruments of Service and shall not be used by the Contractor, or anyone else receiving this data through or from the Contractor, for any purpose other than as a convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by the Contractor or by others will be at the Contractor's sole risk and without liability or legal exposure to Sizeler Thompson Brown Architects its officers, directors, employees, agents or subconsultants. To the fullest extent permitted by law, the Contractor agrees not to assert any claim and hereby waives any claim or cause of action of any kind or nature against Sizeler Thompson Brown Architects, its officers, directors, employees, agents or subconsultants which may arise out of or in conjunction with the Contactor's use of these electronic files.

3. To the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless Sizeler Thompson Brown Architects from all claims, damages, losses and expenses, including attorney's fees, arising out of or resulting from Contractor's use or reuse of these electronic files.

4. These electronic files are not construction contract documents. Significant differences may exist between these electronic files and corresponding hard copy construction contract documents due to addenda, change orders or other revisions. Sizeler Thompson Brown Architects makes no representation regarding the accuracy or completeness of the electronic files received. In the event that a conflict arises between the hard copy construction contract documents prepared by and signed and sealed by Sizeler Thompson Brown Architects and the electronic files, the signed and sealed hard copy construction contract documents shall govern. The Contractor is responsible for determining if any conflicts exist. By use of these electronic files, the Contractor is not relieved of his duty to fully comply with the contract documents, including without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate work with that of other contractors for the project.

5. Because of the potential that the information presented on the electronic files can be modified, unintentionally or otherwise, Sizeler Thompson Brown Architects reserves the right to remove all indicia of its authorship, firm identification and/or architectural seal for each electronic display.

6. Under no circumstances shall delivery of the electronic files for use by the Contractor be deemed a sale by Sizeler Thompson Brown Architects and Sizeler Thompson Brown Architects makes no warranties, either expressed or implied, of merchantability and fitness for any particular purpose. In no event shall Sizeler Thompson Brown Architects be liable for any loss of profit or any consequential damages from the use or reuse of these electronic files.

The above represents the agreement between the Contractor and Sizeler Thompson Brown Architects with respect to the use of the subject electronic files.

The General Contractor acknowledges his agreement with the above by signing on the acceptance line below and returning this form, with payment of the service fee charge to the office of Sizeler Thompson Brown Architects.

Enclosed service payment: $_____.00 associated with _____Data Sheets @ $150.00 per sheet

ACCEPTED THIS _____ DAY OF _____, 20____.

_____ _____
Signature Title

END OF DOCUMENT

SECTION 01 4000

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and –control services required by Architect, Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.

C. Design Performed by the Contractor as called for by the Technical Specifications.

1.3 DEFINITIONS

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

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

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to

review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
2. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.

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

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

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

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

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

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

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

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

1.4 REFERENCE STANDARDS

A. Reference Standards – General:

1. Comply with edition of standard in effect as of:
   a. Date of contract documents

2. Compliance with standards which are revised or reissued after that date will not be required unless incorporated into the contract documents by modification.
3. Where applicable codes, laws, or regulations require editions of different dates, obtain instructions from the governing authorities as to which edition is required.

B. The requirements of reference standards are binding on the contractor, just as if they were copied into the contract documents, but no provisions of reference standards shall alter the contractual relationship of the parties to the contract.

1.5 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

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

1.6 ACTION SUBMITTALS

A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
1. Indicate manufacturer and model number of individual components.
2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.7 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan, if required.
2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan.

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

E. Schedule of Tests and Inspections: Prepare a schedule in tabular form and include the following:
1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Enumeration of results required.
7. Number of tests and inspections required.
8. Time schedule or time span for tests and inspections.
9. Number, type, and requirements for obtaining samples.
10. Unique characteristics of each quality-control service.

1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality control procedures similar in nature and extent to those required for Project.
1. Project quality-control manager shall not have other Project responsibilities.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
1. Contractor-performed tests and inspections including subcontractor performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by the Commissioning Authority.

4. Independent testing agencies, whether employed by the Owner or the Contractor, may not change the requirements of the contract documents and may not approve any portion of the work.
5. Employment of testing agencies, by the Contractor or the Owner, shall not relieve the Contractor of his obligation to perform the work in accordance with the contract documents.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.

5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

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

1.10 QUALITY ASSURANCE

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

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

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

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

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

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
   a. Provide test specimens representative of proposed products and construction.
   b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
   c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
   d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
   e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
   f. When testing is complete, remove test specimens, assemblies, and mockups; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect and Commissioning Authority, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
   a. Allow seven days for initial review and each re-review of each mockup.
      1) Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
      2) Demolish and remove mockups when directed unless otherwise indicated.

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

M. Room Mockups: Construct room mockups incorporating required materials and assemblies, finished according to requirements. Provide required lighting and additional lighting where required to enable Architect to evaluate quality of the Work. Provide room mockups of the following rooms:
1. Typical classroom.

1.11 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor’s responsibility: Tests and inspections are Contractor’s responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
   a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
3. Notify testing agencies 5 working days prior to the commencement or completion of work which is to be tested or inspected and confirm at least 24 hours in advance of time when testing or inspecting is to be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in pre-installation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

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

F. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Submit written report of each original test with each retest.
6. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
7. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, Commissioning Authority, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.12 SPECIAL TESTS AND INSPECTIONS

A. Conducted by a qualified special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections and in Statement of Special Inspections prepared for this project, as specified in Division 01 Section “Testing Laboratory Services” and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect, Commissioning Authority, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect and Commissioning Authority with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and re-inspecting corrected work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

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

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

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

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

END OF SECTION

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SECTION 01 4200

REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. General definitions for Specifications and other Contract Documents including the Drawings.
2. Specification format and content explanation.
3. Explanation of Industry Standards.

1.3 DEFINITIONS

A. **General:** Basic Contract definitions are included in the General and Supplementary Conditions.

B. **"Indicated":** Shown, noted, inferred, scheduled and specified on the Drawings and/or in Specifications.

C. **"Regulations":** Laws, statutes, ordinances and lawful orders issued by authorities having jurisdiction.

D. **"Furnish":** Supply and deliver to the project site.

E. **"Install":** Unload, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean and perform similar operations at the project site.

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

G. **"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 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 trades persons of the corresponding generic name.
3. Assigning Specialists: Certain Sections of the Specifications require 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.

H. "Project Site": 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.

I. "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.

1.4 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 48 Division format and the 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.

1.5 INDUSTRY STANDARDS

A. Applicability of Standards: Except where Contract Documents include more stringent or specific requirements, industry standards, which are referenced in the Specifications are made a part of the Contract Documents and have the same force and effect as if bound or copied directly into Contract Documents.

1. Where requirements are expressed in SI (metric) units, it is understood that corresponding metric versions of industry standards, if available (such as ASTM A 36M for steel members or ANSI B18.22M for steel washers) will be the applicable standards.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying 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.

C. **Publication Dates:** Where a date of issue or edition is not specified, comply with standard in effect on the date of Contract Documents.

D. **Conflicting Requirements:** Where compliance with 2 or more standards are 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.

E. **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.

F. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. Generally recognized acronyms or abbreviations are used in the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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SECTION 01 4529

TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Selection and payment.
2. Submittals.
3. Contractor's responsibility.
4. Additional tests.
5. Rejection of materials.

B. Related Sections:
1. General Conditions and Supplementary Conditions for Testing laboratory requirements.
2. Division 01 "Construction Project Documentation: for scheduling of required tests and inspections.
3. Division 01 "Quality Requirements" for quality standards and scheduling requirements of testing and inspection.
4. Division 01 "Closeout Procedures" for Project record documents.

C. Requirements for Testing or Inspection: Specific testing or inspection service requirements are specified in the appropriate Sections of Divisions 2 through 48.

1.3 SELECTION AND PAYMENT

A. Selection and Payment of Testing Laboratory:
1. Owner's Responsibility: The Owner will select and pay for an independent Testing Laboratory of recognized standing for all testing herein indicated in the Contract Documents to be the responsibility of the Owner.
2. Contractor's Responsibility: The Contractor will select and pay for an independent Testing Laboratory of recognized standing for all testing hereinafter specified and/or required in the Contract Documents, unless noted otherwise as the Owner's responsibility.
   a. The Contractor shall pay the Testing Laboratory costs for all tests that indicate nonconformance with the Contract Documents.
3. The contractor is to select the testing lab from Owners list of approved Testing Laboratories and pay for all concrete design mix testing.

1.4 SUBMITTALS

A. The independent testing agency shall submit reports and inspections as specified in Division 01 “Quality Requirements”.

1.5 CONTRACTOR’S RESPONSIBILITY

A. Contractor's Responsibility: Employment of the Laboratory does not relieve the Contractor of responsibility to provide materials and construction in conformance with the Contract Documents. Processing or use of specified materials shall be understood as constituting full acceptance and approval by the Contractor of materials as suitable for the intended purpose, unless previous written exception is taken by the Contractor.

1. Contractor shall provide and maintain a “hot box” for storage and curing of concrete test cylinder on the project site in accordance with the requirements of the selected testing laboratory.

B. Contractor is responsible for testing requirements as stipulated in the contract documents, as listed in each individual specification and as required by authorities having jurisdiction.

C. Vibration monitoring:

1. The contractor shall provide an independent testing laboratory to perform vibration monitoring at locations throughout the project to monitor any vibrations or movements which may be caused by construction activity.
2. The Contractor shall be responsible for staying in close contact with the monitoring technician(s) to insure that the vibrations do not exceed acceptable limits. It shall be the Contractor's responsibility to make sure that a sufficient amount of vibration readings are taken for his use and for any potential claims due to construction.
3. The vibration monitoring shall be conducted by a testing laboratory having the appropriate experience, equipment, and credentials required of this service. All costs for providing vibration monitoring shall be paid by the Contractor to the testing laboratory. There will be no direct payment to the Contractor for this item of work.

1.6 ADDITIONAL TESTS

A. Additional Tests: The Architect and Owner reserve the right to require additional tests to those specified or upon materials not already specified for testing. If such tests disclose noncompliance with the Contract requirements, the Architect and Owner reserve the right to require additional tests at the expense of the Contractor.

1. All retesting of non-compliant materials shall be at the expense of the Contractor.

1.7 REJECTION OF MATERIALS

A. Notification: The Laboratory shall notify the Contractor, or his authorized representative, of any materials or work which are not in full conformance with the Contract Documents and the Architect shall be informed of such notification.

Such nonconforming items shall not be incorporated in the finished work unless changed or corrected.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 5000

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, security and protection facilities, pedestrian and vehicular access and traffic control.

B. Unless indicated to be optional, temporary services and facilities are Contract requirements.

C. Relocate and rearrange temporary services and facilities as necessary for efficient, orderly progress of the work and to accomplish the required construction.

D. Related Sections:
1. Division 01 "Storm Water Pollution Prevention Plan" for the prevention of flooding by runoff of storm water from heavy rains.
2. Division 01 "Temporary Dehumidification, Heating and Cooling".
3. Division 01 "Project's Identification Sign."
4. Division 01 "Field Engineering" for progress cleaning requirements.
5. Division 01 "Closeout Procedures" for final cleaning requirements.
6. Divisions 02 through 48 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.
7. Division 03 "Concrete Paving"
8. Division 07 "Building Insulation"
9. Division 09 "Gypsum Board"
10. Division 31 "Earthwork."
11. Division 31 "Termite Control" for pest control.
12. Division 32 "Detectable Warning Surfaces."

1.3 DEFINITIONS

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

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's, Architect, testing agencies, and authorities having jurisdiction.

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

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

1.5 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel. Submit within 10 days after the effective date of the Notice to Proceed.

B. Implementation and Termination Schedule: Within 10 days after the effective date of the Notice to Proceed with the Contractor’s construction schedule, submit a schedule indicating installation and termination of each temporary utility.

C. Site Utilization Plan: Submit a site utilization plan indicating locations of temporary construction fencing, barricades, temporary buildings, lay-down areas, vehicle circulation, and construction site entrances. Show temporary utility lines and connections. Submit within 10 days of the Notice to Proceed.

D. Traffic Plan: Provide plans, details and the amount of traffic on the road that will occur on the proposed traffic plan indicating routes and alternate routes as necessary.

E. Fire Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

F. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.

1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
3. Indicate sequencing of work that requires water (if applicable) and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

1.6 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
1. New Orleans Parish, regulations and requirements.
2. Building code requirements.
3. Health and Safety regulations.
4. Utility company regulations.
5. Police, fire department and rescue squad rules.
6. Environmental protection regulations.
7. LDEQ; EPA; OHSA; etc, as required.

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

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

1.7 PROJECT CONDITIONS

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

B. Pile Driving: Contractor shall notify Owner of pile driving hours and receive Owner’s approval. Contractor shall comply with all governing codes and ordinances related to pile driving operations.

C. Staging Areas: The Contractor and subcontractors shall locate offices, parking, materials storage, equipment storage, maintenance areas and similar major facilities in permitted areas directed by the Owner.
1. If offsite areas are required in addition to the staging areas allotted on Drawings, the Contractor shall secure and pay for at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. First Aid Supplies: Comply with governing regulations.

B. Pavement: Comply with Division 03 Section "Concrete Paving.”

C. Chain-Link Fencing: Contractor’s Choice, system may be portable. Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide green vision intrusion/wind screen at the entire perimeter.

D. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry."

E. Gypsum Board: A minimum of 5/8-inch thick by 48-inches wide by maximum available lengths; panels with tapered edges as specified in Division 09 Section "Gypsum Board."

F. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively. As specified in Division 07 Section "Building Insulation."

2.2 TEMPORARY FACILITIES

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

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

1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.
2. Conference room of sufficient size to accommodate meetings of 12 individuals, minimum. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square, minimum, tack and marker boards.
3. Drinking water and private toilet.
4. Coffee machine and supplies.
5. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
6. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
7. The General Contractor must provide a dedicated area in the site trailer for storage and maintenance of electronic-based checklist verification equipment system.

2.3 EQUIPMENT

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

B. HVAC Equipment and System: Prior to the use of permanent HVAC system, provide well vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control prior to the use of the Owner’s permanent HVAC system. Provide special care to the permanent system and comply with the following requirements:

1. Permanent HVAC System: Provide filter with MERV of 12-14 at each return air grille in system and replace weekly during the renovations. The filter shall have the following characteristics:
   a. Arrestance: 99 percent.
   b. Efficiency: 80-90 percent.
   c. Types of Filters: Pleated MERV 13 Nordic Pure Filters to comply with LEED

requirements.
   d. Tested Contaminant: Legionella, Humidifier dust, smoke, copier toner, rigid cell filters, face powder, paint pigments, insecticide ducts.
2. Use of gasoline-burning space heaters, open-flame heaters or salamander type heating units are prohibited.
3. Temporary Heating Units: Units shall be listed and labeled for type of fuel consumed, by a testing agency acceptable to authorities having jurisdiction and marked for intended use.
4. At completion of Construction, provide maintenance, including but not limited to the following: cleaning the HVAC equipment, ductwork and replace of filters prior to occupancy.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Follow any direction as indicated on the plans and as designated by Architect. Relocate and modify facilities as required by progress of the Work.

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

C. The Contractor shall provide and maintain construction fences, barricades, warning lights and temporary sidewalks as required by the Department of Public Works and other authorities, in approved locations providing complete protection to the public and to provide security to the premises during the construction period. The Contractor shall provide all necessary precautions to insure pedestrian access to adjacent properties during construction. As required, flashing lights shall be installed at locations required by local authorities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service and prepare for connection to the permanent service for the building.
1. Arrange with utility company, Owner, Owner's Program Manager and Architect for time when service can be interrupted, if necessary, to make connections for the temporary services.
2. Contractor is responsible for providing any temporary heating, cooling or ventilation necessary for the construction operations.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

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

1. Contractor shall provide piping, hoses, backflow preventers, valves and other items necessary to conduct water from connection point to the construction location.
2. Contractor shall supervise use of water to prevent waste and prevent damage to the building and site due to leaking and uncontrolled discharge.
3. Sterilize temporary water piping prior to use.
4. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.

D. Sanitary Facilities: Provide temporary toilets, wash facilities and drinking water for use of construction personnel. Comply with authorities having jurisdiction and health codes for type, quantity, location, operation and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs and obscured from the public view to the greatest extent possible.

1. At a minimum the portable sanitary facilities shall be cleaned, deodorized, and disinfected each day construction is in progress, at the Contractor's expense. If toilets of the chemically tested type are used, at least one toilet will be furnished for each 20 men, in addition to the local jurisdiction and health code requirements. Contractor shall enforce the use of such sanitary facilities by all personnel at the site.
2. Provide toilet tissue, paper towels and similar disposable materials for each facility within construction areas. Provide covered waste containers for disposed material.

E. Heating and Cooling: Provide temporary heating and cooling for the construction activities for curing or drying durations required of the completed installations. Provide the protection of the installed construction by producing a conditioned space. Select heating and cooling equipment that will not have a harmful effect on the completed construction.

F. Ventilation and Humidity Control: Provide temporary ventilation and humidity control for the construction activities for curing or drying durations required of the completed installations. Provide the protection of the installed construction by producing a conditioned space. Select ventilation and humidity control equipment that will not have a harmful effect on the construction. Coordinate ventilation and humidity control requirements to produce the ambient condition required.

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

1. Install electric power service as indicated on the drawings.
2. Contractor shall provide extension cords, wiring, switches, disconnects, fuses, lamps and receptacles, and other items necessary to conduct electricity from connection point to the construction location.
3. Contractor shall supervise use of electricity to prevent waste, to prevent injury and damage to the building due to improper and unsafe use including but not limited to overloading and absence of grounding.

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

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

I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
1. Provide additional telephone lines for the following:
   a. Provide a dedicated telephone line for each facsimile machine and computer in each field office.
2. At each telephone, post a list of important telephone numbers.
   a. Police and fire departments.
   b. Ambulance service.
   c. Contractor's home office.
   d. Architect's office.
   e. Engineer's office.
   f. Owner's office.
   g. Principal subcontractors' field and home offices.
3. Provide superintendent with cellular telephone for use when away from field office.

J. Temporary Exhaust Fans: For construction where dust, dirt, etc. is created or accumulated, fans will be required in each area under construction and run continuously during working hours. Exhaust fan of portable type, shall be exhausted to exterior. Fan shall be minimum 36-inch diameter powered by a 1/3 horsepower motor. Provide wire guard on interior side of units.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30-feet of building lines. Comply with NFPA 241.
2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement, and utilities. Repair and replace any existing site improvements damaged.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Provide temporary and designated areas of parking for construction personnel. Comply with designated areas and the protection of the site.

D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
2. Comply with Division 31 Section "Dewatering."

E. Project Identification and Temporary Signs: Provide project identification and other signs. Install signs where indicated to inform public and individuals seeking entrance to Project. Unauthorized signs are not permitted.
1. Project Identification Sign: Provide as specified in Division 01 Section "Project's Identification Sign".
2. Provide temporary, directional signs for construction personnel and visitors.
3. Maintain and touchup signs so they are legible at all times.

F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction and with Division 01 Section "Field Engineering" for progress cleaning requirements.

G. Lifts and Hoists: Provide equipment necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

H. Temporary Stairs: Until permanent steps are available, provide temporary stairs where ladders are not adequate.

I. Temporary Use of Permanent Stairs and Ramps: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance at Substantial Completion.

J. Sheet Piling: In addition to work specified, provide sheet piling as required. Type, thickness, shoring, bracing and other details shall be the Contractor's sole responsibility and determined by the Contractor as necessary due to excavation depth, soil conditions, rain fall, adjacent traffic and other related factors.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

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

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction by means and methods that comply with the environmental regulations. Minimize possible air, waterway, and subsoil contamination, pollution or other undesirable effects, during the construction duration.
1. Comply with work restrictions specified in Division 01 Section "Summary."

C. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion, discharge of soil-bearing water runoff and airborne dust to the site and adjacent properties and walkways, according to requirements of authorities having jurisdiction. Any erosion and diverging of water is the responsibility of the Contractor. Provide maintenance and fill as required to obtain proper erosion control.

D. Storm Water Control: Comply with authorities having jurisdiction and as specified in Division 01 Section "Storm Water Pollution Prevention Plan." Provide barriers in

and around the excavation and sub-grade construction to prevent flooding by runoff of storm water from heavy rains.

E. Tree and Plant Protection: Install temporary fencing located outside of the tree's drip line to protect trees and vegetation from damage due to the construction operations. Protect tree root systems from damage, flooding, and erosion. Protect all existing trees not in conflict with new construction.

F. Pest Control: Engage pest-control service to provide practices to minimize attraction and harboring of rodents, roaches and other pests. Pest-control services shall perform extermination and control procedures at regular intervals so Project will be free of pests and their residues during the construction duration to Substantial Completion. Obtain extended warranty for Owner. Control operations lawfully, using environmentally safe materials. Coordinate with Division 31 Section "Termite Control."

G. Site Enclosure Fence and Lock-Up: Before the construction operation begins, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except at the entrance gates.
1. Extent of Fence: As required to enclose the entire Project site or portions of the site determined sufficient to accommodate the construction operations.
2. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft and similar violations of security. Maintain security by limiting number of keys and restricting the distribution to authorized personnel. Provide Owner with one set of keys.

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

I. Temporary Enclosures: Provide temporary enclosures for protection of the construction in progress and completed. Protect the construction from exposure, foul weather, other construction operations and similar activities. Provide temporary weathertight enclosure for the building until the building's exterior enclosure is complete and the building is conditioned for the installation of the interior finishes and for permanent conditioning of the building.
1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

J. Temporary Partitions: As required, provide floor-to-ceiling dustproof partitions to limit dust and dirt migration from other areas and as required for code compliance.
1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side
   a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48-inches between doors. Maintain water-dampened foot mats in vestibule.
2. Insulate partitions to provide noise protection to occupied areas.
3. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
4. Protect air-handling equipment.
5. Weather strip at all openings.
6. Provide walk-off mats at each entrance until Substantial Completion.

K. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Prohibit smoking in construction areas, only allowed in designated areas, refer to Division 01 Section "Summary" for compliance with LEED requirements (if applicable).
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review with the local fire department and establish procedures to be followed, instruct personnel and post warnings and prevention/protection information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard, replace, or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure, but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
   a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
   b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
   c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.6 OPERATION, TERMINATION, AND REMOVAL

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

B. Maintenance: Maintain the temporary facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis as required to achieve appropriate results and to avoid the possibility of damage.

C. Termination and Removal: Remove each temporary facility when the use of the facility has ended. If necessary, complete or restore permanent construction that has been delayed due to the interference of the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
1. Materials and temporary facilities are property of Contractor. The Architect reserves right to take possession of the Architect’s and Project’s identification signs.
2. At Substantial Completion, clean and restore the site and permanent facilities used during construction duration. Comply with final cleaning requirements specified in Division 01 Sections "Closeout Procedures" and “Field Engineering.”

END OF SECTION

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SECTION 01 5819

ARCHITECT'S IDENTIFICATION SIGN

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **Section Includes:** Architect's Identification Sign.

B. Related Sections:

1. Section 01500 - Temporary Facilities and Controls: Project identification and temporary signs.

PART 2 - PRODUCTS

2.1 SIGN MATERIALS

A. **Graphic Design, Content, Colors, Lettering Style:** Architect will furnish Contractor with one (1) vinyl signs. Contractor shall mount back-to-back on plywood backing and structure in detailed in Section 3.

B. **Sign Size:** Nominal 3 feet by 6 feet - 2 inches.

C. **Support Structure, Framing, and Trim:** All pressure treated, sizes as specified on sign detail at end of this Section.

D. **Paint and Primers:** Exterior quality, gloss alkyd enamel, two coats, paints shall be approved by Architect.

1. One coat primer: Exterior Alkyd Wood Primer:
   a. Sherwin Williams; Exterior Oil Wood Primer, A-100.
2. Two topcoats: Exterior Alkyd Enamel (Gloss): (Gloss Level 6).
   a. Sherwin-Williams; Seaguard 1000 Marine Enamel, Industrial & Marine.
   b. Color shall be Sherwin Williams SW 6524 "Commodore" or approved equal.

E. **Concrete:** Concrete for sign post footings shall be minimum 3,000 psi. Comply with ASTM C 94; ACI 301, "Specification for Structural Concrete"; ACI 117, "Specifications for Tolerances for Concrete Construction and Materials"; and CRSI's "Manual of Standard Practice."

F. **Fasteners:** Fasten sign with stainless steel screws and stainless steel cup washers. All other fasteners and accessories shall be hot dip galvanized.

PART 3 - EXECUTION

3.1 INSTALLATION

A. **Install Architect's identification signs** within 30 days after date fixed by Notice to Proceed.

B. Erect Architect's identification signs in locations as directed by Architect.

C. **Installation:** Contractor shall roll out Architect's vinyl sign and mount sign to supports and framing as detailed on the sketch at end of this Section.

D. **Install signs** plumb and level. Anchor securely.

E. **Paint all exposed surfaces of sign,** supports, and framing according to manufacturer's and as specified above.

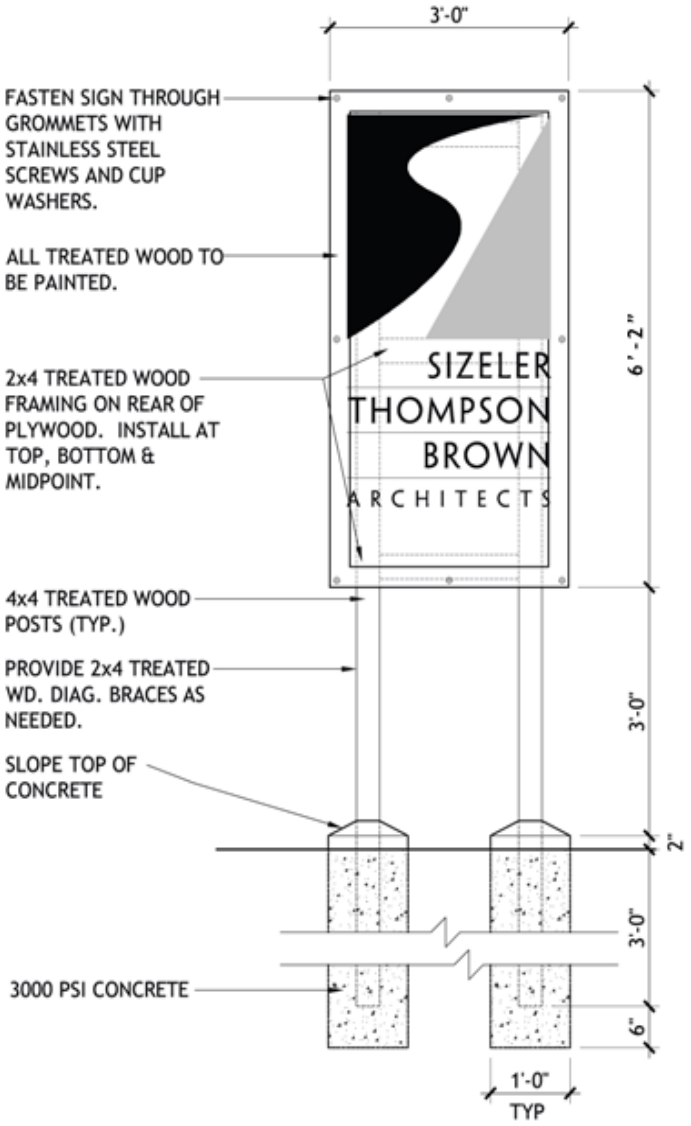
F. Site Signage shall be restricted to the Architect's Identification sign, the Owner's project sign provided by and installed by contractor. Contractor's identification signs or banner (not to exceed 100 Square Feet, total). Identification signs required by code for plumber and electrical (not to exceed 2 feet by 2 feet for each trade). No other signs or banners permitted without written permission of the Architect.

3.2 MAINTENANCE

A. **Maintain signs** and supports and keep clean. Repair damage. Replace deteriorated signs during course of project as directed by Architect.

3.3 REMOVAL

A. **Remove signs,** framing, supports, and foundations at completion of Project and restore the area. Return vinyl sign to Architect.



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SECTION 01 6000

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes:
1. Definitions.
2. Quality assurance: ADA compliance.
3. Product delivery, storage, and handling.
4. Product selection procedures.
5. Hazardous materials.
6. Installation of products.

B. Related Sections include:
1. Section 01 4200 - References: Applicability of industry standards to products specified.
2. Section 01 6300 - Product Substitution Procedures: Requirements for substitution requests made after award of the Contract.

1.3 DEFINITIONS

A. **Definitions:** Terms used in the Drawings and Specifications such as “specialties”, “systems”, “structure”, “finishes”, and “accessories”, which are self-explanatory and have well recognized meanings in the construction industry are not changed by this Section.
1. Products: Items purchased for incorporation in the work, whether produced for the Project or taken from previously produced stock, including “materials”, “equipment”, “systems”, and similar terms.
2. Named Products: Items identified by manufacturer's product name, make or model designation.
3. Materials: Products that are shaped, cut, worked, mixed, finished, fabricated, processed, or assembled to form a part of the work.
4. Equipment: Products with operational parts, whether motorized or manually operated, that usually, but not necessarily, requires service connections such as wiring or piping.

1.4 QUALITY ASSURANCE

A. **Source Limitations:** To the fullest extent possible, provide all products of the same kind from a single source.

B. **Compatibility of Options:** When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with other products.

C. **Labels and Nameplates:** Unless required for evidence of compliance and to display essential operating data, labels and nameplates shall be concealed in the

completed construction.

1. Labels: Where required for observation after installation, locate product labels on an accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain essential operating data such as:
   a. Name of product and manufacturer.
   b. Model and serial number.
   c. Capacity.
   d. Speed.
   e. Ratings.

D. ADA Compliance: Provide products and installation of products to comply with 28 CFR Part 36 “ADA Accessibility Guidelines for Buildings and Facilities”. Notify the Architect of any observed conflicts or omissions between the requirements indicated for this project and the ADA Guidelines.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. General: Deliver, store and handle products in accordance with the manufacturer's recommendations. Prevent damage, deterioration and loss, including theft.

B. Delivery: Schedule delivery to avoid long-term storage at the site and to prevent overcrowding of construction and storage spaces.

1. Deliver products to the site in the manufacturer's original packaging with labels and instructions for handling, storing, unpacking, protecting and installing.

C. Inspection: Inspect products upon delivery to ensure that they comply with requirements and are undamaged and properly protected.

D. Storage: Store products at the site to facilitate inspection and measurement of quantity or counting of units.

1. Store heavy products in a manner that will not endanger the supporting construction.
2. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and (unless otherwise specified or permitted) previously unused.

1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details for complete installation and for the intended purpose.
2. Where available, provide standard product types that have been used successfully in similar situations.
3. As specified in “Section 01 4200 - References”, quantity or quality levels shown and specified represent minimum acceptable levels.

2.2 PRODUCT SELECTION PROCEDURES

A. **Proprietary Specification Requirements:** Where two or more products or manufacturers are named, provide one of the products indicated or an Architect-approved equal by Addendum prior to receipt of Bids in accordance with the Instructions to Bidders. No substitutions will be permitted after award of the Contract except as provided in "Section 01 6300 - Product Substitution Procedures."

1. Quality Standards: Proprietary specifications are used only to denote the quality standard of the products desired, and do not restrict Bidders to the specific brand, make, manufacturer or specification named. Proprietary specifications are used only to set forth and convey to prospective Bidders the general style, type, character and quality of the products desired. Equivalent products will be acceptable, but only with written prior approval as described in the Instructions to Bidders.

B. **Reference Standards Specification Requirements:** Where products are specified in accordance with an established standard. Select any product that meets or exceeds those standards.

C. **Descriptive Specification Requirements:** Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a manufacturer's name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

D. **Performance Specification Requirements:** Where Specifications require compliance with performance requirements, with or without use of a manufacturer's name, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. Appropriate overall performance of a product is implied where the product is specified for a specific application.

E. **Compliance with Standards, Codes and Regulations:** Where the Specifications require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified. Refer to "Section 01 4200 - References" for additional provisions.

F. **Visual Matching:** Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.

G. **Visual Selection:** Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, the Architect will select the color, pattern and texture.

2.3 HAZARDOUS MATERIALS

A. **Hazardous Materials:** No products containing asbestos shall be used in the construction.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. **General:** Anchor each product securely in place, accurately located and aligned with other Work. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

1. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be

performed. Do not proceed until unsatisfactory conditions have been corrected.

2. Visual Effects: Provide uniform joint width in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, which do not conflict with requirements contained in Contract Documents. Obtain Architect's determination in case of apparent conflicts.

C. Preliminary Procedures: Inspect products immediately upon delivery and again prior to installation. Remove damaged and defective items from the Project.

1. Verify measurements and dimensions, before starting each installation.

D. Protection: Install each component during weather conditions and Project status that will ensure against damage and deterioration.

1. Protect products and adjacent construction during and after installation, until acceptance, to prevent damage, soiling and deterioration from subsequent operations, harmful exposure, and incompatible materials.
2. Coordinate the erection of temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for those purposes.

E. Attachment: Where mounting heights are not indicated, install components at standard mounting heights recognized within the industry for the application indicated. Refer uncertain mounting height determinations to the Architect for decision.

1. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for thermal and building movement.

F. Replacement and Repair: Promptly remove damaged, defective and non-conforming products and acceptably replace with new, conforming products.

1. Subject to Architect's approval, damaged and defective products may be repaired to condition equivalent to acceptable new condition. Products that cannot be satisfactorily repaired shall be removed and replaced without additional cost to the Owner.
2. Replacement and repairs shall be made by the party responsible for the original installation.

END OF SECTION

SECTION 01 6116
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for Indoor-Emissions-Restricted products.

B. Requirements for VOC-Content-Restricted products.

C. Requirement for installer certification that they did not use any non-compliant products.

1.2 RELATED REQUIREMENTS

A. Section 01 3300 - Submittal Procedures.

B. Section 01 4000 - Quality Requirements: Procedures for testing and certifications.

C. Section 01 6000 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

D. Section 01 6000 - Product Requirements.

1.3 DEFINITIONS

A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
   1. Interior paints and coatings.
   2. Interior adhesives and sealants, including flooring adhesives.
   3. Flooring.
   4. Composite wood.
   5. Products making up wall and ceiling assemblies.
   6. Thermal and acoustical insulation.

B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
   1. Exterior and interior paints and coatings.
   2. Exterior and interior adhesives and sealants, including flooring adhesives.

C. Interior of Building: Anywhere inside the exterior weather barrier.

D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
   1. Concrete.
   2. Clay brick.
   3. Metals that are plated, anodized, or powder-coated.
   4. Glass.
   5. Ceramics.
   6. Solid wood flooring that is unfinished and untreated.

1.4 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; current edition.

B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2005 (Reapproved 2013).

C. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; California Department of Public Health; v1.1, 2010.

D. CARB (ATCM) - Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products; California Air Resources Board; current edition.

E. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2007.

F. CHPS (HPPD) - High Performance Products Database; Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.

G. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Carpet and Rug Institute; Current Edition.

H. UL (GGG) - GREENGUARD Gold Certified Products; UL Environment; current listings at http://http://productguide.ulenvironment.com/QuickSearch.aspx.

I. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1113; current edition; www.aqmd.gov.

J. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

K. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scscertified.com.

L. UL (GGG) - GREENGUARD Gold Certified Products; UL Environment; current listings at http://http://productguide.ulenvironment.com/QuickSearch.aspx.

1.5 SUBMITTALS

A. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

B. Installer Certifications Regarding Prohibited Content: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.

1.6 QUALITY ASSURANCE

A. Indoor Emissions Standard and Test Method: CAL (CDPH SM), using Standard Private Office exposure scenario and the allowable concentrations specified in the method, and range of total VOC's after 14 days.
   1. Wet-Applied Products: State amount applied in mass per surface area.
   2. Paints and Coatings: Test tinted products, not just tinting bases.
   3. Evidence of Compliance: Acceptable types of evidence are the following;
      a. Current UL (GGG) certification.
      b. Current SCS (CPD) Floorscore certification.
      c. Current SCS (CPD) Indoor Advantage Gold certification.
      d. Current listing in CHPS (HPPD) as a low-emitting product.
      e. Current CRI (GLP) certification.
      f. Test report showing compliance and stating exposure scenario used.
   4. Product data submittal showing VOC content is NOT acceptable evidence.
   5. Manufacturer's certification without test report by independent agency is NOT acceptable evidence.

B. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.
      b. Published product data showing compliance with requirements.
      c. Certification by manufacturer that product complies with requirements.

C. Composite Wood Emissions Standard: CARB (ATCM) for ultra-low emitting formaldehyde (ULEF) resins.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current SCS "No Added Formaldehyde (NAF)" certification; www.scscertified.com.
      b. Report of laboratory testing performed in accordance with requirements.
      c. Published product data showing compliance with requirements.
      d. Certification by manufacturer that product complies with requirements.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.1 MATERIALS

A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.

B. Indoor-Emissions-Restricted Products: Comply with Indoor Emissions Standard and Test Method, except for:
   1. Composite Wood, Wood Fiber, and Wood Chip Products: Comply with Composite Wood Emissions Standard or contain no added formaldehyde resins.
   2. Inherently Non-Emitting Materials.

C. VOC-Content-Restricted Products: VOC content not greater than required by the following:
   1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
   2. Joint Sealants: SCAQMD 1168 Rule.
   3. Paints and Coatings: Each color; most stringent of the following:
      a. 40 CFR 59, Subpart D.
      b. SCAQMD 1113 Rule.
      c. CARB (SCM).

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

SECTION 01 6300

PRODUCT SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **Section Includes:** Administrative and procedural requirements for handling product substitutions during bidding and after award of the Contract.

B. Related Sections:
1. Section 01 3300 - Submittal Procedures: Requirements for submitting Submittal Schedule.
2. Section 01 6000 - Product Requirements: Requirements for product selection procedures.
3. Section 01 6310 - Substitution Request Form: Form to be used by Bidder/Contractor for submission of product substitutions before and after award of the Contract.

1.3 LIMITATIONS ON SUBSTITUTION

A. **Substitutions:** Product substitutions will NOT be considered during bidding or after award of the Contract unless the "Substitution Request Form" is used (included in this Project Manual as "Section 01 6310").
1. Substitutions will be acceptable only if the proposed substitute meets all specified requirements, including the manufacturer's specifications for the originally specified product, which were current on the date of the Contract Documents.
2. Proposed substitutions must be approved by both the Architect and the Owner.
3. Requests for substitutions may be considered or rejected at the discretion of the Owner or the Architect.
4. By requesting a substitution, the Contractor warrants the following to the Owner and Architect:
   a. The proposed substitute is equal or superior in all respects, including warranties and guarantees, to the specified product or method.
   b. No additional costs to the Owner or change in time will be involved unless stated in the request.
   c. Necessary coordination with other work will be provided by the Contractor.

B. **Exceptions:** The following are not considered substitutions and are not subject to requirements specified in this section for substitutions:
1. Revisions to Contract Documents requested by the Owner or Architect.
2. Specified options on products and construction methods included in Contract Documents.

1.4 SUBMITTALS

A. Substitution Request Submittal: Requests for substitution will be considered only after compliance with the following:

1. Submit 3 copies of each substitution request form (form shall be completed and signed).
2. Identify the product, or the fabrication or installation method to be replaced, with references to Specification Section and Drawing numbers. Provide complete documentation for the proposed substitution including the following information, as appropriate:
   a. Product Data, including manufacturer's printed recommendations for fabrication and installation.
   b. Samples, where applicable or requested.
   c. Comparison of the proposed substitution with significant qualities of the product originally specified. Significant qualities may include size, weight, durability, performance and visual effect.
   d. Changes or modifications to other parts of the Work necessary to accommodate the proposed substitution.
   e. Effect on the Contractor's Construction Schedule and Contract Time.
   f. Cost information in accordance with procedures for Change Order proposals, if change in the Contract Sum is involved.

1.5 SUBSTITUTIONS REQUESTED DURING BIDDING

A. No substitution will be considered prior to receipt of bids unless written request for approval has been received by the Architect at least **7 WORKING DAYS** prior to the date for receipt of Bids. Such requests shall be submitted on the proper “Substitution Request Form” at the end of this Section and described in as much detail as is reasonable for review of request. 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.

1. The request will be automatically rejected unless the following conditions are met:
   a. The request is submitted on the required “Substitution Request Form” included in these Specifications.
   b. Extensive revisions to Contract Documents are not required.
   c. Proposed changes are in keeping with the general intent of Contract Documents.
   d. The request is timely, *fully* documented, and properly submitted.

B. If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum, as defined in the Instructions to Bidders. Bidders shall not rely upon approvals made in any other manner.

1.6 SUBSTITUTIONS REQUESTED AFTER CONTRACT AWARD

A. Conditions: The Architect's and Owner's evaluation of substitution requests made after Contract is awarded may include the following considerations:

1. The request is directly related to an “or equal” clause or similar language in the Contract Documents.
2. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation, or other considerations of merit, offsetting additional responsibilities to the Owner, which may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate contractors, increased operating and maintenance costs, or similar considerations.

3. The specified product or method of construction cannot be provided within the Contract Time. The request may not be considered if delay from use of the specified product or method results from failure to pursue the Work promptly or coordinate activities properly.
4. The specified product or method of construction is not approved by a governing authority.
5. The specified product or method of construction is not compatible with other materials.
6. The specified product or method of construction cannot be coordinated with other materials.
7. The specified product or method of construction cannot provide a warranty required by the Contract Documents.

1.7 RESPONSE

A. Architect's Action: Within two weeks of receipt of the request for substitution, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on a proposed substitution is not made within the allotted time, use the product or method specified. Acceptance during Construction Phase will be by Change Order if change in Contract Time or Contract Sum is involved. The request will be rejected unless the following conditions are met:
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.

1.8 SUBMITTALS REQUIRED BY THE CONTRACT DOCUMENTS

A. Non-Complying Submittals: Requests for substitution must be in accordance with Paragraph 1.3 of this Section. The routine submittal of Shop Drawings, Product Data and Samples that represent construction not complying with the Contract Documents does not constitute a request for substitution.

B. Required Submittals: Submittals specified in this Section do not take the place of submittals required in the specification Section under which the substitution is proposed, unless exemption from further submittals is stated in the approval.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

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DOCUMENT 01 6310

SUBSTITUTION REQUEST FORM

To: Sizeler Thompson Brown Architects
Regional Design Studio
300 Lafayette Street, Suite 200
New Orleans, LA 70130

Project: River Ridge Public Library
STBA #21188.00

From: _____ **Date:** _____

Specified Item: _____ _____ _____ _____
(Section Number) *(Page Number)* *(Paragraph)* *(Description)*

_____

We believe that the following product is equal or superior to the specified product in appearance, durability, performance, and in every other respect, and we hereby submit it for your consideration as a substitute for the specified item for the above-mentioned project:

A. Proposed Substitution: _____

_____

_____

_____

B. Reason for Substitution: _____

_____

_____

_____

_____

C. COSTS (*Construction Phase Only* - Provide complete breakdown of costs including the cost amount to be DEDUCTED from the Contract Sum if the proposal substitution is accepted. Include documentation for both materials and labor): _____

_____

_____

_____

D. SCHEDULE (*Construction Phase Only* - Describe substitution's affect on construction schedule):

_____

_____

_____

_____

_____

E. **Supporting Data:**

1. Product Data: Attach complete technical data, including laboratory tests, if applicable.
2. Installation: Include complete information on changes to Drawings and/or Specifications describing the steps that the proposed substitution will require for its proper installation.
3. Samples: Submit with request all necessary samples and substantiating data clearly marked to prove equal quality and performance to that which is specified.

F. **List** ways in which the proposed substitution affects dimensions shown on Drawings: ___

_____

_____

_____

G. **List** effects of proposed substitution on other trades: _____

_____

_____

_____

H. **List** ways in which proposed substitution would be affected by applicable code requirements and agency approval: _____

_____

I. **List** differences between proposed substitution and specified item: _____

_____

_____

_____

J. **Manufacturer's warranties** of the proposed and specified items are: Same __ Different__

Explain: _____

_____

_____

_____

K. **List** information on availability of maintenance service and source of replacement materials: _____

_____

_____

_____

_____

L. Certification of, and Assumption of Liability for, Equivalent Performance:
The undersigned states that the function, appearance and quality of the proposed substitution is equivalent or superior to the specified item and **is in full compliance with the Contract Documents and applicable regulatory requirements. NOTARIZATION IS REQUIRED FOR SUPPLIER DURING BIDDING PHASE. NOTARIZATION IS REQUIRED FOR BOTH SUPPLIER AND CONTRACTOR DURING CONSTRUCTION PHASE**. **FAILURE TO PROVIDE SIGNED AND NOTARIZED SUBSTITUTION REQUEST WILL RESULT IN AUTOMATIC REJECTION OF PROPOSED SUBSTITUTION**

_____ _____
Supplier *Signature*

_____ _____
Telephone *Date*

Signature must be by person authorized to legally bind his/her firm to the above terms. Failure to provide legally binding signature will result in rejection.

NOTARY: _____

_____ _____
General Contractor *Signature*

_____ _____
Telephone *Date*

NOTARY: _____

A/E's REVIEW AND ACTION (to be filled-in by Architect/Engineer)

- ❑ **Substitution Proposal Rejected because Not Complete**
- ❑ **Substitution Accepted** **By:** _____
- ❑ **Substitution Accepted as Noted** **Date:** _____
- ❑ **Substitution Rejected** **Remarks:** _____
- ❑ **Substitution Rejected Because Request Received Too Late**

END OF DOCUMENT

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SECTION 01 7123

FIELD ENGINEERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
1. Construction layout.
2. Field engineering and surveying.
3. Final As-Built Surveying.
4. General installation of products.
5. Progress cleaning.
6. Starting and adjusting.
7. Protection of installed construction.
8. Correction of the Work.

B. See Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 SUBMITTALS

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

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

C. Certified Surveys: Submit two copies signed by land surveyor.

D. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

E. Final Surveyed As-Built: Submit 7 hard copies and 1 digital copy as required to receive substantial completion.

1.4 QUALITY ASSURANCE

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

costs indicated in the Contract Documents that require a surveyor are the responsibility of the Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

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

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by

field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

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

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information (RFI) to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents, Division 01 "Request for Information". Refer to Division 01 "Project Management and Coordination".

3.3 CONSTRUCTION LAYOUT

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

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

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

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

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

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

3.4 FIELD ENGINEERING

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

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

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

D. Final Property Survey: Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey. Indicate dimensions, locations, angles and elevation of construction and site work.
1. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of 8 feet (2.4m) in spaces without a suspended ceiling, unless indicated otherwise.

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

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

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

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

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

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

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

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

3.6 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

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

C. Maintain all public roadways, sidewalks, driveways, etc. in a clean condition during the construction project. All mud, waste material, debris, etc. deposited on said areas by the Contractor shall be removed daily, before the end of work or more frequently, as necessary to maintain a clean condition.

D. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

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

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

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

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

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

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

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

3.7 STARTING AND ADJUSTING

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

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation. Adjust Entrances to ensure water and weatherproof integrity of the building and to eliminate any leaking.

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

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 "Quality Requirements."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

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

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

3.9 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 "Cutting and Patching."

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

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

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

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

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

END OF SECTION

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SECTION 01 7329

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes: Requirements for cutting and patching necessary to:
1. Make connecting portions of Work fit properly;
2. Prepare in-place construction to receive new Work;
3. Restore damaged and defective in-place construction.

B. Related Sections:
1. Division 01 Section "Construction Progress Documentation": Contractor's Construction Schedule.
2. Division 02 Section "Demolition": Demolition of selected portions of the existing buildings for alterations.

C. Related Requirements: Specific requirements and limitations applicable to cutting and patching various kinds of Work are included in the respective technical Sections.

1.3 ARCHITECT'S APPROVAL

A. Architect's Approval: Architect's approval is required prior to cutting and patching which (1) affects structural elements, (2) arises due to previously unknown conditions, and (3) affects visual effect and performance qualities of the completed construction.

1.4 SUBMITTALS

A. Cutting and Patching Proposal: Where approval for cutting and patching is required, request and obtain written approval before proceeding. Describe conditions making cutting and patching necessary and outline intended procedures.
1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building’s appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems

that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will e disrupted.

6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

B. Compliance: 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 Work, which is not in compliance with Contract requirements.

1.5 QUALITY ASSURANCE

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

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

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

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

1.6 COORDINATION

A. Coordinate all cutting and patching within the existing building and/or immediately adjacent to occupied areas of the existing building with the Owner.

B. Schedule this work with the Owner in advance to avoid disruption of occupancy.

1. Provide dust control temporary barriers and noise control as required by Owner or other Sections of the Work.

1.7 WARRANTY

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Match adjacent components. If identical materials are not available, use materials that match to the fullest extent possible and whose installed performance will equal or exceed that of original materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Design and provide temporary support of work to be cut and adjacent components to remain.

B. Protection: Protect in-place construction during cutting and patching to prevent damage from operations or from weather exposure. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Coordination: Avoid interference with adjoining areas and interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to **[minimize][prevent]** interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Perform cutting and patching at the earliest feasible time and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Inspection: Before cutting, examine condition of adjacent surfaces and the work area. Take corrective action before proceeding if necessary to safely perform the work and prevent damage or dislocation of construction to remain.

C. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly

to size required and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete

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

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

E. Fire Resistive Construction: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements of local building code, to resist passage of smoke and other gases, and to maintain original fire-resistance rating of construction penetrated.

F. Cleaning: Clean areas and spaces where cutting and patching are performed or used as access. Clean piping, conduit and similar features before they are enclosed or concealed.

END OF SECTION

SECTION 01 7700

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **Section Includes:** Administrative and procedural requirements for contract closeout, including, but not limited to, the following:
1. Inspection and acceptance procedures.
2. Project record document submittal.
3. Operating and maintenance manual submittal.
4. Closeout procedures.
5. Final cleaning.

B. Related Sections:
1. Document 00 7200 - General Conditions.
2. Section 01 4200 - Reference Standards and Definitions: Applicability of industry standards.
3. Section 01 3300 - Submittal Procedures: Procedures for submitting copies of Shop Drawings and Product Data for project record documents.
4. Section 01 7780 - Closeout Submittals: Submittal of warranties and bonds.
5. Divisions 02 through 48: Completion requirements for specific construction activities.

C. **The Requirements of this Section** amplify and do not modify provisions of the General and Supplementary Conditions.

1.3 SUBSTANTIAL COMPLETION

A. **Preliminary Procedures:** Before requesting inspection for certification of Substantial Completion, complete the following. **List exceptions in the request.**
1. 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 written notice that the work or designated portion thereof is substantially complete and a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.
2. Advise Architect that project is ready for inspection by the State Fire Marshal's office.
3. Advise Owner of pending insurance change over requirements.
4. Submit signed roofing guarantees and other specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
5. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
6. Submit record documents and other final record information as applicable and required for the project.

7. Deliver tools, spare parts, extra stock and similar items.
8. Make final change over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change over in security provisions.
9. Perform complete start-up testing and balancing of systems and submit reports to the Architect. Instruct the Owner's personnel in proper operation and maintenance procedures.
10. Discontinue and remove construction mock-ups and similar elements.
11. Remove temporary facilities, construction equipment, and temporary services. Restore disturbed items to original condition, or better.
12. Complete final clean up requirements. Touch-up and otherwise repair and restore marred exposed finishes.
13. Submit final meter readings for utilities and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.
14. If a Storm Water Pollution Prevention Plan was required, submit a copy of the Completion Report form filled out in its entirety.

B. **Inspection Procedures:** On receipt of a request for inspection, Architect will either proceed with inspection or advise the Contractor of unfilled requirements. Architect will prepare the Recommendation of Acceptance, or advise Contractor of construction that must be completed or corrected before the Recommendation will be issued.

1. Architect will perform inspection when assured that the Work has been substantially completed.
2. Results of the completed inspection will form the basis of requirements of final acceptance.

1.4 PUNCH LIST

A. When Project nears completion, prepare a list of items to be completed or corrected. This list shall be submitted to the Architect for his review, verification and amendment. Incorporate all uncorrected items included on observation reports made by Architect's representative. Submit certificates of inspection from all responsible Regulatory Agencies concurrently with punch list.

B. Punch list items shall be completed prior to release of Special Retainage as indicated in the project requirements. Intermediate request for payment for satisfactorily completed punch list items shall be in accordance with the project requirements.

1.5 FINAL ACCEPTANCE

A. **Preliminary Procedures:** Before requesting final inspection for certification of final acceptance and final payment, complete the following.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final changes to the Contract Sum.
3. Submit properly executed Lien and Privilege Certificate not less than 45 days from Substantial Completion date.
4. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
5. Submit consent of surety to final payment on AIA Form G707.
6. Submit a final liquidated damages settlement statement, if applicable.

7. Submit evidence that taxes, fees and similar obligations have been paid.
8. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Re-inspection Procedure: The Architect will reinspect the Work upon receipt of notice that the Work, including items from earlier inspections, has been completed.

1. Upon completion of reinspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled, but are required for final acceptance.

C. Additional Requirements: Refer to General Conditions.

1.6 RECORD DOCUMENTS

A. Project Set: The Contractor **shall maintain one set of record documents.** Do not use record documents for construction purposes; protect from deterioration and loss; provide access to record documents for the Architect's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most suitable for showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red colored erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
3. Note related Change Order numbers where applicable.
4. Provide a schematic roof plan on which is shown and identified each item of roof-top equipment which requires periodic inspection and/or maintenance, such as exhaust fans, intake/exhaust cowls, roof drains, plumbing vent stacks, air conditioning equipment, and operating equipment of any type. Identification of equipment must match identification used in warranty and submittals (ie: RTU-4, EF-4, etc.)
5. Organize record drawing sheets into manageable sets, bind with durable paper cover sheet, and print suitable titles, dates and other identification on the cover of each set. Sheets must be in same order and quantity as the contract documents. All sheets must be included in the set.
6. Submit a reproducible record set of Contract Drawings and an electronic format set of Contract Drawings. The Electronic format must be in PDF format and each file shall be identified the same as the contract documents. (ie: A201, E305, etc.)

C. Record Specifications: 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 written form during construction.

1. Mark these documents to show substantial variations in actual Work performed.
2. Give particular attention to substitutions, selection of options and similar information on elements that cannot be readily identified by direct observation.
3. Note related Record Drawing information and Product Data.
4. Upon completion of the Work, submit record Specifications to the Architect for the Owner’s records.

D. Record Product Data: Maintain one copy of each Product Data submittal,

including items submitted for record purposes. Submit to Architect in the same numbered format and sequence as the contract documents.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted.
2. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations.
3. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation.
4. Note related Change Orders and mark-up of record drawings and Specifications.
5. Upon completion of the Work, submit record Product Data to the Architect for the Owner's records. Record Product data must be provided for all items requiring product data submittals by the specification, even if it was not submitted during the construction phase.

E. Record Samples: Immediately prior to the date or dates of Substantial Completion, the Contractor shall meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes.

1. Deliver selected Samples to the Owner's storage area. Contractor shall dispose of Samples not selected for Owner's records.

F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference.

G. Maintenance Manuals: Unless otherwise specified in the Technical Sections, provide 2 sets of maintenance manuals for the project, incorporating all maintenance, repair and operating procedures specified for the project. Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in heavy-duty 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder.

1. Include the following types of information:
   a. Emergency instructions.
   b. Spare parts list.
   c. Copies of warranties.
   d. Wiring diagrams.
   e. Recommended "turn-around" cycles.
   f. Inspection procedures.
   g. Shop Drawings and Product Data.
   h. Fixture lamping schedule.
   i. Maintenance and repair procedures.
2. Roofing Manuals: The roofing manuals specified in Division 7 shall be provided as one of the required manuals.

H. Submittal: Upon completion of the work, and prior to the awarding of substantial completion. The Contractor transmit all record documents and maintenance manuals to the Architect for the Owner's records. The records must be transferred with an inventory of items provided per each box, roll or container. A master inventory must be provided via electronic format (PDF).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PROJECT CLOSEOUT PROCEDURES – GENERAL SEQUENCE

A. Submit the following initial documentation with a letter indicating that the project is ready for the inspection by the State's Fire Marshal's Office:
1. Life Safety Systems check list for Fire Alarm System.
2. Life Safety System check for Emergency Generator System.
3. Life Safety System for Sprinkler System inspections for underground and or above ground piping systems.
4. Life Safety System check for Fire Dampers. Testing performed by Contractor and witnesses by TAB firm.
5. Life Safety System check for Fire Rated Penetrations and sealing of partitions.
6. Exit lights. Verify proper operation.
7. Door Hardware. Verify proper operation.
8. Testing and Balancing verify installation at various intervals during construction. Submit TAB report prior to acceptance. TAB report must be submitted and approved by Mechanical Engineer before the project is accepted.
9. Submit all inspection reports performed by the Office of the State Fire Marshal during the construction period.
10. Life Safety check for elevators.
11. Inspection by state elevator inspector.

B. After submittal of the initial documentation, the following sequence shall be performed:
1. Architect and Contractor will review documentation submitted and construction status of the project and when determined to be in order and ready for inspection by the Fire Marshal, submit the above listed documentation and Certificate of Completion to the Office of the State Fire Marshal.
2. Fire Marshal Inspection of the project will be scheduled and performed. Fire Marshall will review project and develop and submit Inspection Report.
3. Submit inspection report from states elevator inspector.
4. Contractor shall then submit the Contractor's Punch List to the Architect along with the Fire Marshal Inspection Report and request Substantial Completion.
5. Architect and Engineering Consultant's will perform an inspection to determine Substantial Completion and when determined to be in order and ready for occupancy send Recommendation of Acceptance with Contractor's punch list and Design Team punch list to the owner.
6. A prerequisite to the work being accepted as Substantially Complete is the Owner's receipt of the executed Roofing Contractor's and Roofing Manufacturer's guarantees.
7. TAB report must be submitted by the Contractor and approved by Mechanical Engineer before the project is accepted.
8. Prior to Substantial Completion the Contractor shall transmit project record drawings, specifications, addenda and shop drawings to the Architect.

3.2 CLOSEOUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each Installer of equipment and material that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If

Installers are not experienced in procedures, provide instruction by manufacturer's representatives.

1. Include a detailed review of the following items:
   a. Maintenance manuals and record documents.
   b. Inspection procedures.
   c. Spare parts and materials.
   d. Tools.
   e. Lubricants.
   f. Identification systems.
   g. Control sequences.
   h. Personal and product safety.
   i. Cleaning.
   j. Warranties and bonds.
   k. Maintenance agreements and similar continuing commitments.

B. Demonstration: As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up.
2. Shut-down.
3. Emergency operations.
4. Noise and vibration adjustments.
5. Safety procedures.
6. Economy and efficiency adjustments.
7. Effective energy utilization.

3.3 FINAL CLEANING

A. General: General cleaning during construction is required by the General Conditions and included in “Section 01 7123 – Field Engineering.”

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions and requirements in individual Specifications Sections. Complete the following cleaning operations before requesting inspection for Substantial Completion.

1. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, and other excess and foreign materials from exposed-to-view interior and exterior surfaces, new and existing.
2. Remove labels that are not permanent labels.
3. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace scratched, cracked, chipped and broken glass and other damaged and defective transparent materials.
4. Clean exposed exterior and interior finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
5. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
6. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.
7. Clean and rejuvenate permanent facilities and equipment 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 use.
d. Remove used lubricants and replace with new, manufacturer-recommended lubricants.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not abandon or bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful and dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

E. Owner's Right to Clean Up: If the Contractor fails to perform final cleaning and removal of protection as specified, and fails to promptly and diligently commence and continue specified cleaning and removal after written notice by the Owner or Architect, the Owner may execute such cleaning and removal and deduct by appropriate Change Order the cost of the cleaning and removal from the Contract Amount. This right of the Owner, if exercised, shall be exercised without prejudice to any other remedy the Owner may have under the Contract Documents or law.

F. Materials for Owner's Use: Where extra materials of value remaining after completion of Work have become the Owner's property, and where extra stock of materials are required by the Contract Documents, arrange for disposition of these materials as directed.

G. Architect's Identification Sign: Return Architect's vinyl identification sign to Architect upon removal of sign supporting structure.

3.4 CONTINUING INSPECTIONS

A. General: As required by special guaranteed warranties, agreements to maintain, workmanship bonds, and similar continuing commitments, comply with Owner's request to participate in inspections at the end of each time period of such continuing commitments. General Contractor and all major subcontractors shall participate in a general inspection of the work approximately one year after the date of Substantial Completion and prior to the one year date to determine the general condition of the Work.

END OF SECTION

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SECTION 01 7800

CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes: General administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturers standard warranties on products and special warranties.

B. Related Sections:
1. Division 01 “Submittal Procedures” for procedures for submitting warranties.
2. Division 01 “Closeout Procedures” for procedures for contract closeout.
3. Division 01 "Operation and Maintenance Data" for manuals required at closeout.
4. Division 01 "Demonstration and Training."
5. Divisions 02 through 48 Sections for specific warranty requirements for products and installations specified to be warranted.
6. Certifications and other commitments and agreements for continuing services to Owner that are specified elsewhere in the Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work nor does it relieve suppliers, manufacturers, and subcontractors required to sign special project warranties.

1.3 DEFINITIONS

A. Standard Product Warranties are preprinted written warranties issued by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged or accessed for construction to warranty Work.

B. Reinstatement of Warranty: When work covered by a warranty has failed and been corrected by replacement, reinstate the warranty by written endorsement.

The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing defective Work regardless of whether the Owner has benefitted from use of the Work for a portion of its anticipated useful service life.

D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: Owner reserves the right to reject warranties and to limit selection of products with warranties not to conflict with requirements of the Contract Documents.
2. Owner reserves the right to refuse Work where a special warranty, certification or similar commitment is required, until evidence is presented that entities required to sign such commitments are willing to do so.

1.5 SUBMITTALS

A. General: Submit written warranties to the Architect prior to the date of Substantial Completion. If the Substantial Completion date extends past the anticipated date, all warranties shall be updated with the proper Substantial Completion date and resubmitted to the Architect, prior to the actual Substantial Completion.

1. When a designated portion of the Work is completed and occupied or used by the Owner, submit properly executed warranties to the Architect within 15 days of completion of that designated portion of the Work.

B. Special Warranties: When the Contract Documents require the Contractor, subcontractor, supplier or manufacturer to execute a special warranty, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.

1. Refer to individual Sections of Divisions 2 through 48 for specific content requirements and particular requirements for submittal of special warranties.

C. Form of Submittal: At Substantial Completion, submit 3 copies of each required warranty properly executed by the Contractor, subcontractor, supplier or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy duty, durable 3-ring vinyl covered loose leaf binders, thickness as necessary to accommodate contents, sized to receive 8-1/2- by 11-inch paper.
2. Provide heavy-duty paper dividers with plastic covered tabs for each separate warranty. Mark tabs to identify the product or installation. Provide a typed description of the product or installation, including the product name and manufacturer, and the name, address and telephone number of the installer.

3. Identify each binder on the front and the spine with the typed or printed title "WARRANTIES AND BONDS", the Project name and the name of the General Contractor.

4. When warranted construction requires operation and maintenance manuals, provide additional copies of each required warranty, as necessary, for inclusion in each required manual, as specified in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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SECTION 01 7830

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance data.

B. Related Sections:
1. Division 01 "Closeout Procedures" for closeout requirements.
2. Division 01 "Closeout Submittals" for warranty closeout for each individual section.
3. Division 01 "Demonstration and Training."
4. Division 07 "Modified Bitumen Roofing" for roofing manuals.
5. Division 02 through 48 Sections for specific operation and maintenance manuals.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

C. A/E: Architect / Engineer

1.4 SUBMITTALS

A. Initial Submittal: Submit to the A/E three (3) electronic copies of each manual in final form no later than 60 days prior to commencement of the owner's training. Include a complete operation and maintenance directory.
1. A/E will forward one (1) electronic copy of the manuals received to the Owner for review and comment. The Owner shall receive the final form of the Operation and Maintenance manuals 45 days prior to the commencement of owner training to have adequate time for review and comments.
2. General Contractor will make any corrections required and resubmit all copies until such time the A/E and Owner find them acceptable.

B. Final Submittal: Submit three (3) paper copies of each manual and one (1) electronic copy of each manual in final form evidencing acceptance by the A/E and Owner. The Operation and Maintenance manuals must be delivered to the Owner (end user) a minimum of 7 days prior to the commencement of any Owner's training on all systems or equipment.

1. Submit all copies to the Owner's Authorized Representative with a transmittal indicating compliance with requirements for submittal of Operation and Maintenance Data. Owner's Authorized Representative will be responsible for distribution to the appropriate parties, including the end user.

1.5 COORDINATION

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

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:
1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

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

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

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

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, sub-system, and piece of equipment with the same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 MANUALS, GENERAL

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and sub-system and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: For paper copies of manuals enclose title page in transparent plastic sleeve, electronic copies shall have title page as first page of file for manual. Include the following information:
1. Subject matter included in manual.

2. Name and address of Project.
3. Name and address of the Owner.
4. Date of submittal.
5. Name, address, and telephone number of Contractor.
6. Name and address of A/E.
7. Cross-reference to related systems in other maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include a comprehensive table of contents for all volumes in each binder of the set.

D. Paper Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem and equipment. If possible, assemble instructions for subsystems, equipment and components of one system into a single binder.
1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
   a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
   b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name and subject matter of contents. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch, 20-lb/sq. ft. white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents and drawing locations.

E. Electronic Manual Contents: Organize into sets of manageable size to ensure files for manual are contained within a single compact disc. Arrange contents alphabetically by file name or bookmarking, for organization to coincide with system, subsystem and equipment. Ensure instructions for subsystems, equipment and components of one system into a single compact disc.
1. Compact Discs: All files shall be burned on to compact discs and provided in

plastic cases. Discs shall be clearly labeled with the same information as required for the manual title page. If more than one manual is present on the disc a listing of the manual contained shall be provided on the label.

a. If two or more discs are necessary to accommodate data of a system, organize data in each disc into groupings by subsystem and related components. Cross-reference other discs by bookmarking or annotations in the electronic files contained on the disc, if necessary, to provide essential information for proper operation or maintenance of equipment or system.
b. Discs shall be clearly labeled with the same information as required for the manual title page. If more than one manual is present on the disc, a listing of the manual contained shall be provided on the label.

2. Bookmarking: The O&M manuals shall be fully integrated and navigable. "Fully integrated and navigable", is defined in this context as the ability for users to review and locate information utilizing bookmarks or other file organization methods. Use of folder structures for this purpose will be permitted, provided file nomenclature utilized clearly indicates the type of document the file contains and all information pertinent to a given system, sub-system and/or unit is contained within a single folder.
3. Searching: All files shall be fully searchable using standard text search functions. If scanned copies of documents are provided, these files shall be converted into OCR recognized text format with original image overlay.
4. Acceptable Electronic Formats: Acceptable electronic formats for files provided for manuals shall be as listed below. Contractor shall be responsible to provide free viewers for all formats not listed below for any files provided in their submission.
   a. Word 2002 or newer
   b. Excel 2002 or newer
   c. Adobe Acrobat 8.0 or newer
   d. WAV
   e. WMV
   f. DWF
   g. HTML

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment and component:
1. Fire.
2. Flood.
3. Hurricane.
4. Gas leak.
5. Water leak.
6. Power failure.
7. Water outage.
8. System, sub-system, or equipment failure.
9. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of the Board's operating personnel for notification of Installer, supplier and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:
1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, sub-system, and equipment descriptions.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Flow diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:
1. Product name and model number.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation and diagram controls as installed.

E. Piped/Ducted Systems: Diagram piping as installed and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUAL

A. Content: Organize manual into a separate section for each product, material and finish. Include source information, product information, maintenance procedures, repair materials and sources and warranties and bonds, as described below.

B. Source Information: List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:
1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: For each system, sub-system, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts and warranty and bond information, as described below.

B. Source Information: List each system, sub-system, and piece of equipment included in the manual identified by product name and arranged to match manual's table of contents. For each product, list name, address and telephone number of Installer or supplier and maintenance service agent and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
1. Standard printed maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components. (exploded parts breakdown)
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair and replacement; and reassembly instructions.
5. Aligning, adjusting and checking instructions.
6. Demonstration and training videotape, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by the Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, sub-system and piece of equipment not part of a system.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, sub-system and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by the Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
1. Do not use original Project Record Documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared Record Drawings in Division 01 "Closeouts Procedures."

END OF SECTION

SECTION 01 7900

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for instructing the Owner personnel in the operation and maintenance of systems, sub-systems and equipment.

B. Related Sections:
1. Division 01 “Closeout Procedures" for closeout requirements.
2. Division 01 "Closeout Submittals" for warranty closeout for each individual section.
3. Division 01 "Operation and Maintenance Manuals."
4. Division 02 through 48 Sections for specific demonstration and training requirements of each individual section.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Sub-system: A portion of a system with characteristics similar to a system.

C. A/E: Architect / Engineer

1.4 SUBMITTALS

A. The Contractor shall be responsible to submit a formal training program to be utilized for each respective system under their responsibility 45 days prior to substantial completion to the A/E and Owner. It is the Contractor’s responsibility to work with Owner, A/E and other contractors to develop a cohesive training session schedule that complies with Owner’s personnel availability, scheduling requirements of A/E and other contractor’s sessions, and specifies completion of all training sessions prior to substantial completion. The training program shall include at a minimum the following:
1. Training Outline that summarizes all training sessions and their proposed dates, times, length of instruction, names of instructors, along with a summary learning objective for each training module.
2. Detailed Agenda for each training module that includes the following:
   a. Session title.

b. Proposed date of the session.
c. Intended audience.
d. List of systems and equipment to be reviewed.
e. Training objectives and topics by system and equipment.
f. Listed durations for each objective and topic.
g. Instructor, including name and affiliation, for each objective and topic.
h. Instructor qualifications for each instructor listed. The Contractor is responsible to ensure each instructor has an intimate knowledge of the system or equipment and the installation for this project. The Owner shall have the right of refusal to reject any proposed instructor that is not deemed qualified for provision of training.

3. Contractor contact sheet, including address, phone number, fax number and e-mail.
4. O&M data applicable to session.
5. Copy of As-Builts.
6. Additional materials to be utilized including copies of any materials and/or video to be utilized during the session.
7. An example of a Sample Training Session Agenda recommended is shown in Annex A at the end of this section.

B. Sign-off sheets: Submit copies of proposed sign-off sheets for each training session a minimum of 14 days prior to the scheduled training. Sign-off sheets are to include the following information:

1. Name of training session
2. Date of training
3. Beginning/Ending time
4. Detailed, itemized summary listing all areas of training for that session.
5. Listing of hand-out materials distributed at the session.
6. Signature lines for Trainer, Contractor, and Owner personnel being trained.
   a. Signature by Owner personnel evidences training received only to the extent listed on the sign-off sheet summary.

C. Demonstration and Training DVD: Contractor to provide recordings of each demonstration and training session module for future use by the Owner. Submit three (3) copies within seven days of end of each training module. Copies shall be of professional audio and video quality, including provision of CD/DVD menu structure and labeling.

1.5 QUALITY ASSURANCE

A. Instructor Qualifications: A factory-authorized service representative, experienced in operation and maintenance procedures for the equipment being demonstrated and the training of personnel tasked with using and maintaining the equipment.

1.6 COORDINATION

A. Coordinate instruction schedule with the Owner’s operations and schedule through the Owner’s Authorized Representative. Adjust schedule as required to minimize disrupting the Owner’s operations and to ensure attendance by designated Owner representatives.

B. Coordinate content of training modules with content of emergency, operation, and maintenance manuals. Provide copies of this coordinated material at each training session. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

C. Completion of all training sessions must occur prior to substantial completion.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, or as outlined under the Training Program Matrix contained under Annex B, whichever is more stringent.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction and material for the system, equipment, or component as following:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
   a. System, sub-system, and equipment descriptions.
   b. Performance and design criteria if Contractor is delegated design responsibility.
   c. Operating standards.
   d. Regulatory requirements.
   e. Equipment function.
   f. Operating characteristics.
   g. Limiting conditions.
   h. Performance curves.
   i. Review of typical sensor and energy trending reports
2. Documentation: Review the following items in detail:
   a. Emergency manuals.
   b. Manufacturer’s operation manuals.
   c. Manufacturer’s maintenance and troubleshooting manuals.
   d. Project record documents.
   e. Identification systems (valve charts, etc)
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Demonstration of alarms
   c. Instructions on stopping.
   d. Shutdown instructions for each type of emergency.
   e. Operating instructions for conditions outside of normal operating limits.
   f. Sequences for electric or electronic systems.
   g. Special operating instructions and procedures.
4. Operations: Include the following, as applicable:
   a. Start-up procedures.
   b. Equipment or system break-in procedures.

c. Routine and normal operating instructions.
d. Regulation and control procedures.
e. Control sequences.
f. Safety procedures.
g. Instructions on stopping.
h. Normal shutdown instructions.
i. Operating procedures for emergencies.
j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.
7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.
   h. Demonstration of equipment or system coordination and control using the BMS.
8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 GENERAL

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.

B. Engage qualified instructors to instruct the Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
1. The Owner's Authorized Representative will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times as approved in the training schedule matrix. For equipment that requires seasonal operation, provide similar instruction at start of each season.
1. The training schedule will be coordinated through the Owner's Authorized Representative.

D. Two (2) days prior to the scheduled training session, Contractor shall notify Architect and Owner and participants of confirmation for training session.

E. All training sessions shall follow the approved agenda and shall be provided in the following format:
1. Classroom session.
2. Site walk-through. Facility walkthrough shall identify location of all cleanouts, valves, test ports, access dampers, devices, equipment, panels, etc.
3. Field demonstration of operation.
4. Contractor directed and reviewed annual maintenance of equipment or system, as provided by Owner personnel.

F. Sign-off Sheets: At the conclusion of each training module, obtain sign-offs using the approved sign-off sheets. Executed sign-off sheets are to be submitted as part of the closeout documentation evidencing compliance with training requirements.

G. Demonstration and Training Videotape: Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids.
1. At beginning of each training module, record each chart containing learning objective and lesson outline.

H. Cleanup: Collect used and leftover educational materials and give to the Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

I. Re-training: The contractor is responsible for all expenses and time for all participants and consultants (A/E, etc.) in attendance if one of the following occurs:
1. If confirmation is received as required in 3.1-D (2-days before training session) and the training session is subsequently cancelled or the specified instructor does not show up.
2. If the Owner does not sign-off that the training meets the requirements previously submitted in the training outline and agenda.

ANNEX A – SAMPLE TRAINING SESSION AGENDA

Training Agenda – [insert system name]

Project #: _____

Project Title: _____

Applicable Spec Sections: _____

Training Materials to be Provided:

SECTION 1: AUDIENCE AND GENERAL SCOPE

Intended Audience Type (check all that apply):	❑ Facilities Management Personnel ❑ Engineering and Operations Personnel ❑ A/E ❑ Users/Occupants

General Scope of Training (check all that apply):	❑ System & Operations Overview ❑ Basic Operations & Maintenance ❑ Detail Theory, Operations and Maintenance ❑ User Orientation

SECTION 2: INSTRUCTORS

ID	Instructor Name	Company
1.		
2.		
3.		
4.		
5.		

SECTION 3: OBJECTIVES

SECTION 4: AGENDA

Part A – [insert title of part for session]

Topic/Demonstrations	Dates	Instructor ID	Duration (hr x freq)
1.			x
2.			x
3.			x
4.			x

Total Duration of Session Part (hrs):

ANNEX B – TRAINING PROGRAM MATRIX

The training program matrix defined below describes additional objectives/topics to be covered for training and demonstration. These objectives are in addition to those training requirements in this specification and stated in other specifications.

Specification Section	Section Title	Training Requirement(s)	Responsible Party	Minimum Duration (hrs)	Special Requirements

END OF SECTION

DIVISION 2

EXISTING CONDITIONS

Sizeler Thompson Brown Architects
300 Lafayette Street, Suite 200
New Orleans, LA 70130
Phone: 504-523-6472
Fax: 504-529-1181

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SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.
   1. Selective removal and disposal of existing construction as indicated on Drawings and as required to accommodate new construction. Demolition work includes, but is not limited to, the following:
      a. Selective demolition and removal of portions of existing building.
      b. Protection of existing structure affected by demolition operations.
      c. Protection of existing utilities to remain.
      d. Temporary protection for the public from demolition operations.
      e. Pollution control during demolition operations.
      f. Notification to Owner of schedule of shut-off of utilities which serve occupied spaces of adjacent buildings.
      g. Removal and legal disposal of materials.

1.3 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 1000 - Summary: Sequencing and staging requirements.

C. Section 01 1000 - Summary: Description of items to be removed by Owner.

D. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

E. Section 01 7123 - Field Engineering.

F. Section 01 7329 - Cutting and Patching.

G. Division 21 - Fire Suppression: Removal and relocation of pipes and fixtures.

H. Division 22 - Plumbing: Removal and relocation of pipes and fixtures.

I. Division 23 - Heating, Ventilation, Air Conditioning (HVAC): Removal and relocation of conduits, ducts and other mechanical equipment or work.

J. Division 26 - Electrical: Removal and relocation of conduits, fixtures and other electrical equipment of work.

K. Work Not Included: Any hazardous materials abatement will be performed by a separate contractor prior to start of Contract work under each construction stage.

1.4 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.5 DEFINITIONS

A. **Remove**: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged.

B. **Remove and Salvage**: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner. Include fasteners or brackets needed for reattachment elsewhere.

1.6 MATERIALS OWNERSHIP

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

1.7 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. **Proposed Protection Measures**: Submit informational report, including Drawings, that indicates the measures proposed for protecting individuals and property for dust control and for noise control. Indicate proposed locations and construction of barriers.

C. **Schedule of Building Demolition Activities**: Submit two (2) copies of demolition work schedule for review by Architect prior to commencement of work. Indicate the following:
   1. Proposed methods for demolition.
   2. Detailed sequence of demolition work, with starting and ending dates for each activity.
   3. Temporary interruption of utility services.
   4. Shutoff and capping or re-routing of utility services.
   5. Coordinate shut-off, capping, and continuation of utility services.
   6. Relate requirements to phased construction activities, together with details for dust and noise control protection.

D. Predemolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Division 01 Section "Photographic Documentation." Submit documentation to Architect before the Work begins.

E. Site Plan: Showing:

1. Vegetation to be protected.
2. Areas for temporary construction and field offices.
3. Areas for temporary and permanent placement of removed materials.

F. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.8 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of 5 years of experience.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

1.9 PROJECT CONDITIONS

A. Area immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied building will not be disrupted.
   1. Provide not less than 72 hours' notice of demolition activities that will affect Owner's normal operations of adjacent occupied building.
   2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
      a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.

B. **Hazardous Materials**: It is not expected that hazardous materials will be encountered in the Work.
   1. Hazardous materials will be removed by Owner before start of the Work.
   2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

C. **Contractor-Salvaged Items**: Items indicated to be removed but of salvageable value to Contractor may be removed from site as work progresses. Transport salvaged items from site as they are removed.
   1. On-site storage or sale of removed items or materials is not permitted.

D. **Building Services**: Maintain existing mechanical and electrical services indicated to remain, keep in service, and protect against damage during demolition operations. Do not interrupt existing services serving occupied or used facilities, except when authorized in writing by Owner. Provide temporary services during interruptions as acceptable to Owner.

1.10 COORDINATION

A. Arrange demolition schedule so as not to interfere with Owner's on-site operations.

1.11 WARRANTY

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

PART 2 PRODUCTS

2.1 MATERIALS

A. Fill Material: As indicated on structural drawings.

B. Exterior Wall Demolition Partition: As indicated on drawings.
   1. Materials:
      a. Metal Studs: As specified in Section 05 4000 - Cold-Formed Metal Framing.
      b. Plywood Sheathing: As specified in Section 06 1000 - Rough Carpentry.
      c. Water-Resistive Barrier: As Specified in Section 07 2500 - Weather Barriers.
      d. Batt Insulation: As specified in Section 07 2100 - Thermal Insulation.
      e. Drip Plate Flashing: As specified in Section 04 2000 - Unit Masonry.
      f. Sealants: As required, as specified in Section 07 9005 - Joint Sealer, and as recommended by water-resistive barrier manufacturer for conditions encountered.
      g. Interior Veneer: Provide 10-mil, minimum thickness, visqueen sheet, continuous on interior side of partition. Lap joints 4 inch (102 mm), minimum. Attach to studs with self-tapping screws with neoprene washers. Tape over attachment locations and apply continuously over joints with heavy duty, high performance masking tape. Locate as indicated on drawings.
         1) 3M; Performance Yellow Masking Tape 301+ or equal.
         2) Width: 3 inch (76 mm), nominal, minimum.
   2. Install, anchor and support system as required to existing structure and slab to meet design loads indicated on structural drawings. System is to remain air-tight and water-tight for full duration of installation. Patch and repair as required.

PART 3 EXECUTION

3.1 PREPARATION- GENERAL

A. **Inspections**: Prior to commencement of demolition work, inspect adjacent occupied areas and areas in which work will be performed. Provide documentation specified under “SUBMITTALS” of this Section.

B. **Protection**: Provide protections as specified in PART 1 of this Section. Cover and protect duct openings, equipment and fixtures to remain from soiling and damage

when demolition work is performed in rooms or areas from which such items have not been removed.

C. **Building Services**: Locate, identify, stub-off and disconnect building services that are not indicated to remain. Notify Architect in advance of interruptions. Arrange for temporary relocations and service by-pass as required.

3.2 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

B. Review Project Record Documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

3.3 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. **General**: Perform selective demolition in a systematic manner. Use methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.
   1. Provide effective air and water pollution controls as required by governing authorities.
   2. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.
   3. Cut floor slabs using removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw and core drill where possible.
   4. Promptly remove demolition dust and debris from adjacent remaining and in-use facilities.
   5. Procedures that generate excessive noise are subject to Owner approval prior to work due to occupancy. Indicate such work on Schedule of Demolition.

B. Comply with other requirements specified in Section 01 7700.

C. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Provide, erect, and maintain temporary barriers and security devices.
   5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   7. Do not close or obstruct roadways or sidewalks without permit.

8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

D. Do not begin removal until receipt of notification to proceed from Owner.

E. Do not begin removal until built elements to be salvaged or relocated have been removed.

F. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
      a. Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
         1) Strengthen or add new supports when required during progress of demolition.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

G. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

H. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
   1. Notify Architect promptly and proceed in accordance with requirements under "Concealed Conditions".

I. **Concealed Conditions**: If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to the Architect in written, accurate detail. Pending receipt of directive, rearrange selective demolition schedule as necessary to continue overall job progress without delay.

3.4 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.
   1. Arrange to shut off indicated utilities with utility companies.
   2. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
   3. Cut off pipe or conduit a minimum of 24 inches (610 mm) below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.

B. See Divisions 22 and 26 Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

C. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

D. Protect existing utilities to remain from damage.

E. Do not disrupt public utilities without permit from authority having jurisdiction.

F. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

G. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

H. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

I. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

J. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.5 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.
   2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work, at no additional cost to the Owner.
   4. Patch as specified for patching new work.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. **Masonry**: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts. Remove brick in “saw-tooth” where new brick is to be installed and to provide finished brick openings.

B. **Concrete Slabs-on-Grade**: Saw-cut perimeter of area to be demolished, then break up and remove. Cut floor slabs using removal methods that will not crack or structurally disturb adjacent slabs or partitions.

C. **Floor Coverings**: Remove floor coverings and adhesive according to recommendations from new floor covering manufacturer. Remove residual adhesive and prepare substrate for new floor coverings by the methods recommended by new flooring manufacturer.

D. **Air Conditioning Equipment**: Remove equipment without releasing refrigerants.

3.7 PROTECTION

A. **Protections**: Provide temporary barricades and other forms of protection as required to protect Owner's property, personnel and the general public from damage and injury due to selective demolition work.
   1. Provide protective measures as necessary for free and safe passage of occupants to and from occupied and in-use portions of existing science building.
   2. Protect from damage existing work that is to remain in place.
   3. Remove protections at completion of work.

B. **Existing Facilities**: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

C. **Existing Utilities**: Maintain utility services to remain and protect from damage during demolition operations.
   1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
   2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
      a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

D. **Temporary Protection**: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Division 01 Section "Temporary Facilities And Controls."
   1. Protect adjacent buildings and facilities from damage due to demolition activities.
   2. Protect existing site improvements, appurtenances, and landscaping to remain.
   3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
   4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
   6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
   7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.

E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.8 DEMOLITION, GENERAL

A. **General**: Demolish indicated portions of buildings and site improvements, indicated on drawings, completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
   2. Maintain fire watch during and for at least 4 hours or as required by authority having jurisdiction after flame cutting operations.
   3. Maintain adequate ventilation when using cutting torches.
   4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. **Engineering Surveys**: During demolition, perform surveys to detect hazards that may result from building demolition activities.

C. **Site Access and Temporary Controls**: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
   1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
   2. Use water mist and other suitable methods to limit spread of dust and dirt to lowest practical level. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

D. **Explosives**: Use of explosives is not permitted.

3.9 WORK IN AND BELOW FLOORS AND ROOFS

A. **Coordination**: Where execution of the work affects the space below the work location (such as cutting openings in floor slabs, piping or conduit changes and additions, and similar operations), schedule and coordinate the performance of the work in advance with the Architect.

B. **Investigation**: Drill pilot holes for penetrations to identify possible conflicts with existing construction, prior to cutting openings.

C. **Related Removals**: Include the removal and reinstallation of ceiling finishes, light fixtures, pipes, ducts, conduit, and other construction below the penetrations as necessary to perform the work.

D. **Protection**: Provide and maintain suitable protection for the building and the Owner's property located on the lower floor.

3.10 REPAIRS

A. Promptly repair damage to adjacent facilities caused by demolition operations, at no additional cost to the Owner.
   1. Repair: Correct demolition performed in excess of that required. Return structures and surfaces indicated to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

3.11 DEBRIS AND WASTE REMOVAL

A. **Debris**: Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.

B. **Removal for Re-Installation**: Existing items as indicated shall be removed from existing locations and re-installed in the project area. Items involved will remain the property of the Owner. Contractor shall be responsible for the items from time of removal until acceptance of the project.

C. **Removal and Transportation**: Disconnect, remove and transport items for salvage and re-installation, including accessories and appurtenances, to prevent loss and damage. Before removal, document apparent damage and missing parts, which could be misconstrued as Contractor's responsibility, by photographs or written notes with acknowledgment by Architect. Cover and protect items until they are re-installed or delivered into Owner's storage.

D. Leave site in clean condition, ready for subsequent work.

E. Clean up spillage and wind-blown debris from public and private lands.

3.12 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.
   1. Upon completion of demolition work, remove tools, equipment and demolished materials from site. Remove protections and leave areas broom clean.
   2. Clean roadways of debris caused by debris transport.

3.13 COMPLETION

A. **Lay-Out**: Demolition and laying-out in both plan and elevation shall be completed for all major elements for each portion of the work, including mechanical, electrical and plumbing, prior to commencement of new work under this Contract.

B. **Inspection**: The Contractor shall inspect the completed demolition and lay-out to determine the nature and location of all conflicts between new and existing construction and request clarification from the Architect.

END OF SECTION

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DIVISION 3

CONCRETE

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SECTION 03 0505
UNDERSLAB VAPOR BARRIER

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Sheet vapor barrier under concrete slabs on grade.

1.3 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Preparation of subgrade, granular fill, placement of concrete.

1.4 REFERENCE STANDARDS

A. ASTM D 882-10 Standard Test Method for Tensile Properties of Thin Plastic Sheeting.

B. ASTM D 1709-09 Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method.

C. ASTM E 154- 08 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover.

D. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011.

E. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

F. ASTM F 1249-06 (2011) Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor.

G. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.

1.5 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Submit manufacturers' data on manufactured products.

C. Test Data: Submit report of tests showing compliance with specified requirements.
   1. Documentation to be from a third party, independant testing facility.

D. Submit documentation confirming that materials tested and supplied for the project are manufactured only with high grade prime, virgin (non-recycled), polyolefin resins.
   1. Recycled materials are not to be used on this project.

E. Samples: Submit samples of underslab vapor barrier to be used.

F. Manufacturer's Installations: Indicate installation procedures and interface required with adjacent construction.
   1. Include instructions for placement, seaming and penetration repair.

1.6 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain materials and accessories from a single manufacturer or a source approved by the manufacturer.

B. Install all materials and accessories as recommended by the manufacturer.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver products in manufacturer's original containers or packaging, dry and undamaged, with seals and labels intact and legible.
   1. Labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing.
   2. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above shall be automatically rejected and shall be removed and replaced at the Contractor's expense.
   3. Keep combustible materials away from ignition sources.

PART 2 PRODUCTS

2.1 MATERIALS

A. Underslab Vapor Barrier:
   1. Multi-layer plastic extrusion manfactured with only high grade prime, virgin (non-recycled), polyolefin resins.
      a. Recycled materials are not acceptable for use on this project.
   2. Water Vapor Permeance: Not more than 0.010 perms (0.6 ng/(s m2 Pa)), maximum.
   3. Complying with ASTM E1745 Class A.
   4. Thickness: 15 mils (0.4 mm).
   5. Basis of Design:
      a. Stego Industries LLC; Stego Wrap Vapor Barrier 15-mil: www.stegoindustries.com.
   6. Alternate Manufacturers:
      a. Reef Industries, Inc.; Griffolyn 15-mil: www.reefindustries.com.
      b. Fortifiber Building Systems Group; Moistop Ultra 15 Underslab Vapor Retarder 15-mil: www.fortifiber.com.
      c. Substitutions: See Section 01 6300 - Product Substitution Procedures.

B. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams, perimeter/edge seals, and penetrations in vapor barrier.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surface over which vapor barrier is to be installed is complete and ready before proceeding with installation of vapor barrier.

3.2 INSTALLATION

A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643-11.

B. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls.

C. Lap joints minimum 6 inches (150 mm).

D. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.

E. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.

F. Repair damaged vapor retarder before covering with other materials.

END OF SECTION

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SECTION 03 3000
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 01 Specifications apply to this Section.

1.2 SUMMARY

A. Section Includes: Cast-in-place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes, for the following:
   1. Footings.
   2. Foundations, grade beams, walls, and slabs.
   3. Equipment pads and bases.

B. Related Sections:
   1. Division 01Section - "Submittal Procedures".
   2. Section 01 4529 - Testing Laboratory Services.
   3. Section 03 3026 - Under Slab Vapor Barrier.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's descriptive literature and application recommendations for reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, and other proprietary materials and items if requested by Architect.

B. Shop Drawings: Submit details for fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures". Show bar schedules, spacing, bent bar diagrams, and arrangement of concrete reinforcement, ties, and stirrups. Include special reinforcing for openings through concrete.

C. Mix Design Data: Submit laboratory test reports or evaluation reports for concrete materials and each proposed concrete mix.
   1. The Contractor shall engage a testing agency acceptable to Architect to perform material evaluation tests and to design concrete mixes.
   2. Submit written mix design data at least 15 days prior to scheduled start of concrete placement.
   3. Do not begin concrete production until mix designs have been reviewed by the Architect.
   4. Submit aggregate test data indicating no potential for alkali-silica reactions.

D. Proposed construction joint locations at slabs.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following, except where more stringent requirements are shown or specified:
   1. ACI 301, "Specifications for Structural Concrete for Buildings".

2. ACI 318, "Building Code Requirements for Reinforced Concrete" IBC 2012 referenced Edition.
3. ACI 315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures".
4. 2012 International Building Code (IBC).
5. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice".

B. Concrete Testing Service: As specified in PART 3 of this Section.

PART 2 PRODUCTS

2.1 FORM MATERIALS

A. General: Furnish form materials capable of supporting construction loads in addition to weight of fresh concrete, without displacement or excessive deflection.

B. Forms for Exposed Concrete: Plywood, metal, or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints. Provide Class A formwork.

C. Forms for Unexposed Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit. Provide Class C formwork.

D. Form Release Agent: Commercial formulation that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

E. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties that will leave no metal closer than 1-1/2 inches to the exposed concrete surface.

2.2 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric sheets.

C. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and positioning reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.

1. For slabs-on-grade, use supports with sand plates or horizontal runners.
2. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I.

B. Fly Ash: ASTM C 618, Type C.

C. Normal-Weight Aggregates: Normal-Weight, ASTM C 33, except local aggregates proven by special tests or actual service to produce concrete of adequate strength and durability may be used, subject to acceptance by Architect.

D. Lightweight Aggregates: ASTM C330.

E. Water: Potable.

F. Slag: Not acceptable.

G. Micro-Fiber Reinforcement:

1. Synthetic Fiber: Fibrillated polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, ½ to 1 inch (13 to 25mm) long.
2. Products: Subject to compliance with requirements, provide one of the following:
   a. Fibrillated Fibers:
      1. Fibrasol F; Axim Concrete Technologies
      2. Fibermesh; Fibermesh, Div. of Synthetic Industries
      3. Forta CR; Forta Corporation
      4. Grace Fibers; W.R. Grace & Co., Construction Products Division

2.4 ADMIXTURES

A. General: Use only admixtures that have been accepted in mix designs. Use admixtures in accordance with manufacturer's directions and recommendations. Use water-reducing admixture in concrete, as necessary for placement and workability. Provide concrete admixtures that are compatible with other concrete ingredients and that contain not more than 0.1 percent chloride ions.
1. Use accelerating admixture in concrete placed at ambient temperatures below 50 deg F (10 deg C).
2. Use high-range water-reducing admixture (super plasticizer) in pumped concrete, concrete with water-cement ratios below 0.50, and elsewhere only as instructed.
3. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated, to result in concrete at point of placement having total air content from 2 to 4 percent.
4. For all concrete slabs exposed-to-view, including pavement-on-grade, use a shrinkage inhibiting admixture.

B. Air-Entraining Admixture: ASTM C 260.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Air-Mix or Perma-Air, Euclid Chemical Co.
   b. Darex AEA or Daravair, W.R. Grace & Co.
   c. Master Air AE-90, BASF Corporation.
   d. Sika AER, Sika Corp.

C. Water-Reducing Admixture: ASTM C 494, Type A.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Eucon WR-75, Euclid Chemical Co.
   b. WRDA, W.R. Grace & Co.
   c. Master Pozzolith, BASF Corporation.
   d. Plastocrete 161, Sika Corp.

D. High-Range Water-Reducing Admixture: (Superplasticizer) ASTM C 494, Type F or Type G. All pumped concrete shall contain a high range water-reducer (Superplasticizer) chloride free.
1. Products: Subject to compliance with requirements, provide one of the following:
   a. Eucon 37, Euclid Chemical Co.
   b. WRDA 19 or Daracem, W.R. Grace & Co.
   c. Master Rheobuild 1000 or Master Glenium, BASF Corporation.
   d. Sikament 300, Sika Corp.

E. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Accelguard 80, Euclid Chemical Co.
   b. Daraset, W.R. Grace & Co.
   c. Master Set AC-534 or Master Set FP-20, BASF Corporation.

F. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Eucon Retarder 75, Euclid Chemical Co.
      b. Daratard-17, W.R. Grace & Co.
      c. Master Set R or Master Set DELVO, BASF Corporation.
      d. Plastiment, Sika Corporation.

G. Shrinkage Inhibiting Admixture: Shrinkage reducing admixture shall be MasterLIFE SRA 20 manufactured by BASF Corporation or pre-bid approved equal. Dosage rate shall be in accordance with the manufacturer's recommendations for the designated usage with a maximum shrinkage allowance of .025% but not less than 1.5 gal./yd.

H. Crystalline waterproofing admixture shall be Xypex, Caltite, or prior approved equal. Admixture is required for concrete mixes at elevator pit walls, elevator pit slabs, and where otherwise indicated. Dosage shall be as recommended by the manufacturer for a water head pressure of 6ft. minimum.

2.5 RELATED MATERIALS

A. Expansion Joint Filler: Non-bituminous, non-extruding cork or rubber joint filler, ASTM D 1752. Joint sealants are specified in Section 07 9200.

2.6 CURING MATERIALS

A. Absorptive Cover: Burlap cloth weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

B. Moisture-Retaining cover: Waterproof paper, polyethylene film or polyethylene-coated burlap, complying with ASTM C 171.

2.7 SEALER

A. Seal Hard - L&M Chemical Co. or Ashford Formula - Curecrete Chemical Co., Inc.

2.8 ADHESIVE

A. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. HIT-HY 200, HILTI.
      b. SET-XP, Simpson Strong-Tie
      c. Sikadur 32 Hi-Mod, Sika Corp.

2.9 PROPORTIONING AND DESIGNING MIXES

A. General: Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. Comply with "SUBMITTALS" provisions in PART 1 of this Section.
   1. Limit use of fly ash to not exceed 25 percent of cement content by weight.
   2. Limit water/cement ratio of concrete exposed to freezing to 0.45.
   3. Limit water/cement ratio of first floor slab concrete to 0.45.

B. Slump Limits: Design mixes for concrete slump at point of placement as follows:
   1. Ramps, slabs, and sloping surfaces: Not more than 3 inches.
   2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
   3. Concrete containing high-range water-reducing admixture (super plasticizer): Not more than 8 inches after adding admixture to site-verified 2-to-3-inch slump concrete.
   4. Other concrete: Not more than 4 inches.

C. Adjustment to Concrete Mixes: Adjust mix design when characteristics of materials, job conditions, weather, test results, or other circumstances warrant. Do not use revised mix designs until test data and strength results have been submitted to and accepted by the Architect.

D. Concrete Exposure Categories and Classes:
   1. Freeze-thaw: F0
   2. Sulfate: S0
   3. Permeability: P0
   4. Corrosion Protection: C1

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Use ready-mixed concrete throughout, unless otherwise approved by the Architect. Comply with requirements of ASTM C 94, and as specified.

B. Hot Weather Mixing: When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

2.11 WATERSTOPS

A. Self-Expanding Strip Waterstops: Manufactured rectangular or trapezoidal strip, sodium bentonite or other hydrophilic material for adhesive bonding to concrete.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Volclay Waterstop-RX; Colloid Environmental Technologies Co.
      b. Conseal CS-231; Concrete Sealants Inc.
      c. Swellseal Joint; De Neef Construction Chemicals (U.S.) Inc.
      d. Hydrotite; Greenstreak.
      e. Mirastop; Mirafi Moisture Protection, Div. of Royal Ten Cate (USA), Inc.
      f. Adeka Ultra Seal; Mitsubishi International Corporation.
      g. Superstop; Progress Unlimited Inc.

PART 3 EXECUTION

3.1 GENERAL

A. Coordination: Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing steel.

B. Tolerances: Control form construction, reinforcement placement, and placing and finishing concrete to meet the following requirements in the completed construction.
   1. Slab Surfaces - Unless otherwise indicated the maximum variation from true plane and levelness will be as follows: Ff25; Fl20.
   2. Other Exposed Surfaces and Edges -
      a. Cross section dimension: Minus ¼", plus ½".
      b. Variation from indicated level: ±¼" in 10 feet; ± ½" max.
      c. Variation from plumb: ±¼" in 10 feet; ±½" max.
      d. Variation from true line: ±¼" in 10 feet; ±3/8" in 20 feet; ±½" max.
      e. Alignment of columns and walls (bottom versus top): ±½".
      f. Location in plan: ±½" in 20 feet; ±3/4" max.
   3. Reinforcement Placement -
      a. Concrete cover: Plus ¼", minus 0.
      b. Spacing of parallel bars: ±¼".
      c. Length of bars: ±1".
      d. Vertical or horizontal displacement: One bar diameter.

3.2 FORMS

A. General: Design, erect, support, brace, and maintain formwork to resist wind loads and to support vertical, lateral, static, and dynamic loads of concrete and subsequent operations until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position.

B. Formwork Tolerances: Maintain formwork construction tolerances and surface irregularities within ACI 347 limits:
   1. Provide Class A tolerances for concrete surfaces exposed to view.
   2. Provide Class C tolerances for other concrete surfaces.

C. Embedded Items: Set and build into formwork reglets, dovetail slots, anchorage devices, sleeves, and other embedded items for 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.

D. Formwork Construction: Fabricate forms for easy removal without hammering or prying against concrete surfaces. Kerf wood inserts for keyways, reglets, recesses, and similar features for easy removal.
   1. Provide necessary temporary openings for clean-outs and inspections before and during concrete placement. Locate temporary openings at inconspicuous locations.
   2. Chamfer exposed corners and edges as indicated.
   3. Apply form release agent or wet forms as necessary.

E. Provisions for Other Trades: Provide openings in formwork to accommodate work of other trades. Accurately place and securely support sleeves and other items built into forms.
   1. The forming Contractor shall coordinate slab and beam blockouts and weld plates with the exterior wall manufacturer.

F. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and securely support screed strips for use with strike-off templates or compacting-type screeds.

G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces prior to concrete placement. Retighten forms and bracing during placement if necessary to prevent mortar leaks and maintain proper alignment.

H. Under Slab Vapor Barrier: Provide in accordance with Section 03 3026.

I. Earth Cuts as Forms: All concrete construction must be non-earth formed. Earth cuts will only be acceptable in lieu of forms where Drawings indicate slanted sides of a concrete member. The Contractor shall provide necessary dewatering or dry bottoms without additional cost to the Owner.

3.3 REINFORCEMENT

A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for details and methods of reinforcement placement and supports.
   1. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
   2. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, and wire ties. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
   3. Maintain minimum coverage as indicated.

B. Welded Wire Fabric: Install welded wire fabric sheets in lengths as long as practicable. Lap two full squares and tie splices with wire. Offset laps of adjoining widths to prevent continuous laps in both directions.

C. Micro-Fiber Reinforcement: Add to mix at a rate of 1.5 lb. per cubic yard. Fiber reinforcement is required in all exterior exposed-to-view, pile supported concrete slabs.

3.4 JOINTS

A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure.
   1. Provide keyways at least 1-1/2 inches deep in construction joints.
   2. Place construction joints perpendicular to main reinforcement and continue reinforcement across construction joints unless indicated otherwise.
   3. Use bonding agent on concrete surfaces that will be joined with fresh concrete.

3.5 CONCRETE PLACEMENT

A. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete". Deposit concrete continuously so that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified.
   1. Deposit concrete to avoid segregation at its final location.
   2. Maintain reinforcing in proper position during concrete placement.

B. Consolidation: Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping in compliance with ACI 309. Do not use vibrators to transport concrete inside forms. Limit vibration to time necessary to

consolidate concrete and embed reinforcement and other items without causing mix to segregate.

C. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

D. Cold-Weather Placement: Comply with ACI 306 and the following. Protect concrete work from physical damage or reduced strength from frost, freezing actions, or low temperatures.
   1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
   2. Do not use calcium chloride, salt, or other antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

E. Hot-Weather Placement: Comply with ACI 305 and the following. Protect concrete work from reduced strength and impaired quality from too-rapid drying and elevated temperature.
   1. Water-fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
   2. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, if acceptable to Architect.

3.6 FORMED SURFACES FINISHES

A. Rough-Formed Finish: Provide concrete surfaces not exposed to view in the finished construction with texture imparted by form material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding ¼ inch in height rubbed down or chipped off.

B. Smooth-Formed Finish: Provide concrete surfaces exposed to view or to be covered with a coating or covering material applied directly to concrete (such as waterproofing, dampproofing, veneer plaster, or similar system), with an as-cast surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective concrete areas. Fins and other projections shall be completely removed and smoothed.

C. Smooth-Rubbed Finish: Provide smooth-rubbed finish within 24 hours after form removal on concrete surfaces to be painted or left exposed at occupied rooms and spaces in the completed construction. In addition to smooth-formed finish as specified, moisten concrete surfaces and rub with carborundum brick or another abrasive to produce a uniform color and texture. 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 adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces.

E. Verify formed surface finish requirements with Project Architect prior to construction.

3.7 MONOLITHIC SLAB FINISHES

A. General: Verify required slab finishes with Architect before concrete is placed. Slope surfaces uniformly to drains where required.

B. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and where indicated. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.

C. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing and roof insulation, or sand-bed terrazzo; and where indicated.
   1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared and concrete has stiffened sufficiently to permit operation of power-driven floats. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Produce a uniform, smooth, granular texture.
   2. Finish surfaces to tolerances specified. Cut down high spots and fill low spots; refloat such corrections.

D. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, adhesive-set ceramic or quarry tile, paint, or other thin-film coating system or adhesive-set finish.
   1. After floating, begin first trowel-finish operation using a power-driven trowel 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.
   2. Finish surfaces to tolerances specified. After concrete has hardened, grind smooth surface defects that would telegraph through applied floor covering system.

E. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply a trowel finish as specified, then immediately follow by slightly scarifying the surface with a fine broom.

F. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated. Uniformly slope exterior surfaces to eliminate "bird baths". Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.8 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 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 by 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. Comply with diagrams or templates of manufacturer furnishing machines and equipment.

D. Moisture Testing: Moisture testing shall begin a minimum of 90 days prior to flooring installation to properly allow the contractor to schedule appropriate mitigation if needed.

3.9 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from physical damage, premature drying and excessive cold or hot temperatures.

B. Initial Curing: Begin curing as soon as free water has disappeared from concrete surface after placing and finishing. Continue curing for not less than 7 days.

C. Curing Methods: Cure concrete by one or a combination of the following methods.
   1. Continuous water-fog spray, or completely cover with specified absorptive cover, thoroughly saturated with water and kept continuously wet, with sides and ends lapped 4 inches.
   2. Cover with moisture-retaining cover with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

D. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. After forms are removed, continue curing by methods specified above, as applicable.

3.10 REMOVING FORMS

A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar elements, may be removed 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may be removed when concrete has attained at least 75 percent of specified 28-day compressive strength.

B. Form Re-Use: Clean and repair surfaces of forms to be reused. Split, frayed, delaminated, or otherwise damaged form material will not be acceptable. Apply new form-coating compound.

C. Extending Formed Surfaces: When forms are extended for successive concrete placement, thoroughly clean forms and in-place concrete surfaces, remove fins and latence, and tighten forms to close joints. Align and secure forms to avoid offsets.

3.11 CONCRETE REPAIRS

A. Patching Defective Areas: Immediately after removing forms, repair and patch defective areas with cement mortar consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only the amount of water necessary for handling and placing.
   1. Patch voids over ¼ inch in any dimension and holes left by tie rods and bolts. Cut down to solid concrete, but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface.
   2. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.
   3. Correct high areas in formed and unformed surfaces by grinding after concrete has cured at least 14 days.
   4. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing with fresh

concrete. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect.

B. Replacing Defective Areas: Remove and replace defective concrete if defects cannot be satisfactorily patched. Defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Remove defective areas 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 apply bonding agent. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
2. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

3.12 FIELD QUALITY CONTROL TESTING

A. General: The contractor compensated Independent Testing Lab shall perform tests and submit test reports. Minimum testing will be as specified below. Additional testing may be ordered by the Owner or Architect.

B. Minimum Testing: Sampling and testing for quality control during concrete placement will include 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. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed.
4. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 50 cu. yd. 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.
5. Flatness and levelness testing of slabs is required.

C. Random Sampling: When specified frequency of testing will provide fewer than five sets of cylinders for a given class of concrete, obtain samples and conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.

D. Reporting: Test results will be reported in writing to Architect, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests.

E. Additional Tests: The testing agency may 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, by cored cylinders complying with ASTM C 42, or by other methods as directed.

END OF SECTION

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SECTION 03 5400
CAST UNDERLAYMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Liquid-applied self-leveling floor underlayment.
   1. Use cementitious type at slab areas that are not in compliance with tolerences for floor levelness.

1.3 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.

B. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2014.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

1.4 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on surface preparation, environmental limitations, and installation instructions.

C. Certificate: Certify that products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in performing the work of this section, and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F (41 degrees C).

1.7 MOCK-UP

A. Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Prepare mock-up in location designated by Architect.
   2. Area: 6 ft by 6 ft (2 m by 2 m).
      a. Minimum.
   3. Do not proceed with underlayment work until workmanship of mock-up has been approved by Architect.

B. Mock-up may remain as part of the Work.

1.8 FIELD CONDITIONS

A. Do not install underlayment until floor penetrations and peripheral work are complete.

B. Maintain minimum ambient temperatures of 50 degrees F (10 degrees C) 24 hours before, during and 72 hours after installation of underlayment.

C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Cementitious Underlayment:
   1. ARDEX Engineered Cements; ARDEX K 15 with ARDEX MC RAPID: www.ardexamericas.com.
   2. LATICRETE International, Inc.; LATICRETE SUPERCAP SC500 with LATICRETE SUPERCAP Primer Plus: www.laticrete.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.2 MATERIALS

A. Cast Underlayments, General:
   1. Conform to applicable code for combustibility or flame spread requirements.

B. Cementitious Underlayment: Blended cement mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
   1. Compressive Strength: Minimum 4000 psi (27.6 MPa) after 28 days, tested per ASTM C109/C109M.
   2. Flexural Strength: Minimum 1000 psi (6.9 MPa) after 28 days, tested per ASTM C348.
   3. Final Set Time: 1-1/2 to 2 hours, maximum.
   4. Thickness: Capable of thicknesses from feather edge to maximum 3-1/2 inch (89 mm).
      a. With addition of manufacturer recommended aggregate.

5. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.

C. Aggregate: Dry, well graded, washed silica aggregate, approximately 1/8 inch (3 mm) in size and acceptable to underlayment manufacturer.

D. Reinforcement: Galvanized metal lath complying with recommendations of underlayment manufacturer for specific project circumstances.

E. Water: Potable and not detrimental to underlayment mix materials.

F. Primer: Manufacturer's recommended type.

G. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.

2.3 MIXING

A. Site mix materials in accordance with manufacturer's instructions.

B. Add aggregate for areas where thickness will exceed 1/2 inch (12.7 mm). Mix underlayment and water for at least two minutes before adding aggregate, and continue mixing to assure that aggregate has been thoroughly coated.

C. Mix to self-leveling consistency without over-watering.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

3.2 PREPARATION

A. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.

B. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.

C. Vacuum clean surfaces.

D. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

E. Close floor openings.

3.3 APPLICATION

A. Install underlayment in accordance with manufacturer's instructions.

B. Pump or pour material onto substrate. Do not retemper or add water.
   1. Pump, move, and screed while the material is still highly flowable.
   2. Be careful not to create cold joints.
   3. Wear spiked shoes while working in the wet material to avoid leaving marks.

C. Place to manufacturer's recommended thickness thickness, with top surface level to 1/8 inch in 10 ft (1:1000).

D. For final thickness over 1-1/2 inches (38 mm), place underlayment in layers. Allow initial layer to harden to the point where the material has lost its evaporative moisture. Immediately prime and begin application of the subsequent layer within 24 hours.

E. Place before partition installation.

F. Where additional aggregate has been used in the mix, add a top layer of neat mix (without aggregate), if needed to level and smooth the surface.

G. If a fine, feathered edge is desired, steel trowel the edge after initial set, but before it is completely hard.

3.4 CURING

A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.

B. Air cure in accordance with manufacturer's instructions.

3.5 FIELD QUALITY CONTROL

A. An independent testing agency will perform field inspection and testing, as specified in Section 01 4000.
   1. All associated costs for inspection and testing will be paid by the Contractor.

3.6 PROTECTION

A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.

B. Do not permit traffic over unprotected floor underlayment surfaces.

END OF SECTION

DIVISION 4

MASONRY

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SECTION 04 2000
UNIT MASONRY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Concrete Block.

B. Mortar and Grout.

C. Reinforcement and Anchorage.

D. Flashings.

E. Accessories.

1.3 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Nailing strips built into masonry.

B. Section 07 6200 - Sheet Metal Flashing and Trim.

C. Section 07 2100 - Thermal Insulation: Insulation for cavity spaces.

D. Section 07 8400 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.

E. Section 07 9005 - Joint Sealers.

F. Section 08 1113 - Hollow Metal Doors and Frames.

G. Section 08 4313 - Aluminum-Framed Storefronts.

H. Section 09 2116 - Gypsum Board Assemblies: Gypsum board substrate at interior thin brick installation.

1.4 REFERENCE STANDARDS

A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

E. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2014.

F. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2014.

G. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.

H. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

I. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

J. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.

K. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

L. ASTM C476 - Standard Specification for Grout for Masonry; 2010.

M. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2012.

N. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.

O. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2008) .

P. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2012.

Q. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength; 2009.

R. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2014.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.6 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. See Section 01 3300 - Submittal Procedures.

C. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

D. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.

E. Manufacturer's Certificate: Certify that masonry units and and associated accessories meet or exceed specified requirements.

F. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

G. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.7 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.
   1. Maintain one copy of each document on project site.

B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

1.8 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet (2.4 m) long by 8 feet (2.4 m) high; include mortar, accessories, structural backup, and flashings (with lap joint, corner, and end dam) in mock-up.
   1. Clean one-half of exposed faces of panels with masonry cleaner indicated.
   2. Protect approved sample panels from the elements with weather-resistant membrane.
   3. Approval of sample panels is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
      a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless such deviations are specifically approved by Architect in writing.

4. Architect to approve mock-up prior to commencement of masonry work.

B. Locate where directed by the Architect.

C. Mock-up may remain as part of the Work.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
   1. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Handle and store manufactured stone masonry in protective packaging. Do not remove from protective packaging until ready for installation.

C. Store manufactured stone masonry units in a manner to prevent damage and staining of units. Stack units on timbers or platforms at least 3 inch (76 mm) above grade. Place polyethylene or other plastic film between wood and other finished sufaces of units when stored for extended periods of time. Stored units should be covered if exposed to extreme weather conditions.

D. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

E. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

F. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

G. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.10 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
   1. Extend cover a minimum of 24 inches (600mm) down both sides and hold cover securely in place.
   2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600mm) down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor and roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, and soil that come in contact with such masonry.
   1. Protect base of walls from rain-splashed mud and from mortar splatter by coverings spread on ground and over wall surface.
   2. Protect sills, ledges, and projections from mortar droppings.
   3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.

PART 2 PRODUCTS

2.1 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

2.2 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Integrally Colored: Units shall be manufactured with integral colors produced using permanent natural and synthetic pigments, compounded for use in concrete products and having record of satisfactory performance.
   2. Size: Standard units with nominal face dimensions of 16 x 8 inches (400 x 200 mm) and nominal depth of 4 inches (100 mm).
   3. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, control joint edges, and other detailed conditions.
   4. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block, as indicated.
      b. Exposed Faces: Special color and texture, as follows: to match existing.
         1) Texture: Split-face units with natural cleft surface texture produced by 4-way power splitters.
         2) Color: As selected by Architect from manufacturer's full range.
   5. Units with Integral Water Repellent: Concrete block units as specified in this section with polymeric liquid or powder admixture added to concrete masonry units at the time of manufacture.
      a. Performance of Units with Integral Water Repellent:
         1) Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours.
            (a) No water visible on back of wall above flashing at the end of 24 hours.
            (b) No flow of water from flashing equal to or greater than 0.032 gallons per hour (0.05 L per hour) at the end of 24 hours.
            (c) No more than 25% of wall area above flashing visibly damp at end of test.
         2) Flexural Bond Strength: ASTM C1357; minimum 10% increase.
         3) Compressive Strength: ASTM C1314; maximum 5% decrease.
         4) Drying Shrinkage: ASTM C1148; maximum 5% increase in shrinkage.

b. Use only in combination with mortar and grout that also has integral water repellent admixture.
c. Use water repellent admixtures for masonry units, mortar and grout by a single manufacturer.
d. Manufacturers:
   1) State Block, Inc.: www.stateblock.com. **BASIS OF DESIGN.**
   2) Trenwyth Industries, Inc., an Oldcastle Company: www.trenwyth.com.
   3) Anchor Concrete Products, Inc., an Oldcastle Company: www.oldcastlemasonry.com.
   4) Substitutions: See Section 01 6000 - Product Requirements.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
   1. Not more than 0.60 percent alkali.

B. Hydrated Lime: ASTM C207, Type S.

C. Mortar Aggregate: ASTM C144.

D. Grout Aggregate: ASTM C404.

E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979.
   1. Color(s): As selected by Architect from manufacturer's full range.
   2. Manufacturers:
      a. Holcim (US), Inc.: Envirocore Mortamix Rainbow Custom Color Masonry Cement: www.holcim.us.
      b. Lafarge Corporation; Centurion Colorbond PL: www. lafarge.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.

F. Water: Clean and potable.

2.4 REINFORCEMENT AND ANCHORAGE

A. Manufacturers of Joint Reinforcement and Anchors:
   1. Blok-Lok Limited: www.blok-lok.com.
   2. Hohmann & Barnard, Inc (including Dur-O-Wal brand): www.h-b.com.
   3. WIRE-BOND: www.wirebond.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa), deformed billet bars; galvanized.

C. Two-Piece Wall Ties: Formed steel wire, 0.1875 inch (4.8 mm) thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A153/A153M, Class B, sized to provide not more than 1 inch (25 mm) and not less than 1/2 inch (13 mm) of mortar coverage from masonry face and to allow vertical adjustment of up to 1-1/4 in (32 mm).

1. **BASIS OF DESIGN**: Hohmann & Barnard, Inc.; HB-200-X Veneer Anchors: www.h-b.com.
2. Alternate Manufacturers:
   a. Blok-Lok; BL-200X Veneer Anchors: www.blok-lok.com.
   b. Wirebond; #2411 HCL-711 Adjustable Veneer Anchor: www.wirebond.com.

2.5 FLASHINGS

A. Stainless Steel Flashing: ASTM A666, Type 304, soft temper; 26 gage, 0.0187 inch (0.48 mm) thick; finish 2B to 2D.
   1. Drip Plate furnished with a smooth, factory-formed hemmed edge.
      a. Width: 1-1/2 inch (25 mm).
   2. Provide manufactured formed drip plate corners at all "inside" and "outside" corner conditions.
   3. Provide manufactured end dams at all lintels as required.
   4. Lap drip plates 4 inch (102 mm) minimum with a bead of manufacturer's recommended sealant between and at edges of laps.
   5. Set system in manufacturer's recommended mastic.
   6. Install per manufacturer's instructions.
   7. Manufacturers:
      a. Hohmann & Barnard, Inc.; Sandell Moisture Protection Systems, Drip Plate System: www.h-b.com. **BASIS OF DESIGN**.
      b. Blok-Lok; Drip Plate: www.blok-lok.com.
      c. Wirebond; #4165 Drip Edge Flashing: www.wirebond.com.

B. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

2.6 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:
      a. Blok-Lok Limited; RS Series Rubber Control Joint: www.blok-lok.com.
      b. Hohmann & Barnard, Inc (including Dur-O-Wal brand); RS Series - Rubber Control Joint: www.h-b.com.
      c. WIRE-BOND: www.wirebond.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

B. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
   1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.
      a. Manufacturers:
         1) Mortar Net Solutions; Mortar Net with Insect Barrier: www.mortarnet.com.
         2) Blok-Lok Limited; Mortar Mitt: www.blok-lok.com.
         3) Hohmann & Barnard, Inc.; Mortar Web: www.h-b.com.

4) Wire-Bond; Cavity Net DT: www.wire-bond.com
5) Substitutions: See Section 01 6000 - Product Requirements.

C. Termination Bars: Stainless steel; compatible with membrane and adhesives.

D. Cavity Vents: Molded PVC grilles, insect resistant.
1. Manufacturers:
a. Blok-Lok Limited; CellVent: www.blok-lok.com.
b. Hohmann & Barnard, Inc; QV- Quadro-Vent: www.h-b.com.
c. WIRE-BOND; #3601 Cell Vent: www.wirebond.com.
d. Color to be selected from manufacturer's full range.
e. Substitutions: See Section 01 6000 - Product Requirements.

E. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.
1. Proprietary Acidic Cleaner: Manufacturer’s standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
2. Do not pressure wash.

2.7 MORTAR AND GROUT MIXES

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
1. Exterior, non-loadbearing masonry: Type S or Type N.
a. As recommended by manufacturer for each type of masonry.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.
1. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979.
2. Manufacturers:
a. Holcim (US), Inc.: Envirocore Mortamix Rainbow Custom Color Masonry Cement: www.holcim.us.
b. Lafarge Corporation; Centurion Colorbond PL: www. lafarge.com.
3. Substitutions: See Section 01 6300 - Product Substitution Procedures.

C. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm).
1. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143/C.

D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.3 COLD AND HOT WEATHER REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

3.4 CUTTING MASONRY UNITS

A. Cut masonry units with wet-saw.

B. Pre-soak units using clean water prior to cutting.

C. Clean cut units using a stiff fibre brush and clean water. Allow units to surface dry prior to placement.

D. Finish cut edges to match face when exposed in wall.

3.5 WETTING MASONRY UNITS

A. Where the ambient air temperature exceeds 100°F or exceeds 90°F with a wind velocity greater than 8 mph, pre-wet masonry units.

B. Lay wetted units when surface dry.

3.6 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints,

returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Lay exposed masonry in bond pattern indicated; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

C. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

D. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

E. Provide joint reinforcing at all wall intersections.

3.7 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches (200 mm).
   3. Mortar Joints: Concave.

3.8 PLACING AND BONDING

A. Lay hollow masonry units with face shell bedding on head and bed joints.

B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

C. Remove excess mortar and mortar smears as work progresses.

D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.

E. Interlock intersections and external corners.

F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

H. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

3.9 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches (600 mm) on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

3.10 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.11 REINFORCEMENT AND ANCHORAGE - GENERAL

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches (400 mm) on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches (150 mm).

E. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 24 inches (600 mm) horizontally and 16 inches (400 mm) vertically.

3.12 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Install horizontal joint reinforcement 16 inches (400 mm) on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches (150 mm).

E. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches (400 mm) on center vertically and 24 inches (600 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.

3.13 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches (152 mm) into adjacent masonry or turn up at least 8 inches (203 mm) to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Extend metal flashings to within 1/4 inch (6 mm) of exterior face of masonry.

C. Lap end joints of flashings at least 6 inches (152 mm) and seal watertight with manufacturer recommended flashing sealant/adhesive.

D. Provide formed end dams at all flashings at openings as required.
   1. Turn-up flashing 2 inch (51 mm), minimum, at each end and seal watertight with manufacturer recommended flashing sealant/adhesive as instructed by manufacturer.

3.14 GROUTED COMPONENTS

A. Lap splices minimum 48 bar diameters.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.

C. Place and consolidate grout fill without displacing reinforcing.

3.15 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Form expansion joint as detailed on drawings.

3.16 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
   1. Fill adjacent masonry cores with grout minimum 12 inches (300 mm) from framed openings.

D. Do not build into masonry construction organic materials that are subject to deterioration.

3.17 TOLERANCES

A. Maximum Variation from Alignment of Columns and Pilasters: 1/4 inch (6 mm).

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft (6 mm/3 m) and 1/2 inch in 20 ft (13 mm/6 m) or more.

D. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft (3 mm/m) and 1/4 inch in 10 ft (6 mm/3 m); 1/2 inch in 30 ft (13 mm/9 m).

F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch (minus 6.4 mm, plus 9.5 mm).

G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch (6 mm).

3.18 CUTTING AND FITTING

A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.19 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

C. Testing Frequency: Tests and Evaluations listed in this Article will be performed during construction for each 5000 sq. ft. (460 sq. m) of wall area or portion thereof.

D. Grout Testing: Grout will be sampled and tested for compressive strength per ASTM C 1019.

E. Evaluation of Quality-Control Tests: In the absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality-control tests comply with minimum requirements indicated.

3.20 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point-up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants

3.21 CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears prior to tooling joints.

B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
   1. Remove excess mortar and mortar droppings.
   2. Replace defective mortar. Match adjacent work.
   3. Clean soiled surfaces with cleaning solution as recommended by manufacturer.
      a. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
      b. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
      c. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

C. Use non-metallic tools in cleaning operations.

3.22 MASONRY WASTE DISPOSAL

A. Excess Masonry Waste: Remove excess masonry waste and legally dispose of off Owner's property.

3.23 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION

DIVISION 5

METALS

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SECTION 05 1200
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 REALTED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 01 Specifications apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Scope: The Contract Drawings, including schedules, notes and details, show size and location of members, typical connections, and type of steel required. This Section includes all structural steel work as defined in American Institute of Steel Construction (AISC) "Code of Standard Practice" and as shown on Drawings.

B. Related Sections:
   1. Division 01 Section - "Submittal Procedures".
   2. Section 01 4529 —Testing Laboratory Services.
   3. Section 03 3000 — Cast-In-Place Concrete.
   4. Section 05 3100 —Steel Decking.

C. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Promptly notify Architect whenever design of members and connections for any portion of structure are not clearly indicated. Unless otherwise noted on the Drawings, all connections shall develop one-half of the total allowable uniform load capacity of the beam for the given span in the AISC Manual of Steel Construction Beam Tables. Greater loadings will be shown on the Drawings.
   1. The design adequacy of any detail configuration of connections developed by the fabricator as part of the preparation of Shop Drawings and fabrication of material is not the responsibility of the Owner, Architect, or Architect's consultants.
   2. Paragraph 4.2.1 of the AISC "Code of Standard Practice" referenced herein is hereby amended accordingly to eliminate the acceptance of this responsibility by the Owner, the Architect, and the Architect's consultants as a result of the review and approval of Shop Drawings.

1.3 SUBMITTALS

A. General: Submit the following in accordance with Section 01 3300. (Hard copies are required.)

B. Product Data: Producer's or manufacturer's specifications, installation instructions, laboratory test reports and other data to show compliance with specifications (including specified standards) for following products:
   1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
   2. High-strength bolts (each type), including nuts and washers.
   3. Structural steel primer paint.

4. Shrinkage-resistant grout.

C. Shop Drawings: Complete details and schedules for fabrication and assembly of structural steel members.
   1. Include details of cuts, connections, camber, holes, and other pertinent data.
   2. Indicate welds by standard AWS symbols. Show size, length, and type of each shop and field weld.
   3. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of other Sections.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:
   1. AISC "Code of Standard Practice for Steel Buildings and Bridges."
   2. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings", including "Commentary" and Supplements thereto as issued.
   3. AISC "Specifications for Architecturally Exposed Structural Steel."
   4. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Structural Connections.
   5. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel."
   6. ASTM A 6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use."

B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."
   1. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.
   2. If recertification of welders is required, retesting will be Contractor's responsibility.

C. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in mill, shop and field, conducted by inspection agency specified in Section 01 4529. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements. Promptly remove and replace materials or fabricated components which do not comply.

1.5 DELIVERY, STORAGE AND HANDLING

A. Delivery Schedule and Sequence:
   1. Deliver materials to site at such intervals to insure uninterrupted progress of work.
   2. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay work.

B. Storage and Handling: Comply with applicable requirements of Section 01600 and the following.
   1. Store materials to permit easy access for inspection and identification.
   2. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.

3. Do not store materials in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.
3. Handle materials to avoid damage to materials and other construction.

PART 2 PRODUCTS

2.1 MATERIALS

A. General: For work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, General: For work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names and roughness. prior to cleaning, treating and application of surface finishes. All steel shall be produced and fabricated from sources in the United States.

B. Structural Steel Shapes: ASTM A572-50. (ASTM A992 for wide-flange).

C. Rods and Bars: ASTM A36.

D. Plate: ASTM A36 and ASTM A572-50 as indicated on Drawings.

E. Hollow Structural Sections (HSS): ASTM A 500, Grade B.

F. Anchor Bolts: ASTM F1554, nonheaded type unless otherwise indicated.

G. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low-carbon steel bolts and nuts. Provide either hexagonal or square, heads and nuts, except use only hexagonal units for exposed connections.

H. High-Strength Threaded Fasteners: Quenched and tempered medium-carbon steel heavy hexagon structural bolts, heavy hexagon nuts and hardened washers, complying with ASTM A 325.
   1. Where indicated to be galvanized, provide bolts, nuts and washers zinc coated by hot-dip galvanizing (ASTM A 153) or by mechanical depositing (ASTM B 695, Class 50).

I. Electrodes for Welding: Comply with AWS Code.

J. Structural Steel Primer Paint:
   1. SSPC - Paint 25 at all steel not exposed to view in the final structure and not scheduled to receive spray applied fireproofing or be galvanized.

K. Cement Grout: Portland cement (ASTM C 150, Type I or Type III) and clean, uniformly graded, natural sand (ASTM C 404, Size No. 2). Mix at a ratio of 1.0 part cement to 3.0 parts sand, by volume, with minimum water required for placement of hydration.

L. Non-Metallic Shrinkage-Resistant Grout:
   1. Pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water reducing agents, complying with CE-CRD-C621.
   2. Subject to compliance with requirements, products which may be used include, but are not limited to, the following:
      a. Euco N. S.; Euclid Chemical Company.
      b. Crystex; L & M Construction Chemicals.
      c. Masterflow 713; Master Builders.
      d. Sonogrout G.P.; Sonneborn Building Products.
      e. Five Star Grout; U. S. Grout Corp.

M. Shear studs: Shear Studs: Shall be shear connectors with proper ferrules and accessories, especially designed to create composite action between concrete and the supporting beam. Steel for studs shall conform to ASTM A 108, Grades 1015-1020, with a minimum tensile strength of 60,000 psi. Studs shall be of uniform diameter, heads shall be concentric and normal to shaft and the weld end shall be chamfered, welds shall be solid flux.

2.2 FABRICATION

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.
   1. Properly mark and match - mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
   2. Where shop painting or galvanizing is required, complete assembly, including welding of units, before start of surface preparation for painting or galvanizing.
   3. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

B. Connections: Weld or bolt shop connections, as indicated.
   1. Bolt field connections, except where welded connections or other connections are indicated.
   2. Provide high-strength threaded fasteners for all bolted connections, except where unfinished bolts are indicated.

C. High-Strength Bolted Construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts."

D. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work. Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.

E. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.
   1. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other work.
   2. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

2.3 PROTECTIVE COATINGS

A. General: Shop paint structural steel, except galvanized items and members or portions of members to be embedded in concrete and members to receive sprayed on fire proofing. Paint steel which is partially embedded on exposed portions and initial 2" of embedded areas only. Verify primer compatibility with Division 9 requirements.
   1. Do not paint surfaces which are to be welded or high-strength bolted with friction-type connections.
   2. Apply two (2) coats of paint to surfaces which are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

B. Surface Preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Clean steel in accordance with the following Steel Structures Painting Council (SSPC) specifications:
   1. Nuts and bolts are to be cleaned in accordance with SSPC-SP1 prior to shop painting to completely remove all oil, dirt, grease and all other soluble surface contaminants.

C. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and at a rate to provide dry film thickness of not less than 1.5 mils for SSPC-Paint 25. Use painting methods that will result in full coverage of joints, corners, edges and exposed surfaces.

D. Galvanizing: ASTM A123/123M and ASTM A153/153M for threaded fasteners. Galvanizing repair compound shall be a two-component zinc-rich paint, ASTM A 780.

PART 3 EXECUTION

3.1 ERECTION

A. Examination: Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been agreed upon with Architect.

B. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

C. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces; remove bond-reducing materials and roughen to improve bond. Clean contact surfaces of base and bearing plates.
   1. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.
   2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
   3. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow it to cure. For proprietary grout materials, comply with manufacturer's instructions.

D. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust members before permanently fastening. Before assembly, clean bearing surfaces and other surfaces which will be in permanent contact. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
   2. Level and plumb individual members of structure within specified AISC tolerances.
   3. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

4. Splice members only where indicated and accepted on shop drawings.

E. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.

F. Bolted Connections: Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

G. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members which are not under stress, as acceptable to Architect. Finish gas-cut sections, when permitted, equal to a sheared appearance.

H. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas.

1. Apply paint to exposed areas of shop primed items, using same material as used for shop painting, by brush or spray to provide a minimum dry film thickness of 1.5 mils.

I. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Shop weld shear connectors, shaped as shown, to beams and girders in composite construction which do not support metal deck. Use automatic end welding of headed stud shear connectors in accordance with manufacturer's printed instructions.

1. Installation of Shear Connectors: Shear studs shall be automatically end welded in the shop in accordance with Article 31 of the AWS Structural Welding Code and the specifications of the shear stud manufacturer. After installation, each ceramic ferrule shall be removed prior to placement of concrete. Adequate welding power must be available for studs being welded.
2. All areas to which studs are to be attached shall be cleaned of all rust, oil, grease, and paint. When the mill scale is sufficiently thick to cause difficulty in obtaining proper welds, it shall be removed by grinding or sand blasting.

3.2 QUALITY CONTROL

A. The independent testing and inspection agency specified in Section 01 4529 shall inspect high-strength bolted and welded connections, perform tests, and submit test reports.

1. Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations there from.
2. Inspect structural steel at plant before shipment.
3. Architect reserves right, at any time before final acceptance, to reject material not complying with specified requirements.

B. Contractor's Responsibilities: Correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any noncompliance of original work, and as may be necessary to show compliance of corrected work.

C. Shop Bolted Connections: Inspect in accordance with AISC specifications. Verify that gaps of installed Direct Tension Indicators are less than gaps specified in ASTM F 959, Table 2.

D. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Perform visual inspections of all welds.
3. Perform tests on all full-penetration welds as follows: Inspection procedures listed are to be used at Laboratory's option.
   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 109; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.
   c. Radiographic Inspection: ASTM E 94 and ASTM E 142; minimum quality level "2-2T".
   d. Ultrasonic Inspection: ASTM E 164.

E. Field Bolted Connections: Testing Laboratory shall inspect in accordance with AISC Specifications. Verify that gaps of installed Direct Tension Indicators are less than gaps specified in ASTM F 959, Table 2.

F. Field Welding: Testing Laboratory shall inspect and test during erection of structural steel as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Perform visual inspection of all welds.
3. Perform tests on all full-penetration welds and other welds as required by AISC, as follows:
   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 109; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.
   c. Radiographic Inspection: ASTM E 94 and ASTM E 142; minimum quality level "2- 2T."
   d. Ultrasonic Inspection: ASTM E 164.

END OF SECTION

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SECTION 05 3100
STEEL DECKING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 01 Specifications apply to this Section.

1.2 SUMMARY

A. Section Includes: Steel deck units for roof applications.
B. Related Sections:
1. Division 01 Section – “Submittal Procedures”.
2. Section 01 4529 - Testing Laboratory Services.
3. Section 05 1200 - Structural Steel Framing.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories.
B. Shop Drawings: Submit shop drawings showing layout and types of deck units, anchorage details, and conditions requiring closure strips, supplementary framing, cant strips, cut openings, special jointing and other accessories.

1.4 QUALITY ASSURANCE

A. Codes and Standards: Comply with the following codes and standards, except as otherwise indicated:
1. American Iron and Steel Institute (AISI), "Specification for the Design of Cold-Formed Steel Structural Members".
2. American Welding Society (AWS), D1.3 "Structural Welding Code - Sheet Steel".
3. Steel Deck Institute (SDI), "Design Manual for Composite Decks, Form Decks and Roof Decks".

B. Qualification of Field Welding: Use qualified welding processes and welding operators in accordance with "Welder Qualification" procedures of AWS.
C. Underwriters' Label: Provide metal floor deck units listed in Underwriters' Laboratories "Fire Resistance Directory", with each deck unit bearing the UL label and marking for specific system detailed.
D. FM Listing: Provide metal roof deck units that have been evaluated by Factory Mutual System and are listed in "Factory Mutual Approval Guide" for "Class I" fire-rated construction.
E. Testing: Refer to “Section 01 4529 - Testing Laboratory Services”.

1.5 JOB CONDITIONS

A. Coordination: Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading structural members.

B. Safety: Do not use deck for storage or working platforms until units are permanently secured. Do not permit storage and operations on installed deck which could damage or deform the deck units.

C. Deck Insulation: Coordinate and cooperate with roof insulation installer to provide deck satisfactory for application of insulation. Provide manufacturer's insulation inserts at acoustical deck.

D. Ceiling Hangers: Coordinate and cooperate with ceiling installers for placing hangers.

PART 2 PRODUCTS

2.1 STEEL DECK

A. Description: Dimensions and properties of steel deck are shown on the Drawings. Deck configuration shall be similar to that indicated. Allowable stress shall equal or exceed that of the deck specified on the Drawings.

B. Deck Type:

1. Deck sizes and types are all indicated on the Drawings. Manufacturers noted are Basis-of-Design products. Pre-bid approval is required for substitutions.

C. Provide shop primer paint at deck scheduled to be painted. Coordinate with Division 9 requirements.

2.2 MATERIALS

A. Steel for Galvanized Metal Deck Units: ASTM A 446, Grade as required to comply with SDI Specifications.

B. Miscellaneous Steel Shapes: ASTM A 36.

C. ASTM A 526, commercial quality, galvanized.

D. Galvanizing: ASTM A 525, G90.

E. Galvanizing Repair Compound: High zinc dust content paint for repairing damage and regalvanizing welds, with dry film containing not less than 94% zinc by weight, and complying with ASTM A 780.

F. Flexible Closure Strips: Manufacturer's standard vulcanized, closed-cell, synthetic rubber.

2.3 FABRICATION

A. General: Form deck units in lengths to span three or more supports, with flush, telescoped or nested 2-inch laps at ends and interlocking or nested side laps, of metal thickness, depth, and width as indicated.

B. Deck Units: Provide deck configurations that comply with SDI "Specifications and Commentary for Steel Roof Deck".

C. Metal Cover Plates: Fabricate metal cover plates for end-abutting floor deck units of not less than same thickness as decking. Form to match contour of deck units and approximately 6 inches wide.

D. Metal Closure Strips: Fabricate metal closure strips, for cell raceways and openings between decking and other construction, of not less than 0.045-inch min. (18 gage) sheet steel. Form to provide tight-fitting closures at open ends of cells or flutes and sides of decking.

PART 3 EXECUTION

3.1 INSTALLATION

A. General: Install deck units and accessories in accordance with manufacturer's recommendations, shop drawings, and as specified herein.
1. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.
2. Align deck units for entire length of run of cells and with close alignment between cells at ends of abutting units.
3. Place deck units flat and square, secured to adjacent framing without warp or deflection.
4. Do not place deck units on concrete supporting structure until concrete has cured and is dry.

B. Attachment:
1. Fasten roof deck units to steel supporting members as indicated on Drawings.
2. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used in correcting welding work. Use welding washers where recommended by deck manufacturer.

C. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking.

D. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking and support of other work shown.

E. Hanger Slots or Clips: Provide UL-approved punched hanger slots between cells or flutes of lower element where floor deck units are to receive hangers for support of ceiling construction, air ducts, diffusers, or lighting fixtures.
1. Hanger clips designed to clip over male side lap joints of floor deck units may be used instead of hanger slots.
2. Locate slots or clips at not more than 14 inches o.c. in both directions, not over 9 inches from walls at ends, and not more than 12 inches from walls at sides, unless otherwise indicated.
3. Provide manufacturer's standard hanger attachment devices.

F. Joint Covers: Provide metal joint covers at abutting ends and changes in direction of floor deck units.

G. Closure Strips: Provide metal closure strips at open uncovered ends and edges of roof decking and in voids between decking and other construction. Weld into position to provide a complete decking installation.
1. Provide flexible closure strips instead of metal closures, at Contractor's option, wherever their use will ensure complete closure. Install with adhesive in accordance with manufacturer's instructions.
2. Provide a minimum of ¼” edge angle at all floor and roof penetrations.

H. Touch-Up Painting: After decking installation, wire brush, clean and paint scarred areas, welds, and rust spots on top and bottom surfaces of decking units and supporting steel members.
1. Touch-up galvanized surfaces with galvanizing repair paint in accordance with ASTM A 780.

3.2 QUALITY CONTROL

A. The independent testing laboratory shall visually inspect all deck attachments to structure and sidelap deck attachment.

END OF SECTION

SECTION 05 4000
COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Formed steel stud exterior wall and interior wall framing.
   1. Load Bearing.
   2. Non-Load Bearing.

1.3 RELATED REQUIREMENTS

A. Section 04 2000 - Unit Masonry.

B. Section 06 1000 - Rough Carpentry: Wood blocking and miscellaneous framing.

C. Section 07 2100 - Thermal Insulation: Insulation within framing members.

D. Section 07 2500 - Weather Barriers: Weather barrier over sheathing.

E. Section 07 6200 - Sheet Metal Flashing and Trim: Head and sill flashings.

F. Section 07 9005 - Joint Sealers.

G. Section 08 1113 - Hollow Metal Doors and Frames.

H. Section 08 4313 - Aluminum-Framed Storefronts.

I. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

J. Section 09 5100 - Acoustical Ceilings: Ceiling suspension system.

1.4 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.

B. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

E. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2011c.

F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2011a.

G. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; American Welding Society; 2008.

H. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.6 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations .

C. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.

D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
   1. Indicate stud layout.
   2. Describe method for securing studs to tracks and for bolted framing connections.
   3. Provide design engineer's stamp on shop drawings.
      a. Structural engineer to be currently licensed in the State of Louisiana.

E. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention .

1.7 QUALITY ASSURANCE

A. Source Limitations: Obtain all types of cold-formed metal framing systems through one source from a single manufacturer.

B. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in LOUISIANA.

C. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.

D. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

E. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code--Sheet Steel."

F. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer’s original packaging with identification labels intact and in sizes to suit project.

B. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

C. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Metal Framing:
   1. Clarkwestern Dietrich Building Systems LLC; Cold-Formed Structural Framing Products: www.clarkdietrich.com.
   2. Marino; Cold-Formed Structural Framing Systems: www.marinoware.com.
   3. Super Stud Building Products, Inc.; Cold-Formed Structural Framing Systems: www.buysuperstud.com.
   4. Substitutions: See Section 01 6300 - Product Substitution Procedures.

B. Framing Connectors and Accessories:
   1. Same manufacturer as metal framing.
   2. Simpson Strong Tie: www.strongtie.com.
      a. As recommended by metal framing manufacturer, meeting design requirements.
   3. As recommended by metal framing manufacturer, meeting design requirements..

2.2 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
   1. Provide cold-formed metal framing for support of aluminum canopy cladding. Provide galvanized steel accessories to accept the aluminum canopy attachment and aluminum/steel isolation materials at connections.
   2. Provide cold-formed metal framing for support of exterior metal wall panels, parapets and penthouse.
   3. Provide cold-formed metal framing for anchoring and support of aluminum-framed storefronts and glazed aluminum curtain walls as required to meet specified performance levels.

B. Design Criteria: Provide completed framing system having the following characteristics:
   1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S100-12.
   2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
   3. Design Loads: As indicated on the structural drawings.
   4. Live load deflection meeting the following, unless otherwise indicated:
      a. Floors: Maximum vertical deflection under live load of L/360 of span.
      b. Roofs: Maximum vertical deflection under live load of L/240 of span.
      c. Exterior Walls: Maximum horizontal deflection under wind load of L/360 of span (unbraced length/height of wall) unless noted otherwise below:
         1) Maximum Allowable Deflection:
            (a) Gypsum Board: L/360 of span under total design loads.
            (b) Plaster or Stucco: L/360 of span under total design loads.
            (c) Brick Veneer: L/600 of span under total design loads.
            (d) Metal Panel Systems: L/280 of span under total design loads.
      d. Design non-axial loadbearing framing to accommodate not less than 1/2 in (13 mm) vertical deflection.
   5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
   7. General Contractor to coordinate stud placement with related sections.

2.3 FRAMING MATERIALS

A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
   1. Gage: 16 gage, 0.065 inch (1.651 mm), minimum, as required to meet specified performance levels.
   2. Web: As indicated on drawings, minimum, as required to meet specified performance levels.

3. Flange: 1-5/8 inch (41.275 mm), minimum, as required to meet specified performance levels.
4. Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating.

B. Framing Connectors: Factory-made, formed steel sheet.
1. Material: ASTM A653/A653M SS Grade 40 (minimum), with G90/Z275 hot dipped galvanized coating for base metal thickness less than 10 gage, 0.1345 inch (3.42 mm), and factory punched holes and slots.
2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
   a. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch (13 mm).
   b. Provide top track with long leg track and head of wall movement connectors; minimum track length of 12 feet (3660 mm).
4. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.
5. Wall Stud Bridging Connections: Provide mechanical load-transferring devices that accommodate wind load torsion and weak axis buckling induced by axial compression loads. Provide bridging connections where indicated on the drawings and as required for the wall system.

2.4 WALL SHEATHING

A. Wall Sheathing: See Section 09 2116.

2.5 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

B. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

C. Water-Resistive Barrier: As specified in Section 07 2500.

2.6 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.

B. Anchorage Devices: Powder actuated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify field measurements and adjust installation as required.

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

3.2 INSTALLATION OF STUDS

A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.

B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches (600 mm) on center. Coordinate installation of sealant with floor and ceiling tracks.

C. Place studs at 16 inches (400 mm) on center; not more than 2 inches (50 mm) from abutting walls and at each side of openings. Connect studs to tracks using clip and tie method.

D. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

E. Install load bearing studs full length in one piece. Splicing of studs is not permitted.

F. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.

G. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

H. Install intermediate studs above and below openings to align with wall stud spacing.

I. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.

J. Attach cross studs to studs for attachment of fixtures anchored to walls.

K. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

L. Touch-up field welds and damaged galvanized surfaces with primer.

3.3 WALL SHEATHING

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.

1. Place water-resistive barrier horizontally over wall sheathing, weather lapping edges and ends.

3.4 TOLERANCES

A. Maximum Variation of any Member from Plane: 1/8" inch (3 mm) in 10 feet (1:960) and as follows:.
   1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

END OF SECTION

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DIVISION 6

WOOD, PLASTICS AND COMPOSITES

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SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Sheathing.

B. Roofing nailers.

C. Roofing cant strips.

D. Preservative treated wood materials.

E. Communications and electrical room mounting boards.

F. Concealed wood blocking, nailers, and supports.

G. Utility Shelving and support system.

1.3 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Setting anchors in concrete.

B. Section 07 2500 - Weather Barriers: Air barrier over sheathing.

C. Section 07 6200 - Sheet Metal Flashing and Trim: Sill flashings.

D. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.4 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

B. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2012.

C. PS 1 - Structural Plywood; 2009.

D. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology, Department of Commerce; 2010.

E. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2014.

1.5 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
   1. 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.
   2. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Southern Pine, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
   4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

B. Lumber fabricated from old growth timber is not permitted.

2.2 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Lumber: S4S, No. 2 or Standard Grade.
2. Boards: Standard or No. 3.

2.3 EXPOSED DIMENSION LUMBER

A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

B. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).

C. Sizes: Nominal sizes as indicated on drawings or as required for installation of unit or system.

D. Surfacing: S4S.

E. Moisture Content: S-dry or MC19.

2.4 CONSTRUCTION PANELS

A. Wall Sheathing: Plywood, PS 1, Grade C-C, Exterior Exposure.
   1. Location: Exterior exposure of temporary wall to enclose existing library while new building addition is erected.
   2. Size: 48 x 96 x 3/4 inch (1219 x 2438 x 19 mm).
   3. Pressure Treated.

B. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch (19 mm) thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

C. Other Applications:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.

2.5 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Stainless steel for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2.6 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft (4.0 kg/cu m) retention.
      a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
      b. Treat plywood in contact with roofing, flashing, or waterproofing.

PART 3 EXECUTION

3.1 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.2 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.3 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

C. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

D. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.

3.4 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.5 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches (610 mm) on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.
   4. Size and Location: As indicated on drawings.

3.6 SITE APPLIED WOOD TREATMENT

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

B. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

C. Allow preservative to dry prior to erecting members.

3.7 TOLERANCES

A. Variation from Plane (Other than Floors): 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

3.8 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 7419.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

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SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Cabinet hardware.

C. Preparation for installing utilities.

1.3 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 12 3600 - Countertops.

1.4 REFERENCE STANDARDS

A. AWI (QCP) - Quality Certification Program, www.awiqcp.org; current edition at www.awiqcp.org.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

C. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).

D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; Hardwood Plywood & Veneer Association; 2009 (ANSI/HPVA HP-1).

E. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

F. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association; 2011.

G. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2010.

1.5 DEFINITIONS

A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.6 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.7 SUBMITTALS

A. See Sectopm 01 3300 - Submittal Procedures.

B. **General: The submittal package shall be submitted as a complete package, including the following listed below. Individual submittals will be returned as incomplete until the complete package is submitted.**

C. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components. Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Indicate the location, alignment and orientation of all "grained", directional laminate veneers on all exposed and semi-exposed surfaces.
   2. Show location and sizes of blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
   3. Show locations and sizes of cut-outs and holes for plumbing fixtures, faucets, soap dispensers, grommets and other items installed in architectural woodwork.
   4. Minimum Scale of Plan Drawings: 1/4 inch to 1 foot (1:48)
   5. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot (1:8).
   6. Provide the information required by AWI/AWMAC/WI (AWS).
   7. Include certification program label.

D. Product Data: Provide data for hardware accessories.

E. Product Data: For panel products, high-pressure decorative laminate, adhesive for bonding plastic laminate, solid-surfacing material, cabinet hardware and accessories and finishing materials and processes.

F. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches (300 mm) square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

G. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

H. Samples:
   1. Plastic-laminates, 8 by 10 inches (200 by 250 mm) for each type, color, pattern, and surface finish with 1 sample applied to core material.
   2. Solid-surfacing materials, 5 inches square.

3. Corner pieces as follows:
   a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches (450 mm) high by 18 inches (450 mm) wide by 6 inches (150 mm) deep.
   b. Miter joints for standing trim.
4. Exposed cabinet hardware, one unit of each type and finish.

I. Product Certificates: For each type of product, signed by product manufacturer.

J. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

K. Qualification Data: For Installer and fabricator.

1.8 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
   2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork.

C. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

D. Quality Certification: Provide AWI Quality Certification Program (QCP) inspection report and quality certification of completed work.
   1. Provide labels or certificates indicating that the work complies with requirements of AWS Grade or Grades specified.
   2. Prior to delivery to the site provide shop drawings with certification labels.
   3. Provide labels on each product when required by certification program.
   4. Upon completion of installation provide certificate certifying that the installation and products meet the specified requirements.
   5. Arrange and pay for inspections required for certification.
   6. Replace, repair, or rework all work for which certification is refused.

E. Installer Qualifications: Certified participant in AWI's Quality Certification Program. Employs skilled installers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

PART 2 PRODUCTS

2.1 CABINETS

A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI (AWS) for Custom Grade.

B. All wood panel products shall be "No Added Urea Formaldehyde" (NAUF); no exceptions.

C. Cabinets:
   1. Finish - Exposed Exterior Surfaces: Decorative laminate.
   2. Finish - Exposed Interior Surfaces: Melamine.
   3. Finish - Concealed Surfaces: Manufacturer's option.
   4. Door and Drawer Front Edge Profiles: Square edge with thin applied band.
      a. Thickness: 3 mm.
   5. Door and Drawer Front Retention Profiles: Fixed panel.
   6. Casework Construction Type: Type A - Frameless.
   7. Interface Style for Cabinet and Door: Style 1 - Overlay; flush overlay.
   8. Adjustable Shelf Loading: 50 lbs. per sq. ft..
      a. Deflection: L/144.
   9. Cabinet Style: Flush overlay.
      a. Reveal Dimension: As indicated on Drawings.
   10. Cabinet Doors and Drawer Fronts: Flush style.
   11. Drawer Side Construction: Multiple-dovetailed.
   12. Drawer Construction Technique: Dovetail joints.

2.2 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. All substrate material is to be to AWI Standard for Custom Grade, laminate cabinets. **Particle Board** is not to be used on this project, without exception. Substrate materials to be as follows:
   1. Interior Type, hardwood veneer core, Grade B-B plywood.
   2. Medium Density Overlay, DOC PS 1.
      a. Plywood - Any softwood species complying with PS-1/ANSI A 199.1 standards; APA Interior Type, veneer core, B-B grade; 3/4-inch thick unless otherwise indicated.
   3. Solid hardwood lumber.
      a. Hardboard: AHA A135.4.

2.3 LAMINATE MATERIALS

A. Manufacturers:
   1. Panolam Industries International, Inc\Nevamar: www.nevamar.com.
   2. Lamin-Art, Inc.: www.laminart.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

a. Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.
b. Color/finish by alternate or Architect approved manufacturer will be selected by Architect from manufacturer's full range.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as follows:
1. Horizontal Surfaces: HGS, 0.048 inch (1.22 mm) nominal thickness, through color, colors as scheduled, finish as scheduled.
2. Vertical Surfaces: VGS, 0.028 inch (0.71 mm) nominal thickness, through color, colors as scheduled, finish as scheduled.
3. Cabinet Liner: CLS, 0.020 inch (0.51 mm) nominal thickness, through color, color as selected by Architect, finish as scheduled.
4. Laminate Backer: BKL, 0.020 inch (0.51 mm) nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.
5. Colors and Patterns:
a. **BASIS OF DESIGN MANUFACTURER AND COLORS/FINISH**- Use as a group. No substitutions.
1) Plastic Laminate (**PL-1**):
(a) Manufacturer: Nevamar.
(1) Color: As indicated on drawings.
(2) Finish: As indicated on drawings.
2) Plastic Laminate (**PL-2**):
(a) Manufacturer: Lamin-Art.
(1) Color: As indicated on drawings.
(2) Finish: As indicated on drawings.
b. Alternate to Basis of Design Manufacturer and color/finish: As selected by Architect from manufacturer's full range.

2.4 SPECIAL FINISHES

A. Type WP-1: Decorative Wood Panel.
1. **BASIS OF DESIGN**: Smith and Fong Company; Plyboo Linear Line Panel: www.plyboo.com.
2. Alternative Manufacturers:
a. Prior approved equal.
3. Substitutions: See Section 01 6000 - Product Requirements.
a. Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.

b. Color/finish by alternate or Architect approved manufacturer will be selected by Architect from manufacturer's full range.

4. Wall Panels: Type AWP-1:
   a. Material: 100% Bamboo (FSC Certified).
   b. Surface Texture: Prefinished.
   c. Surface Type: Vertical Linear-ridged.
   d. Base/Core Composition: REALCORE™; Species: Moso bamboo (Phyllostachys Pubescens).
   e. Patterns: As indicated on the drawings.
   f. Standards/Certifications: CARB II.
   g. Thickness: ¾-inch (19mm).
   h. Width: 47-1/2 inches (1206mm).
   i. Panel Heights: 95-1/2 inches (2426mm).
   j. Edge Profile: Straight edge.
   k. Flame Spread: ASTM E84; Class C.
   l. Emission Testing: Section 01350 Protocol: No VOC's with chronic REL's (reference exposure level) detected, passes office, school and residential.
   m. Dimensional Stability: Standard - space must be enclosed with HVAC systems operating and with appropriate humidity levels maintained between 30%RH-50%RH at all times.

2.5 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.
   1. General: Do not use adhesives that contain urea formaldehyde.
   2. Adhesive for Bonding Plastic Laminate: Un-pigmented contact cement.
   3. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

B. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, fire-retardant-treated, kiln-dried to less than 15 percent moisture content.

C. Fasteners: Size and type to suit application.

D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel finish in exposed locations.

E. Concealed Joint Fasteners: Threaded steel.

F. Grommets: Standard plastic grommets for cut-outs, in color as selected by Architect.
   1. Size: 3 inch (76 mm), round.

G. Low Profile Counter Support Brackets:
   1. Gambus Company; Workstation Bracket: www.gambasbrackets.com.
      a. Refer to drawings for size and finish.

2.6 HARDWARE

A. Hardware: BHMA A156.9, types as indicated for quality grade specified.

B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.

C. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, 4 inch centers ("U" shaped wire pull, steel with chrome finish, 100 mm centers).

D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with chrome finish.

E. Catches: Magnetic.

F. Drawer Slides:
   1. Type: Extension types as scheduled.
   2. Static Load Capacity: Commercial grade.
   3. Mounting: Side mounted.
   4. Stops: Integral type.
   5. Features: Provide self closing/stay closed type.

G. Hinges: European style concealed self-closing type, BHMA No. A156.9, B01602, steel with polished finish.

2.7 SHOP TREATMENT OF WOOD MATERIALS

A. Provide UL approved identification on fire retardant treated material.

B. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

2.8 FABRICATION

A. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated, as required, for the following:
   1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch (19 mm) Thick or Less: 1/16 inch (1.5 mm).
   2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).

B. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

C. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. For woodwork fabrication taking place within a 60-mile radius of the site, notify the Architect seven days in advance of the dates and times woodwork fabrication will be complete.
2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.

D. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

E. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

F. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.
   1. Cap exposed plastic laminate finish edges with material of same finish and pattern.

G. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches (400 mm) on center.

H. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Seal cut edges.
   1. Shop-cut openings to maximum extent practical to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
   2. Seal edges of openings in wood substrate countertops with a coat of varnish.

2.9 SHOP FINISHING

A. General: Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

B. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
   1. Back-priming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require back-priming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.

PART 3 EXECUTION

3.1 EXAMINATION

A. Before installation, acclimate woodwork to average prevailing humidity conditions in installation areas.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and back-priming.

C. Verify adequacy of backing and support framing.

D. Verify location and sizes of utility rough-in associated with work of this section.

3.2 INSTALLATION

A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

B. Use fixture attachments in concealed locations for wall mounted components.

C. Use concealed joint fasteners to align and secure adjoining cabinet units.

D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (1 mm). Do not use additional overlay trim for this purpose.

E. Secure cabinets to floor using appropriate angles and anchorages.

F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

G. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
   1. Use treated wood blocking and nailers when attaching directly to concrete floor slab.

H. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
   1. Install cabinets with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
   2. Maintain veneer sequence matching of cabinets with transparent finish.
   3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with toggle bolts through metal backing or metal framing behind wall finish.

I. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
   1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
   2. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.
   3. Secure backsplashes [to tops with concealed metal brackets at 16 inches (400 mm) o.c.] [and] [to walls with adhesive].
   4. Caulk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

J. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

3.3 ADJUSTING

A. Test installed work for rigidity and ability to support loads.

B. Adjust moving or operating parts to function smoothly and correctly.

3.4 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

DIVISION 7

THERMAL AND MOISTURE PROTECTION

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SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Batt insulation in exterior wall and ceiling construction.

B. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.3 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Framing: Board insulation as wall sheathing.

B. Section 07 2500 - Weather Barriers: Separate air barrier and vapor retarder materials.

C. Section 07 4113 - Metal Roof Panels.

D. Section 07 8400 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.

E. Section 09 2116 - Gypsum Board Assemblies: Acoustic insulation inside walls and partitions.

1.4 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.

B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

D. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

E. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.

1.5 SUBMITTALS

A. See Section 01-3300 - Submittal Procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.6 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.1 APPLICATIONS

A. Insulation in Metal Framed Walls: Batt insulation with no vapor retarder.

B. Insulation Above Lay-In Acoustical Ceilings: Batt insulation with no vapor retarder.

2.2 BATT INSULATION MATERIALS

A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor's option.

B. Locate insulation in the following areas and as indicated on drawings:
   1. Within all new exterior wall stud cavities.
   2. Above all new ceiling systems.
   3. Above all existing ceiling systems throughout the entire existing building.

C. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. This insulation material is not to be used at walls or partitions indicated to receive sound attenuation. See Section 09 2116 - Gypsum Board Assembles for material and system requirements.
   2. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   3. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
   4. Combustibility: Non-combustible, when tested in accordance with ASTM E136/Unfaced Insulation: Pass.
   5. Formaldehyde Content: Zero.
   6. **Exterior Wall Insulation**:
      a. Thermal Resistance: R of 21 (RSI of 3.7), minimum.
      b. Thickness: 5 1/2 inch (140 mm).
      c. Facing: Unfaced.

7. **Insulation Above Ceiling**:
   a. Thermal Resistance: R of 38 (RSI of 3.7), minimum.
   b. Thickness: 11.25 inch (286 mm).
8. Manufacturers:
   a. CertainTeed Corporation; Sustainable/Fiber Glass Insulation: www.certainteed.com.
   b. Johns Manville; Formaldehyde-Free Fiber Glass Insulation: www.jm.com.
   c. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: www.ocbuildingspec.com.
9. Substitutions: See Section 01 6000 - Product Requirements.

2.3 ACCESSORIES

A. Tape: Bright aluminum self-adhering type,mesh reinforced, 2 inch (50 mm) wide as recommended by manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation .

3.2 BATT INSTALLATION

A. Install insulation in accordance with manufacturer's instructions.

B. Install in exterior wall and ceiling spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

E. Retain insulation batts in place as recommended by manufacturer.

F. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

G. Coordinate work of this section with construction of air barrier seal specified in Section 07 2500.

3.3 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

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SECTION 07 2423
DIRECT-APPLIED FINISH SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Materials and installation of exterior direct-applied cement board stucco backed with drainage mat and fluid applied air/moisture barrier, for frame walls.

1.3 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-In-Place Concrete.

B. Section 04 2000 - Unit Masonry: Wall substrate construction.

C. Section 07 2500 - Weather Barriers: Weather Barrier over sheathing.

D. 07 4113 - Metal Roof Panels.

F. Section 07 6200 - Sheet Metal Flashing and Trim: Perimeter flashings.

G. Section 07 9005 - Joint Sealers: Sealing joints between EIFS and adjacent construction and penetrations through EIFS.

H. Section 08 4313 - Aluminum-Framed Storefronts.

I. Section 09 2116 - Gypsum Board Assemblies: Sheathing.

1.4 REFERENCE STANDARDS

A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2011.

B. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

C. ASTM C297/C297M - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions; 2004 (Reapproved 2010).

D. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units; 2014.

E. ASTM C1397 - Standard Practice for Application of Class PB Exterior Insulation and Finish Systems (EIFS) and EIFS with Drainage; 2013.

F. ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive; 2005 (Reapproved 2010).

G. ASTM D2247 - Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity; 2011.

H. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

J. ASTM E283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 04(2012).

K. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

L. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

M. ASTM E2273 - Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies; 2003 (Reapproved 2011).

N. ASTM E2485/E2485M - Standard Test Method for Freeze/Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water Resistive Barrier Coatings; 2013.

O. ASTM E2486/E2486M - Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS); 2013.

P. ASTM G153 - Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013.

Q. ASTM G155 - Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013.

R. ICC-ES AC219 - Acceptance Criteria for Exterior Insulation and Finish Systems; 2009.

S. ICC-ES AC235 - Acceptance Criteria for EIFS Clad Drainage Wall Assemblies; 2004 (Editorially revised 2009).

T. NFPA 268 - Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source; 2012.

U. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components; 2012.

1.5 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate wall joint patterns, joint details, and molding profiles.

C. Product Data: Provide data on system materials, product characteristics, performance criteria, and system limitations.

D. Selection Samples: Submit manufacturer's standard range of samples illustrating available coating colors and textures.

E. Verification Samples: Submit actual samples of selected coating on specified substrate, minimum 12 inches (300 mm) square, illustrating project colors and textures.

F. Manufacturer's Installation Instructions: Indicate preparation required, installation techniques, and jointing requirements.

1.6 QUALITY ASSURANCE

A. All systems and associated materials are to be sole-sourced from a single manufacturer or recommended by system manufacturer for use on this project.

B. Maintain copy of specified installation standard and manufacturer's installation instructions at project site at all times during installation.

C. EIFS Manufacturer Qualifications: Provide all EIFS products other than insulation from the same manufacturer with qualifications as follows:
   1. Member in good standing of EIMA (EIFS Industry Members Association).
   2. Manufacturer of EIFS products for not less than 20 years.
   3. Air/moisture barrier for a minimum of ten (10) years.
   4. Manufacturing facilities ISO 9001 certified.

D. Insulation Manufacturer Qualifications: Approved by manufacturer of EIFS and approved and labeled under third party quality program as required by applicable building code.

E. Installer Qualifications: Company specializing in EIFS work, with minimum three years of documented experience, and approved by manufacturer.
   1. Knowledgeable in the proper use and handling of system materials.
   2. Employ skilled mechanics who are experienced and knowledgeable in air/moisture barrier and EIFS application, and familiar with the requirements of the specified work.
   3. Successful completion of minimum of three (3) projects of similar size and complexity to the specified project.
   4. Provide the proper equipment, manpower and supervision on the job site to install the system in compliance with manufacturer's published specifications and details and the project plans and specifications.

1.7 MOCK-UP

A. Construct mock-up of typical EIFS application on specified substrate, size as required to include examples of all key conditions, and including flashings, joints, and edge conditions.
   1. Construct full-scale mock-up of typical air/moisture barrier and EIFS/window wall assembly with specified tools and materials and test air and water infiltration and structural performance in accordance with ASTM E 283, ASTM E 331 and ASTM E 330, respectively, through independent laboratory. Mock-up shall comply with requirements of project specifications. Approved mock-up to be reference standard for the duration of installation.

B. Locate mock-up where directed by Architect.

C. Mock-up may remain as part of the Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to project site in manufacturer's original, unopened containers with labels intact. Inspect materials and notify manufacturer of any discrepancies.

B. Storage: Store materials as directed by manufacturer's written instructions.
   1. Protect adhesives and finish materials from freezing, temperatures below 40 degrees F (4 degrees C) and temperatures in excess of 90 degrees F (32 degrees C).
   2. Protect Portland cement based materials from moisture and humidity. Store under cover off the ground in a dry location.
   3. Protect insulation materials from exposure to sunlight.

1.9 FIELD CONDITIONS

A. Do not prepare materials or apply EIFS under conditions other than those described in the manufacturer's written instructions.

B. Do not prepare materials or apply EIFS during inclement weather unless areas of installation are protected. Protect installed EIFS areas from inclement weather until dry.

C. Do not install coatings or sealants when ambient temperature is below 40 degrees F (5 degrees C).

D. Do not leave installed insulation board exposed to sunlight for extended periods of time.

E. Provide protection of surrounding areas and adjacent surfaces from application of products.

1.10 COORDINATION/SCHEDULING

A. Provide site grading such that the EIFS terminates above grade a minimum of 6 inches (150 mm) or as required by code

B. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuously connected air and moisture barrier

C. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall

D. Install window and door head flashing immediately after windows and doors are installed

E. Install diverter flashings wherever water can enter the wall assembly to direct water to the exterior

F. Install splices or tie-ins from air/moisture barrier over back leg of flashings, starter tracks, and similar details to form a shingle lap that directs incidental water to the exterior

G. Install copings and sealant immediately after installation of the the EIFS when coatings are dry, and such that, where sealant is applied against the EIFS surface, it is applied against the base coat or primed base coat surface

H. Schedule work such that air/moisture barrier is exposed to weather no longer than 30 days

I. Attach penetrations through the EIFS to structural support and provide water tight seal at penetrations

1.11 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's standard material warranty, covering a period of not less than 10 years.

C. Provide separate warranty from installer covering labor for repairs or replacement for a period of not less than 5 years.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide manufacturer's all-inclusive system, complete with all components required to meet the specified requirements of this specification and industry standards.

2.2 MANUFACTURERS

A. **Basis of Design**: Sto Corp.; Sto Quik Silver NExT/Cement Board Stucco: www.stocorp.com.

B. Other Acceptable Manufacturers:
   1. Dryvit Systems, Inc; Dryvit Cement Board MD Finish System, with Moisture Drainage: www.dryvit.com.
   2. BASF Wall Systems (Senergy, Finestone, Acrocrete, SonoWall); Senergy; Cement Board Stucco System 1000: www.wallsystems.basf.com.
   3. Prior approved equal.
   4. Substitutions: See Section 01 6000 - Product Requirements.
   5. Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.

2.3 EXTERIOR INSULATION AND FINISH SYSTEM

A. Exterior Insulation and Finish System: DRAINAGE type; reinforced finish coating on mechanically-fastened exterior cement board over sheet-type drainage layer or spacers and separate sheet-type water-resistive barrier over substrate; provide a complete system that has been tested to show compliance with the following characteristics; include all components of specified system and substrate(s) in tested samples.

B. Allowable Wind Loading: At least +166, -94 psf (+7.94, -4.50 kPa), positive and negative, determined in accordance with ICC-ES AC219 or AC235, using factor of safety of 3.0.
   1. Design for maximum allowable system deflection, normal to the plane of the wall, of L/360.
   2. Design for wind load in conformance with code requirements.

C. Fire Characteristics:
   1. Flammability: Pass, when tested in accordance with NFPA 285.
   2. Ignitibility: No sustained flaming when tested in accordance with NFPA 268.

D. Adhesion of Water-Resistive Coating to Substrate: For each combination of coating and substrate, minimum flatwise tensile bond strength of 15 psi (105 kPa), when tested in accordance with ASTM C297/C297M.

E. Water Penetration Resistance: No water penetration beyond the plane of the base coat/insulation board interface after 15 minutes, when tested in accordance with ASTM E331 at 6.24 psf (299 Pa) differential pressure with tracer dye in the water spray; include in tested sample at least two vertical joints and one horizontal joint of same type to be used in construction; disassemble sample if necessary to determine extent of water penetration.

1. Prevent the accumulation of water behind the EIFS or into the wall assembly, either by condensation or leakage through the wall construction, in the design and detailing of the wall assembly:
   a. Provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, at floor lines, and at the base of the wall.
   b. Air Leakage Prevention - provide continuity of the air barrier system at foundation, roof, windows, doors, and other penetrations through the wall with connecting and compatible air barrier components to minimize condensation and leakage caused by air movement.
   c. Vapor Diffusion and Condensation - perform a dew point analysis and/or dynamic hygrothermal modeling of the wall assembly to determine the potential for accumulation of moisture in the wall assembly by diffusion. Adjust insulation thickness and/or other wall assembly components accordingly to minimize risk. Do not use vapor retarders on the interior side of the wall in warm, humid climates.

F. Drainage Efficiency: Average minimum efficiency of 90 percent, when tested in accordance with ASTM E2273 for 75 minutes.

G. Salt Spray Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 300 hours exposure in accordance with ASTM B117, using at least three samples matching intended assembly, at least 4 by 6 inches (100 by 150 mm) in size.

H. Freeze-Thaw Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 10 cycles, when tested in accordance with ASTM E2485/E2485M.

I. Weathering Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 2000 hours of accelerated weathering conducted in accordance with ASTM G153 Cycle 1 or ASTM G155 Cycle 1, 5, or 9.

J. Water Degradation Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 14 days exposure, when tested in accordance with ASTM D2247.

K. Mildew Resistance: No growth supported on finish coating during 28 day exposure period, when tested in accordance with ASTM D3273.

L. Abrasion Resistance Of Finish: No cracking, checking or loss of film integrity when tested in accordance with ASTM D968 with 500 liters of sand.

M. Impact Resistance: Construct system to provide the following impact resistance without exposure of broken reinforcing mesh, when tested in accordance with ASTM E2486/E2486M:
   1. Standard: 25 to 49 in-lb (2.83 to 5.54 J), for areas inaccessible to public.

2. Medium: 50 to 89 in-lb (5.65 to 10.1 J), for areas with limited access to public.
3. High: 90 to 150 in-lb (10.2 to 17 J), for areas with general access to public.
4. Ultra-High: Over 150 in-lb (17.1 J), for areas subject to potential abuse.

N. Joints
1. Provide minimum 3/4 inch (19 mm) wide joints in the EIFS where they exist in the substrate or supporting construction, where the cladding adjoins dissimilar construction or materials, at changes in building height, at expansion, control, and cold joints in construction, and at floor lines in multi-level wood frame construction. Size joints to correspond with anticipated movement. Align terminating edges of EIFS with joint edges of through wall expansion joints and similar joints in construction. Refer to manufacturer details.
2. Provide minimum 1/2 inch (13 mm) wide perimeter sealant joints at all penetrations through the EIFS (windows, doors, mechanical, electrical, and plumbing penetrations, etc.).
3. Provide manufacturer's recommended compatible backer rod and sealant that has been evaluated in accordance with ASTM C 1382, and that meets minimum 50% elongation after conditioning.
4. Provide joints so that air barrier continuity is maintained across the joint, and drain joints to the exterior, or provide other means to prevent or control water infiltration at joints.

O. Grade Condition
1. EIFS is not to be installed below grade or on surfaces subject to continuous or intermittent water immersion or hydrostatic pressure.
2. Provide minimum 6 inch (152 mm) clearance above grade or as required by code.

2.4 MATERIALS

A. Finish Coating Top Coat: Water-based, air curing, acrylic finish with integral color and texture.
1. Texture: Medium.
2. Color: As selected by Architect from manufacturer's full range.

B. Primer: Water-based, vapor permeable, acrylic coating. Tinted to the same color as finish. Low VOC content. To promote uniform substrate absorption.

C. Base Coat: Acrylic- or polymer-modified, fiber reinforced Portland cement coating.
1. Portland Cement: ASTM C150, Type I or II.
2. Base Coat Thickness: 1/4 inch (6 mm), minimum.

D. Reinforcing Mesh: Balanced, open weave glass fiber fabric, treated for compatibility and improved bond with coating, weight, strength, and number of layers as required to meet required system impact rating.

E. Drainage Layer or Spacers: Furnished or approved by EIFS manufacturer; capable of achieving specified drainage rate; not required to be water-resistive, air retarder, or vapor retarder.

F. Cementitious Sheathing Board: Exterior type, fiber-mat reinforced, complying with ASTM C1325.
   1. Size: 1/2 inch (12.mm) thick, 32 by 96 inches (813.0 by 2438.4 mm) panels.

G. Water-Resistive Barrier Coating: Fluid-applied air and water barrier membrane; applied to sheathing; furnished or approved by EIFS manufacturer.

H. Fluid-Applied Flashing: Flexible water based polymer material suitable for use with reinforcing mesh and, if used with water-resistive barrier sheet, certified compatible with sheet material.

I. Flashing Tape: Self-adhering rubberized asphalt tape with polyethylene backing or other material and surface conditioner furnished or approved by EIFS manufacturer.

2.5 ACCESSORY MATERIALS

A. Metal Flashings: As specified in Section 07 6200.

B. Trim: EIFS manufacturer's standard PVC or galvanized steel trim accessories, as required for a complete project and including starter track and drainage accessories.

C. Sealant Materials: Compatible with EIFS materials and as recommended by EIFS manufacturer.

PART 3 EXECUTION

3.1 GENERAL

A. Install in accordance with EIFS manufacturer's instructions and ASTM C1397.

B. Where different requirements appear in either document, comply with the most stringent.

C. Neither of these documents supercedes the provisions of the Contract Documents that define the contractual relationships between the parties or the scope of work.

3.2 EXAMINATION

A. Verify that substrate is sound and free of oil, dirt, other surface contaminants, efflorescence, loose materials, or protrusions that could interfere with EIFS installation and is of a type and construction that is acceptable to EIFS manufacturer. Do not begin work until substrate and adjacent materials are complete and thoroughly dry.

B. Verify that substrate surface is flat, with no deviation greater than 1/4 in (6 mm) when tested with a 10 ft (3 m) straightedge.

3.3 INSTALLATION - WATER-RESISTIVE BARRIER

A. Apply barrier coating as recommended by coating manufacturer; prime substrate as required before application.

B. Seal all substrate transitions and intersections with other materials to form continuous water-resistive barrier on exterior of sheathing, using method recommended by manufacturer.

C. At door and window rough openings and other wall penetrations, seal water-resistive barrier and flexible flashings to rough opening before installation of metal flashings, sills, or frames, using method recommended by manufacturer.

D. At moving expansion joints, apply flexible flashing or flashing tape across and recessed into joint with U-loop forming continuous barrier but allowing movement.

E. Lap flexible flashing or flashing tape at least 2 inches (50 mm) on each side of joint or transition.

F. Install drainage layer or spacers after flashing tape has been completed.

3.4 INSTALLATION - FINISH

A. Base Coat: Apply in thickness as necessary to fully embed reinforcing mesh, wrinkle free, including back-wrap at all terminations of the EIFS. Install reinforcing fabric as recommended by EIFS manufacturer.
   1. Lap reinforcing mesh edges and ends a minimum of 2-1/2 inches (64 mm).
   2. Allow base coat to dry a minimum of 24 hours before next coating application.

B. At areas subject to abuse, install second layer of reinforcing mesh embedded in second coat of base coating, tightly butting ends and edges of mesh.

C. Install expansion joints at floor lines as recommended by EIFS manufacturer.

D. Primer Coat: Apply in thickness as recommended by manufacturer.
   1. Allow primer coat to dry a minimum of 24 hours before next coating application.

E. Apply finish coat after primer coat has dried not less than 24 hours and finish to a uniform texture and color.

F. Finish Coat Thickness: As recommended by manufacturer.

G. Seal control and expansion joints within the field of exterior finish and insulation system, using procedures recommended by sealant and finish system manufacturers.

3.5 CLEANING

A. Clean EIFS surfaces and work areas of foreign materials resulting from EIFS operations.

3.6 PROTECTION

A. Protect completed work from damage and soiling by subsequent work.

END OF SECTION

SECTION 07 2500
WEATHER BARRIERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Water-Resistive Barrier: Under exterior wall cladding, over sheathing or other substrate; not air tight or vapor retardant.

B. Air Barriers: Materials that form a system to stop passage of air through exterior walls and joints around frames of openings in exterior walls.

1.3 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.

B. Section 05 4000 - Cold-Formed Metal Framing: Water-resistive barrier under exterior cladding.

C. Section 06 1000 - Rough Carpentry: Water-resistive barrier under exterior cladding.

D. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.

E. Section 07 9005 - Joint Sealers.

F. Section 09 2116 - Gypsum Board Assemblies: Water-resistive barrier under exterior cladding.

1.4 DEFINITIONS

A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.

B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.

C. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.

1. Water Vapor Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) = 1 perm.

D. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture resistant, to the degree specified, intended to be installed to shed water without sealed seams.

1.5 REFERENCE STANDARDS

A. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.

B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2006a (Reapproved 2013).

C. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

E. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

F. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies containing Combustible Components.

1.6 PERFORMANCE REQUIREMENTS

A. General: Air barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

B. Membrane Air Permeance: Not to exceed 0.0004 cfm/sq. ft. of surface area (at specified thickness) at 1.57 lbf/sq. ft. pressure difference (0.002 L/s x sq. m of surface area at 75 Pa) when applied to CMU wall; when tested per ASTM E 2178.

C. Membrane Vapor Permeance: Not more than 12 perms; when tested per ASTM E 96, Method B.

D. UV Exposure Limit: Not more than 180 calendar days: per ASTM D 412 and ASTM E 96 Method B.

1.7 AIR BARRIERS

A. The building envelope shall be designed and constructed with a continuous air barrier to control air leakage into, or out of the conditioned space. An air barrier shall also be provided for interior partitions between conditioned space and space designed to maintain temperature or humidity levels which differ from those in the conditioned space by more than 50% of the difference between the conditioned space and design ambient conditions. The air barrier shall have the following characteristics:
   1. It must be continuous, with all joints made airtight.
   2. It shall have an air permeability not to exceed 0.004 cfm/sq. ft. under a pressure differential of 0.3 in. water. (1.57 psf.)(equal to 0.02L/sq. m @ 75 Pa.).
   3. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.
   4. It shall be durable or maintainable.
   5. The air barrier shall be joined in an airtight and flexible manner to the air barrier material of adjacent systems, allowing for the relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between:
      a. Foundation and walls.
      b. Walls and windows or doors.
      c. Different wall systems.
      d. Wall and roof.
      e. Wall and roof over unconditioned space.
      f. Walls, floor and roof across construction, control and expansion joints.
      g. Walls, floors and roof to utility, pipe and duct penetrations.
   6. All penetrations of the air barrier and paths of air infiltration/exfiltration shall be made airtight.

1.8 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Provide data on material characteristics.
   1. Provide data complying with thickness requirements.

C. Shop Drawings: Show locations and extent of air barrier. Include details for substrate joints and cracks, counter-flashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
   1. Include details of interfaces with other materials that form part of air barrier.
   2. Include details of mockups.

D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.
   1. Provide data complying with thickness requirements.

E. Product Certificates: For air barriers, certifying compatibility of air barrier and accessory materials with Project materials that connect to or that come in contact with the barrier; signed by product manufacturer.

F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for air barriers.
   1. Provide independent agency testing reports for ASTM E 2357.

1.9 QUALITY ASSURANCE

A. Applicator Qualifications: A firm experienced in applying air barrier materials similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

B. Pre-installation Conference: Conduct conference at Project site.
   1. Include installers of other construction connecting to air barrier, including waterproofing, architectural precast concrete, masonry, sealants, windows, glazed curtain walls, and door frames.
   2. Review air barrier requirements including surface preparation, substrate condition and pretreatment, minimum substrate curing period, forecasted weather conditions, special details and sheet flashings, mockups, installation procedures, sequence of installation, testing and inspecting procedures, and protection and repairs.

C. **Source Limitations: Obtain primary air barrier material, wall flashing materials, sealants, primers and other miscellaneous materials as recommended by the manufacturer to provide a complete and warranted system through one source from a single manufacturer.**

1.10 MOCK-UP

A. Install air barrier materials in mock-up specified in 07 4213 - Metal Wall Panels, Section 08 4313 - Aluminum-Framed Storefronts, and Section 08 4413 - Glazed Aluminum Curtain Walls.

B. Mockups: Before beginning installation of air barrier, provide air barrier work for exterior wall assembly mockups, incorporating backup wall construction, external cladding, window, door frame and sill, insulation, and flashing to demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of air barrier membrane.

C. Coordinate construction of mock-up to permit inspection by Owner’s testing agency of air barrier before external insulation and cladding is installed.

D. If Architect determines mock-ups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier manufacturer.
   1. Remove and replace liquid materials that cannot be applied within their stated shelf life.

B. Store rolls according to manufacturer's written instructions.

1.12 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.
   1. Protect substrates from environmental conditions that affect performance of air barrier. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

1.13 WARRANTY

A. Manufacturer’s Warranty: Manufacturer's standard form in which manufacturer will replace or repair fluid applied membrane systems that do not comply with requirements within specified warranty period.
   1. Warranty Period: Ten years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 WEATHER BARRIER ASSEMBLIES

A. Water-Resistive Barrier: Provide on exterior of Temporary Wall to enclose existing library while new building addition is being erected..
   1. Use 30 pound asphalt felt unless otherwise indicated.

B. Air Barrier:
   1. On outside surface of sheathing of exterior walls use air barrier coating.

2.2 WATER-RESISTIVE BARRIER MATERIALS (NEITHER AIR BARRIER NOR VAPOR RETARDER)

A. Asphalt Felt: ASTM D226 Type I felt (No.30).

2.3 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

A. Air Barrier, Fluid Applied: Vapor permeable, elastomeric waterproofing.

B. Air Barrier Coating:
   1. Material: Acrylic.
   2. Adhesion to Paper and Glass Mat Faced Sheathing: Sufficient to ensure failure due to delamination of sheathing.
   3. Dry Film Thickness: To be the minimum thickness required by the manufacturer's specified system, but the system shall be at least 30 mils (0.035 inch) (0.89 mm), minimum.

4. Air Permeance: 0.004 cubic feet per minute per square foot (0.02 L/s/sq m), maximum, when tested in accordance with ASTM E2178.
5. Water Vapor Permeance: 5 perms (287 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M, Procedure B.
6. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 6 months weather exposure.
7. Elongation: 250 percent, minimum, when tested in accordance with ASTM D412.
8. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
9. Nail Sealability: Pass, when tested in accordance with ASTM D1970/D1970M.
10. VOC Content: 100 g per L or less.
11. Sealants, Tapes and Accessories: As recommended by coating manufacturer.
12. System to comply with NFPA 285 wall assemblies.
13. Products:
    a. Grace Construction Products; Perm-A-Barrier VPL: www.graceconstruction.com. **BASIS OF DESIGN.**
    b. Tremco, Inc.: ExoAir 230; www.tremcosealants.com.
    c. W.R. Meadows, Inc.; Air-Shield LMP: www.wrmeadows.com..

2.4 SEALANTS

A. One-part neutral curing, ultra low modulus silicone sealant that reacts with atmosphere moisture to form a durable and flexible building sealant.
   1. No primer.
   2. No staining or residue rundown.
   3. High movement capability.
   4. Strong adhesion.
   5. Compatibility with adjacent materials.
   6. Material Characteristics:
      a. VOC Content: 100 g/L or less.
      b. Cured Properties after 7 days cure at 77 degrees (25 degrees C), 50 percent R.H.
         1) Hardness (Shore A) per ASTM C 661: 20.
         2) Elongation per ASTM D 412: 1000 percent.
         3) Modulus at 1000 percent Elongation per ASTM D 412: 30 psi.
         4) Ultimate Tensile Strength per ASTM D 412: 120 psi.
         5) Tear Strength per ASTM D 624: 30 pli.
   7. Products:
      a. W. R. Grace Construction Products; S100 Sealant: www.graceconstruction.com. **BASIS OF DESIGN.**
      b. Tremco Commercial Sealants and Waterproofing;Spectrem 1 Ultra Low-Modulus Silicone Joint Sealant: www.tremcosealants.com.
      c. W.R. Meadows, Inc.: www.wrmeadows.com.
         1) Dow Corning Corporation; 758 Silicone Weather Barrier Sealant: www.dowcorning.com.
   8. Color to be selected by Architect from manufacturer's full range.
   9. Substitutions: See Section 01 6300 - Product Substitution Procedures.

B. Primers, Cleaners, and Other Sealant Materials: As recommended by weather barrier manufacturer, appropriate to application, and compatible with adjacent materials.
   1. Color to be selected by Architect from manufacturer's full range.

2.5 ACCESSORIES

A. Sealants, Tapes, and Accessories for Sealing Weather Barrier and Sealing Weather Barrier to Adjacent Substrates: As specified or as recommended by weather barrier manufacturer.

B. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement is waived if not installed on a roof.
   1. Composition: Butyl rubber sheet laminated to elasticized polyethylene sheet.
   2. Thickness: 40 mil (0.040 inch) (1.02 mm), nominal.
   3. Products:
      a. Grace Construction Products: www.na.graceconstruction.com. **BASIS OF DESIGN.**
         1) Transition/Detail Membrane: Perm-A-Barrier Detail Membrane.
         2) Transition Aluminum Membrane: Perm-A-Barrier Aluminum Flashing.
         3) Flexible Membrane Wall Flashing: Perm-A-Barrier Wall Flashing.
      b. Tremco Commercial Sealants and Waterproofing: www.tremcosealants.com.
         1) Transition/Detail Membrane: ExoAir 110 Self-Adhered Air and Vapor Membrane.
         2) Flexible Membrane Wall Flashing: ExoAir TWF (Thru-Wall Flashing)
      c. W.R. Meadows, Inc.: www.wrmeadows.com.
         1) Transition/Detail Membrane: Air-Shield Thru-Wall Flashing.
         2) Flexible Membrane Wall Flashing: Air-Shield Thru-Wall Flashing.
      d. As recommended by weather barrier manufacturer, appropriate to application, and compatible with adjacent materials.

C. Thinners and Cleaners: As recommended by material manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the work of this section.

3.2 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

B. Clean and prime substrate surfaces to receive primer and membrane in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Water-Resistive Barriers: Install continuous barrier over surfaces indicated, with sheets lapped to shed water but with seams not sealed.

C. Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.

D. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

E. Mechanically Fastened Sheets - On Exterior:
   1. Install sheets shingle-fashion to shed water, with seams generally horizontal.
   2. Overlap seams as recommended by manufacturer but at least 6 inches.
   3. Overlap at outside and inside corners as recommended by manufacturer but at least 12 inches (305 mm).
   4. Attach to framed construction with fasteners extending through sheathing into framing. Space fasteners at 12 to 18 inches (305 to 460 mm) on center along each framing member supporting sheathing.
   5. Where stud framing rests on concrete or masonry, extend lower edge of sheet at least 4 inches (100 mm) below bottom of framing and seal to foundation with sealant.
   6. Install water-resistive barrier over jamb flashings.
   7. Install air barrier and vapor retarder UNDER jamb flashings.
   8. Install head flashings under weather barrier.
   9. At openings to be filled with frames having nailing flanges, wrap excess sheet into opening; at head, seal sheet over flange and flashing.

F. Self-Adhesive Sheets:
   1. Prepare substrate in manner recommended by sheet manufacturer; fill and tape joints in substrate and between dissimilar materials.
   2. Lap sheets shingle-fashion to shed water and seal laps air tight.
   3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that all laps are firmly adhered with no gaps or fishmouths.
   4. Use same material, or other material approved by sheet manufacturer for the purpose, to seal to adjacent construction and as flashing.
   5. At wide joints, provide extra flexible membrane allowing joint movement.

G. Coatings:
   1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
   2. Use flashing to seal to adjacent construction and to bridge joints.

H. Openings and Penetrations in Exterior Weather Barriers:
   1. Coordinate all penetration flashing requirements with weather membrane manufacturer prior to installation.
   2. Install flashing over sills, covering entire sill frame member, extending at least 5 inches (125 mm) onto weather barrier and at least 6 inches (150 mm) up jambs; mechanically fasten stretched edges.

3. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with at least 4 inches (100 mm) wide; do not seal sill flange.
4. At openings to be filled with non-flanged frames, seal weather barrier to all sides of opening framing, using flashing at least 9 inches (230 mm) wide, covering entire depth of framing.
5. At head of openings, install flashing under weather barrier extending at least 2 inches (50 mm) beyond face of jambs; seal weather barrier to flashing.
6. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
7. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.4 FIELD QUALITY CONTROL

A. Do not cover installed weather barriers until required inspections have been completed.

B. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.

C. Take digital photographs of each portion of the installation prior to covering up.

3.5 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

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SECTION 07 4113
METAL ROOF PANELS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Structural roofing system of preformed steel panels.

B. Fastening system.

C. Factory finishing.

D. Accessories and miscellaneous components.

1.3 RELATED REQUIREMENTS

A. Section 05 3100 - Steel Deck.

B. Section 06 1000 - Rough Carpentry: Roof sheathing.

C. Section 07 2100 - Thermal Insulation: Rigid roof insulation.

D. Section 07 9005 - Joint Sealers: Field-installed sealants.

1.4 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2011.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

C. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010.

D. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.

E. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.

F. ASTM D4869/D4869M - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing; 2005 (Reapproved 2011)e1.

G. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2014.

H. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2011.

I. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference; 2005 (Reapproved 2012).

J. ASTM E1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference; 1995 (Reapproved 2011).

K. ASTM E1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems; 2011.

L. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2012.

M. ICC-ES AC188 - Acceptance Criteria for Roof Underlayments; 2012.

1.5 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Summary of test results, indicating compliance with specified requirements.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.

C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
   1. Show work to be field-fabricated or field-assembled.
   2. Include structural analysis signed and sealed by qualified structural engineer, indicating conformance of roofing system to specified loading conditions.
      a. Structural engineer is to be registered and licensed in the State of Louisiana.

D. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each roofing system specified, submit samples of minimum size 12 inches (305 mm) square, representing actual roofing metal, thickness, profile, color, and texture.

F. Manufacturer Qualification Statement: Provide documentation showing metal roof panel fabricator is accredited under IAS AC472.

G. Test Reports: Indicate compliance of metal roofing system to specified requirements.
   1. Design and Test Reports: Provide the following certified test reports from an independent testing laboratory:
      a. Independent laboratory testing report for system design load and seam integrity.
   2. Professional engineer's documentation that roofing system incorporates sufficient allowance for stress and movement.
   3. A letter from an officer of the manufacturing company certifying that the materials furnished for this project are the same as represented in tests and supporting data.
   4. Manufacturer's verifications that the panels are factory roll formed.
   5. ASTM E1592: Test results must clearly demonstrate compliance with the specified requirements.
   6. Mill production reports certifying that the material thicknesses are within allowable tolerances of the nominal or minimum thickness or gauge specified.
   7. Design Loads: Submit copy of manufacturer's minimum design load calculations according to latest version of ASCE 7, Method 2 for Components and Cladding, sealed by a registered professional engineer licensed in the State of Louisiana. In no case shall the design loads be taken to be less than those detailed in Design and Performance Criteria requirements.
   8. Installer Qualification Statement: Provide documentation showing roofing systen installer is certified by manufacturer for specified system.
   9. Manufacturer Work Progress Inspection Statement: Provide documentation indicating manufacturer's work progress inspection frequency.

H. Any material submitted as equal to the specified material must be accompanied by a report signed and sealed by a professional engineer licensed in the state in which the installation is to take place. This report shall show that the submitted equal meets the Design and Performance criteria in this specification. Substitution requests submitted without licensed engineer approval will be rejected for non-conformance.

I. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

J. Closeout Submittals.
   1. Special Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.
   2. Roofing Maintenance Instructions. Provide a manual of manufacturer's recommendations for maintenance of installed roofing systems.
   3. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.
   4. Demonstration and Training Schedule: Provide a schedule of proposed dates and times for instruction of Owner's personnel in the maintenance requirements for completed roofing work. Refer to Part 3 for additional requirements.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in the manufacture of roofing systems similar to those required for this project.
   1. Not less than 10 years ofdocumented experience.
   2. Accredited by IAS according to IAS AC472.

B. Installer Qualifications: Company trained and authorized by roofing system manufacturer.
   1. Engage an Installer who has completed the Manufacturer's Approved Roofing Contractor course and is currently certified for the installation of this roof system.
   2. Not less than 5 years of documented experience.

C. Source Limitations: Obtain all components of roof system from a single manufacturer, including roll goods materials if required. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.
   1. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.
   2. Manufacturer shall have direct authority and control over all fabrication of steel components as well as the raw materials used in their fabrication.

D. Source Quality Control: Manufacturer shall have in place a documented, standardized quality control program such as ISO-9001 approval.

E. Manufacturer's Inspections: Engage the Manufacturer's Field Representative to conduct required periodic inspections of work in progress as described herein and shall furnish written documentation of all such inspections.
   1. Manufacturer shall provide the project Owner with a written statement that they will provide a site inspection every 3 days that confirms that the project is being constructed as specified, by an experienced, full time employee of the company.
   2. Manufacturer shall perform a roof installation inspection at the site every 3 days to confirm that the project is being constructed as specified, by an experienced, full time employee of the company.
      a. Reports to include written and photographic observations of work in progress.
   3. Site visits are to last for a minimum of one hour, starting the first week of roof system (all components above roof deck/total, complete system) installation until roofing system completion and acceptance.
   4. Keep the Architect informed as to the progress and quality of the work as observed. Provide reports within 3 business days of site visit.
   5. Report to the Architect, in writing, any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
   6. Confirm, in writing, after installation completion that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.7 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project Site.
   1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of roof accessories and roof-mounted equipment.
   2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
   4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
   5. Review structural loading limitations of deck and purlins during and after roofing.
   6. Review flashings, special details, drainage, penetrations, equipment curbs, and condition of other construction that affect metal panels.
   7. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
   8. Review temporary protection requirements for metal panel systems during and after installation.
   9. Review procedures for repair of metal panels damaged after installation.
   10. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including temporary roofing installation.
   11. Review notification procedures for inclement weather or non-working days.
   12. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Provide strippable plastic protection on prefinished roofing panels for removal after installation.

B. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.
   1. Fully cover steel with tarpaulins or similar protective cover during transit to prevent dirt and debris from coming in contact with the finished goods.
   2. Unload roof panels using a boom or crane, supporting the panels in at least two locations during lifting, and never lift more than three panels at a time.
   3. Protect moisture-sensitive materials and water-based from the weather.

C. Inspect materials upon delivery. Reject and remove physically damaged or marred material from project site.

1.9 PROJECT CONDITIONS

A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage and protection requirements for roofing system.

1. Protection:
   a. Protect completed roofing from subsequent construction operations. Comply with Manufacturer's recommendations.
   b. Do not overload roof with stored materials.
   c. Support no roof-mounted equipment directly on the roofing system.

B. Ascertain that work of other trades which penetrates the roof or is to be made watertight by the roof is in place an approved prior to installation of roofing.

1.10 WARRANTY

A. See Section 01 7780 - Closeout Submittals, for additional warranty requirements.

B. Manufacturer shall execute a single warranty covering of the following criteria:
   1. Finish Warranty: Provide manufacturer’s special "No-Dollar-Limit" warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of 20 year period from date of Substantial Completion. Not to exceed 5 N.B.S. units.
   2. Waterproofing Warranty: Provide manufacturer’s "No-Dollar-Limit" warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of 20 years from date of Substantial Completion.
   3. Installer shall provide manufacturer with 2 year warranty, beginning from date of Substantialc Completion, covering roofing system installation and water tightness.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Design is based on ZEE-LOCK, manufactured by Berridge Manufacturing Company: www.berridge.com.

B. Metal Roof Panels:
   1. Petersen Aluminum Corporation; Tite-Loc Panel: www.pac-clad.com.
   2. Imetco Company, Inc.; Twin Lok Metal Roofing System: imetco.com.

C. Substitutions: See Section 01 6000 - Product Requirements.

2.2 STRUCTURAL METAL ROOF PANELS

A. Structural Metal Roofing: Provide complete roofing assemblies, including roof panels, clips, fasteners, connectors, and miscellaneous accessories, tested for conformance to the following minimum standards:
   1. Structural Design Criteria: Provide panel assemblies designed to safely support design loads at support spacing indicated, with deflection not to exceed 1/180 of the span.
      a. Design Loads: As indicated on structural drawings.

b. Dead Loads: Weight of roofing system.
c. Live Loads: As indicated on structural drawings.

2. Overall: Complete weathertight system tested and approved in accordance with ASTM E1592.
3. Air Infiltration: Maximum 0.06 cfm/sq ft (1.1 cubic meters/hr/sq m) at air pressure differential of 6.24 lbf/sq ft (300 Pa), when tested according to ASTM E1680.
4. Water Penetration: No water penetration when tested according to procedures and recommended test pressures of ASTM E1646. Perform test immediately following air infiltration test.
5. Thermal Movement: Design system to accommodate without deformation anticipated thermal movement over ambient temperature range of 120 degrees F (67 degrees C).
   a. Metal roofing system, including flashing, shall accommodate unlimited thermal movement without buckling or excess stress on the structure.
   b. Interface between panel and clip shall provide for unlimited thermal movement in each direction along the longitudinal direction.
   c. Location of metal roofing rigid connector shall be at roof ridge unless otherwise approved by the Project Architect. Metal ridge connector may require design as per job conditions by specified manufacturer.

B. Metal Panels: Factory-formed panels with factory-applied finish.
1. Type: Single skin, uninsulated.
2. Steel Panels:
   a. Zinc-coated SS (structural steel) sheet conforming to ASTM A653/A653M; minimum G90 (Z275) galvanizing.
   b. Steel Thickness: Minimum 24 gage (0.024 inch) (0.61 mm).
3. Profile: Standing seam, with minimum 2.0 inch (51 mm) seam height; concealed fastener system for field seaming with special tool.
4. Texture: Smooth.
5. Length: Full length of roof slope, without lapped horizontal joints.
6. Width: Maximum panel coverage of 16 inches (406 mm).
7. Provide manufactuer's vinyl weatherseal insert to be factory/machine installed over continuous zee-rib.

2.3 ATTACHMENT SYSTEM

A. Concealed System: Provide manufacturer's standard stainless steel concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

B. Fasteners: Stainless steel fasteners and washers.

2.4 SECONDARY FRAMING

A. Miscellaneous Secondary Framing: Light gauge steel framing incidental to structural supports; fabricated from steel sheet.

B. Framing Material: ASTM A 1011/A 1011M, Designation SS steel sheet.

1. Profile: Manufacturer's standard cee, zee, asymmetrical zee, hat channel, plain channel, single slope eave strut, double slope eave strut, and angle.
2. Thickness: 12 gauge, 0.1046 inch (2.657 mm).
3. Finish: Galvanized per ASTM A653/A653M, G90.

C. Framing Connectors: Factory-made formed steel sheet, ASTM A653/A653M SS Grade 50, with G60/Z180 hot dipped galvanized coating and factory punched holes.

2.5 PANEL FINISH

A. Fluoropolymer Coating System: Manufacturer’s standard multi-coat thermocured coating system, including minimum 70 percent fluoropolymer color topcoat with minimum total dry film thickness of 0.9 mil (0.023 mm); color and gloss as selected from manufacturer's full range.

2.6 ACCESSORIES AND MISCELLANEOUS ITEMS

A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, and caps of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation to be made of stainless steel.
   1. Downspouts: Open face, rectangular profile.
   2. All products are single-source by the metal panel manufacturer, without exception.

B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of closed-cell synthetic rubber, neoprene, or PVC.

C. Sealants: Manufacturer's recommended as specified in Section 07 9005.
   1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
      a. Color: As selected by Architect from sealant manufacturer's full range.
   2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
   3. Seam Sealant: Factory-applied, non-skinning, non-drying type.

D. Underlayment: Synthetic non-asphaltic sheet, intended by manufacturer for mechanically fastened roofing underlayment without sealed seams.
   1. Locate continuously over full span of roof.
   2. Type: Woven polypropylene with anti-slip polyolefin coating on both sides.
   3. Minimum Requirements: Comply with requirements of ICC-ES AC188 for non-self-adhesive sheet.
   4. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.
   5. Flammability: Minimum of Class A, when tested in accordance with ASTM E108.
   6. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
   7. Water Vapor Permeance: Vapor retarder; maximum of 1 perm (57.2 ng/(Pa s sq m)), when tested in accordance with ASTM E96/E96M Procedure A (desiccant method).
   8. Performance: Meet or exceed requirements for ASTM D226/D226M, Type II asphalt-saturated organic felt.

9. Liquid Water Transmission: Passes ASTM D4869/D4869M.
10. Fasteners: As specified by manufacturer and building code qualification report or approval, if any.
11. Products:
    a. Kirsch Building Products LLC; Sharkskin Ultra: www.sharkskin.us.
    b. Substitutions: See Section 01 6000 - Product Requirements.

E. Underlayment: Self-adhering rubber-modified asphalt sheet complying with ASTM D1970/D1970M; 40 mil (1.02 mm) total thickness; with strippable release film and woven polypropylene sheet top surface.
1. Locate as indicated on drawings at roof peak and roof eave conditions.
2. Minimum Requirements: Comply with requirements of ICC-ES AC188 for non-self-adhesive sheet.
3. Sheet Thickness: 40 mil (0.040 inch) (1 mm) minimum total thickness.
4. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.
5. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
6. Water Vapor Permeance: 0.05 perm (29 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant method).
7. Exposure to outdoor elements: 90 days, maximum.
8. Products: As recommended by roofing panel manufacturer, meeting the minimum requirements specified and the requirements of the specified system warranty.
    a. Henry Company; Blueskin PE200HT: www.henry.com.
    b. Grace Construction Products; Product Grace Ice and Water Shield HT: www.grace.com. **BASIS OF DESIGN**.
    c. Substitutions: See Section 01 6000 - Product Requirements.

2.7 FABRICATION

A. Panels: Fabricate panels and accessory items at factory, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.

B. Joints: Factory-install captive gaskets, sealants, or separator strips at panel joints to provide weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

C. Form flashing components from full single width sheet in longest practical lengths. Provide shop fabricated, mitered corners, joined using closed end pop rivets and joint sealant.

D. Fabricate roofing and related sheet metal work in accordance with approved shop drawings and applicable standards.

E. Hem all exposed edges of flashings on underside, a minimum of 1/2 inch (13 mm).

F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Coordination: Coordinate sequence and scheduling of standing seam roof panels and fascias with related work for proper installation and best in-place performance of all work.

B. Broom clean wood sheathing prior to installation of roofing system.

C. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to assure that the completed roof will be free of leaks.
   1. Do not proceed with installation until unsatisfactory conditions have been corrected.

D. Coordinate installation of waterproof membrane over roof sheathing with 06 1000.

E. Remove protective film from surface of roof panels immediately prior to installation. Strip film carefully, to avoid damage to prefinished surfaces.

F. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.

G. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.3 INSTALLATION

A. Overall: Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.
   1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
   2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.
   3. Install roof system when the atmospheric dry bulb temperature is minimum 40 degrees Fahrenheit and rising.

4. Install all components of the roof system in exact accordance with the manufacturer's standard published procedures as applicable to these project conditions and substrates.
5. Isolate dissimilar metals and masonry or concrete from metals with bituminous coating. Use gasketed fasteners where required to prevent corrosive action between fastener, substrate, and panels.
6. Limit exposed fasteners to extent indicated on shop drawings.
7. Anchorage shall allow for temperature expansion/contraction movement without stress or elongation of panels, clips, or anchors. Attach clips to structural substrate using fasteners of size and spacing as determined by manufacturer's design analysis to resist specified uplift and thermal movement forces.
8. Seal laps and joints in accordance with roofing system manufacturer's product data.
9. Coordinate flashing and sheet metal work to provide weather tight conditions at roof terminations. Fabricate and install in accordance with standards of SMACNA Manual.
10. Provide for temperature expansion/contraction movement of panels at roof penetrations and roof mounted equipment in accordance with system manufacturer's product data and design calculations.
11. Installed system shall be true to line and plane and free of dents, and physical defects.
12. Maximum variation from true planes or lines shall be one-fourth (1/4) inch in twenty (20) feet and three-eighths (3/8) inch in forty (40) feet of more.
13. Form joints in linear sheet metal to allow for one-fourth (1/4) inch minimum expansion at twenty (20) feet on center maximum and eight (8) feet from corners.
14. At joints in linear sheet metal items, set sheet metal items in two (2) one-fourth (1/4) inch beads of butyl sealant. Extend sealant over all metal surfaces. Mate components for positive seal. Allow no sealant to migrate onto exposed surfaces.
15. Remove damaged work and replace with new, undamaged components.
16. Touch up exposed fasteners using paint furnished by roofing panel manufacturer and matching exposed panel surface finish.
17. Clean exposed surfaces of roofing and accessories after completion of installation. Leave in clean condition at date of substantial completion. Touch up minor abrasions and scratches in finish.
18. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty four (24) hours, the Owner will exercise rights to correct the Work under the terms of the Conditions of the Contract.

B. Comply with all details and install roofing materials and flashings in accordance with approved shop drawings and manufacturer's product data, within specified erection tolerances.

C. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.

D. Install roofing underlayments on roof sheathing before installing preformed metal roof panels. Secure by methods acceptable to manufacturer and roof panel manufacturer. Apply from eaves to ridge in shingle fashion, overlapping horizontal joints and side and end laps as recommended by manufacturer. Off-set seams as recommended by manufacturer.

E. Roof Panels: Install panels in strict accordance with manufacturer's instructions, minimizing transverse joints except at junction with penetrations.
   1. Form weathertight standing seams incorporating concealed clips, using an automatic mechanical seaming device approved by the panel manufacturer.
   2. Install sealant or sealant tape, as recommended by panel manufacturer, at end laps and side joints.
   3. Roof panels are to be installed by starting from either end and working towards the opposite end.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Provide a factory-authorized service representative to inspect completed metal roof installation, including accessories. Report results in writing with comprehensive photographic representation of the installation.

B. Remove and replace applications of metal roof panels, accessories and necessary adjacent materials as required where inspections indicate that installation does not comply with specified requirements and standards.

C. Additional Inspections, at the Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.5 CLEANING

A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.6 PROTECTION

A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.

B. Touch-up, repair, or replace damaged roof panels or accessories before date of Substantial Completion.

3.7 FINAL INSPECTION

A. At completion of roofing installation and associated work, meet with Architect, installer, installer of associated work, Owner, roofing system manufacturer's representative and other representatives directly concerned with performance of roofing system.

B. Inspect roofing work and flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

C. Repair or replace deteriorated or defective work found at time of above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

D. Notify Architect upon completion of corrections.

E. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

3.8 DEMONSTRATION AND TRAINING

A. At a time and date agreed to by the Owner, instruct the Owner's facility manager, or other representative designated by the Owner, on the following procedures:
   1. Roof troubleshooting procedures.
   2. Notification procedures for reporting leaks or other apparent roofing problems.
   3. Roofing maintenance.
   4. The Owner's obligations for maintaining the roofing warranty in effect and force.
   5. The Manufacturer's obligations for maintaining the roofing warranty in effect and force.

END OF SECTION

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SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings and counterflashings.

B. Sealants for joints within sheet metal fabrications.

1.3 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood nailers for sheet metal work.

B. Section 07 4113 - Metal Roof Panels.

C. Section 07 9005 - Joint Sealers.

D. Section 08 4313 - Aluminum-Framed Storefronts.

1.4 REFERENCE STANDARDS

A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels; 2013.

B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

F. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

G. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

H. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

I. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.6 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as specified in this and other sections, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak or loosen and shall remain watertight.

B. Provide edge metal flashings (coping, fascia, gravel stop), except gutters to be designed, tested and installed in accordance with ANSI/SPRI ES-1, “American National Standard for Edge Systems Used for Low Slope Roof Systems” to comply with IBC 2012 Edition. Metal edge flashings shall be tested to meet basic wind speed as indicated in structural drawings.

C. Provide edge metal flashing by manufacturers with ANSI/SPRI ES-1 certification of compliance for all its qualified products. NRCA has performed testing and maintains a certification listing based on ANSI/SPRI ES-1 for specific edge metal flashing that are included in the construction detail section of the NRCA Roofing and Waterproofing Manual, latest edition and the NRCA Roofing Manual: Membrane Roof Systems - Latest Edition. NRCA has a certified listing of authorized fabricators and details of edge metal flashing acceptable.

D. Edge details may be selected from manufacturers who certify minimum performance to meet design requirements, based upon testing. Other designs may be used, provided that they are tested and certified by an independent testing laboratory to meet the wind and pullout resistance design standards suggested in the ES-1 Wind Design Standards.

1.7 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

C. Samples: Submit two samples 6 x 6 inch (152 x 152 mm) in size illustrating metal finish color.

1.8 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA 1793 and CDA A4050 requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 5 years of documented experience.

D. Work contained in this specification section associated with scopes of work and warranty terms and limits found in Section 07 5216 - Styrene-Butadiene-Styrene Modified Bituminous Roofing (SBS) will comply with and be executed jointly with the warranties found in Section 07 5216 to the full extent of those warranties requirements.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch (0.6 mm) thick base metal, shop pre-coated with PVDF coating.
   1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.

B. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 0.032 inch (0.8 mm) thick; plain finish shop pre-coated with fluoropolymer coating.
   1. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
   2. Color: As selected by Architect from manufacturer's full colors.

C. Stainless Steel: ASTM A666 Type 304, soft temper, 24 gage, 0.020 inch (0.511 mm) thick; smooth No. 4 finish.

2.2 ACCESSORIES

A. Fasteners: Stainless steel.

B. Underlayment: See Section 07 4113 - Metal Roof Panels.

C. Primer: Zinc chromate type.

D. Protective Backing Paint: As recommended by manufacturer.

E. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.
   1. As recommended by manufacturer.

F. Sealant to be Exposed in Completed Work: ASTM C920; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.
   1. As recommended by manufacturer.

G. Plastic Cement: ASTM D4586, Type I.

2.3 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats of same material as sheet, minimum 18 gage, minimum 2 inches (51 mm) wide, interlocking with sheet, unless indicated otherwise.
   1. As recommended by fabricator as coordinated with SMACNA standard detailing requirements to meet required wind loads and design pressures of ASCE 7 and IBC indicated on structural drawings.

C. Form pieces in longest possible lengths.

D. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

E. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

F. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.

G. Fabricate vertical faces with bottom edge formed outward 1/2 inch (13 mm) and hemmed to form drip.

H. Fabricate flashings to allow toe to extend 2 inches (50 mm), minimum, over roofing panel. Return and brake edges.

2.4 GUTTER AND DOWNSPOUT FABRICATION

A. Gutters: SMACNA (ASMM), Rectangular profile.

B. Downspouts: Rectangular profile.

C. Gutters and Downspouts:
   1. Gutter Size: 6 x 6 inch (152 x 152 mm), minimum.
   2. Downspout Size: 5 x 5 inch (127 x 127 mm), minimum.

D. Accessories: Profiled to suit gutters and downspouts.
   1. Anchorage Devices: In accordance with SMACNA requirements.
   2. Gutter Supports: Brackets.
   3. Downspout Supports: Straps.

a. Set downspouts 1/2 inch (13 mm) away from walls.

E. Splash Pads: Precast concrete type; minimum 3000 psi (21 MPa) at 28 days, with minimum 5 percent air entrainment.
1. Size: 12 wide x 24 long x 3 high inch (305 wide x 610 long x 76 high mm), minimum.
2. Color: Gray.
3. Manufacturers:
a. Oldcastle Precast: www.oldcastleprecast.com.
b. Modern Pre-Cast: www.modernprecast.com.
c. Mid State Concrete Products: www.midstateconcrete.com.

F. Seal metal joints.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

3.3 INSTALLATION

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.

E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
   1. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

F. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Apply primer if required by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer rather than nails for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps with roller. Cover underlayment within 14 days.

G. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.

H. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.
   1. **Use stainless-steel fasteners**.

I. Seal joints as shown and as required for watertight construction.
   1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
   2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."

J. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm) except where pre-tinned surface would show in finished Work.
   1. Do not solder aluminum sheet.

K. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

L. Apply plastic cement compound between metal flashings and felt flashings.

M. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

N. Seal metal joints watertight.

O. Secure gutters and downspouts in place using concealed fasteners.

P. Slope gutters 1/4 inch per 10 feet (2.1 mm per m), minimum.

Q. Set splash pads under downspouts.

3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal roof flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in SMACNA's "Architectural Sheet Metal Manual" and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.

C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Secure in a waterproof manner. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with elastomeric sealant.

D. Metal Base Flashing: Locate over membrane base flashing and secure with continuous cleat form compression seal. Fasten cleat at maximum 4 inches on center. Extend bottom flange of metal base flashing over roofing assembly and hold in place with insulation. Fill top well of cleat serving as metal base flashing termination bar with joint sealant.

3.5 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets and straps spaced not more than 36 inches (900 mm) apart. Provide end closures and seal watertight with sealant. Slope to downspouts.
   1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet (15.24 m) apart. Install expansion joint caps.
   2. Slope gutters not less than 1/8-inch per foot.

3. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c. in between. Provide elbows at base of downspouts to direct water away from building.

D. Splash Blocks: Install where downspouts discharge.

E. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches in direction of water flow.

3.6 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Division 04 Section "Unit Masonry."

C. Reglets: Shall be fastened, a maximum of 12-inches o.c., unless otherwise recommended per manufacturers written instructions.
   1. Insert counterflashing into reglet to form tight fit. Secure in place with wedges at maximum of 12-inches o.c. Seal flashing into reglets with sealant.

D. Openings Flashing in Frame Construction: Install continuous head, sill and similar flashings to extend 4 inches (100 mm) beyond wall openings.

3.7 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for field inspection requirements.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.8 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.9 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

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SECTION 07 8400
FIRESTOPPING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of all joints and penetrations in fire resistance rated and smoke resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.3 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 01 7329 - Cutting and Patching.

C. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.4 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. ASTM E330/M330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference, 2014.

C. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2014.

D. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a.

E. ASTM E1966 - Standard Test Method for Fire Resistive Joint Systems; 2007 (Reapproved 2011).

F. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2010.

G. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2013.

H. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2013.

I. ICC-Evaluation Service (ES) Report - NER 258.

J. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

K. FM 4991 - Approval Standard for Firestop Contractors; Factory Mutual Research Corporation; 2013.

L. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.

M. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

N. UL 1479: Fire Test of Through-Penetration Firestops.

O. UL 723: Surface Burning Characteristics of Building Materials.

P. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.5 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Sustainable Design Submittal: Submit VOC content documentation for all non-preformed materials.

E. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Installer Qualification: Submit qualification statements for installing mechanics.

1.6 DEFINITIONS

A. Definitions: As used in this Section, the following definitions apply:

1. Firestop systems: Complete, tested assemblies including wall/floor construction, penetrating items, and field-applied materials designed to prevent the spread of fire through openings.
2. Firestop devices: Factory-built products designed to resist the spread of fire through floor and wall openings, and require only assembly and installation at the project site.
3. Firestopping: Field-applied component materials of firestop systems, which form the seal against spreading fire.
4. Smoke seal systems: Systems designed to stop the spread of smoke through smoke walls. To be a smoke seal system, the system must have at least a one-hour fire-rating.

1.7 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide firestop systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.

B. F-Rated Systems: Provide firestop systems with F ratings indicated, as determined per ASTM E 814 and UL 1479, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.

C. T-Rated Systems: Provide firestop systems with T ratings, in addition to F ratings, as determined per ASTM E 814 and UL 1479, where any of the following conditions exist:
   1. Penetrations that incorporate penetrating items that is in contact with combustible materials in acceptable areas.
   2. Penetrations that are located outside of wall cavities and fire-resistive shaft enclosures.
   3. Penetrations that are located in construction containing doors required to have a temperature rise rating.
   4. Penetrations that incorporate penetrating items larger than a 4 inch diameter nominal pipe or 16 sq. in. in overall cross-sectional area.

D. Special Conditions: For firestopping exposed to traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.
   1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant firestop systems.
   2. For penetrations involving insulated piping, provide firestop systems not requiring removal of insulation.
   3. For firestopping exposed to view, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450, as determined per ASTM E 84.

1.8 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.

1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
4. Provide systems tested per ASTM E 814 under conditions where positive furnace pressure differential of at least 0.01 inch of water is maintained at a distance of 0.78 inch below the fill materials surrounding the penetrating items in the test assembly.
5. Provide firestopping products that bear the classification marking of qualified testing and inspecting agency.

B. Single Source Responsibility: Obtain firestopping for each type of penetration and construction condition from a single manufacturer.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

D. Installer Qualifications: Company specializing in performing the work of this section and:
1. Trained by the manufacturer.
2. Approved by Factory Mutual Research Corporation under FM 4991, or meeting any two of the following requirements:.
3. With minimum 3 years documented experience installing work of this type.
4. Able to show at least 5 satisfactorily completed projects of comparable size and type.
5. Licensed by authority having jurisdiction.

E. Selection: Contractor shall select firestop systems, based on information in the Contract Drawings and on conditions that are expected to exist during installation, from the acceptable types specified in this Section, to satisfy all of the following criteria:
1. Systems shall meet or exceed the required fire-resistance-rating of the construction involved at each penetration.
2. Systems shall be rated for installation in the type of construction involved at each penetration.
3. Systems shall be rated for use in conjunction with penetrating items of the type, size, and number involved at each penetration.

F. Asbestos: Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy."

G. Coordinating Work: Coordinate construction of openings and penetrating items to ensure that designated through-penetration firestop systems are installed per specified requirements.

H. Pre-Installation Conference: Before start of firestopping work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
   1. Require attendance with all parties directly influencing the quality of the work or affected by the performance of the work.
   2. Notify Architect well in advance of meeting.

I. Engineering Judgments: For those firestop applications that exist for which no approved tested system is available through a manufacturer, an engineering judgment derived from similar system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment drawings must follow requirements set forth by the International Firestop Council (September 7, 1994, as may be amended from time to time) and be provided via approved manufacturer.

1.9 MOCK-UP

A. Install one firestopping assembly representative of each fire rating design required on project.
   1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
   2. Where firestopping is intended to fill a linear opening, install minimum of 1 linear ft (1/3 linear m).

B. Obtain approval of authority having jurisdiction before proceeding.

C. If accepted, mock-up will represent minimum standard for the Work.

D. If accepted, mock-up may remain as part of the Work. Remove and replace mock-ups not accepted.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver firestopping products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multi-component materials.

B. Storage and Handling: Store and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.11 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

1. Ventilate application areas per firestopping manufacturer's instructions by natural means or, where this is inadequate, forced air circulation.

C. Sequencing and Scheduling: Commence firestopping in each location after penetrating items are complete and tested but prior to concealing the openings.
   1. Firestopping shall precede gypsum board finishing.

D. Agency Inspections: Do not conceal firestopping installations behind other construction until authorities having jurisdiction, if required, have examined each installation.

PART 2 PRODUCTS

2.1 FIRESTOPPING - GENERAL REQUIREMENTS

A. Manufacturers:
   1. 3M Fire Protection Products: www.3m.com/firestop.
   2. Hilti, Inc: www.us.hilti.com.
   3. Specified Technologies, Inc: www.stifirestop.com.
   4. Substitutions: See Section 01 6300 - Product Substitution Procedures.

B. Firestopping: Any material meeting requirements.

C. Firestopping Materials with Volatile Content: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.

D. Compatibility: Provide components that are compatible with each other, the substrates forming openings, and the penetrating items, if any, under conditions of service and application, as demonstrated by firestopping manufacturer's testing and field experience.

E. Accessories: Provide accessory components for each firestopping system specified by the firestopping manufacturer and approved for the designated fire-resistance-rated systems. Accessories include but are not limited to the following items:
   1. Permanent forming/damming/backing materials including the following:
      a. Semi-refractory fiber (mineral wool) insulation.
      b. Ceramic fiber.
      c. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.
      d. Fire-rated form board.
      e. Joint fillers for joint sealants.
   2. Temporary forming materials.
   3. Substrate primers.
   4. Metal collars and sleeves.

F. Mold Resistance: Provide firestoppping materials with mold and mildew resistance rating of 0 as determined by ASTM G21.

G. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

H. Fire Ratings: See Drawings for required systems and ratings.

2.2 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Perimeter Fire Containment Firestopping: Use any system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of the floor assembly.
   1. Movement: In addition, provide systems that have been tested to show movement capability as indicated.
   2. Temperature Rise: In addition, provide systems that have been tested to show T Rating as indicated.
   3. Air Leakage: In addition, provide systems that have been tested to show L Rating as indicated.
   4. Where floor assembly is not required to have a fire rating, provide systems that have been tested to show L Rating as indicated.
      a. Meeting ASTM E119.
   5. Refer to drawings for specific system locations.

B. Head-of-Wall Firestopping at Joints Between Non-Rated Floor and Fire-Rated Wall: Use any system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.
   1. Movement: In addition, provide systems that have been tested to show movement capability as indicated.

C. Through Penetration Firestopping: Use any system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
   1. Temperature Rise: In addition, provide systems that have been tested to show T Rating as indicated.
   2. Air Leakage: In addition, provide systems that have been tested to show L Rating as indicated.
   3. Watertightness: In addition, provide systems that have been tested to show W Rating as indicated.
   4. Listing by UL, FM, or Intertek in their certification directory will be considered evidence of successful testing.

2.3 MIXING

A. General: For those products requiring mixing prior to application, comply with firestopping manufacturer's directions to produce firestopping products of uniform quality for application indicated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examination: Examine substrates and conditions for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected, and penetrating items are complete and tested.

B. Verify openings are ready to receive the work of this section.

C. Environmental Conditions: Verify that environmental conditions are safe and suitable for installation of firestop products.

3.2 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

C. Install damming materials to arrest liquid material leakage.

3.3 CONDITIONS REQUIRING FIRESTOPPING

A. General: Provide firestopping for conditions specified whether or not firestopping is indicated, and if indicated, whether such material is designed as insulation, safeing, or otherwise.

B. Through-Penetrations: Firestopping shall be installed in all open penetrations and in the annular space in all penetrations in any bearing or non-bearing fire-rated barrier.

C. Membrane-Penetrations: Where required by code, all membrane-penetrations in rated walls shall be protected with firestopping products that meet the requirements of third party time/temperature testing.

D. Construction Joints/Gaps: Firestopping shall be provided at the following locations:
   1. Between the edges of floor slabs and exterior walls
   2. In the control joint in masonry walls and floors
   3. In expansion joints

E. Smoke-Stopping: Smoke-Stops shall be provided for Through-Penetrations, Membrane-Penetrations, and Construction Gaps with a material approved and tested for such application as required by other Sections as listed in 1.1. B "Related Sections".

3.4 INSTALLATION

A. General: Installation of firestops shall be performed by an applicator/installer qualified and trained by the manufacturer. Installation shall be performed in strict accordance with manufacturer's detailed installation procedures.
   1. Apply firestops in accordance with fire test reports, fire resistance requirements, acceptable sample installations, and manufacturer's recommendations.
   2. Coordinate with plumbing, mechanical, electrical and other trades, to assure that all pipe, conduit, cable, and other items, which penetrate fire-rated construction have been permanently installed prior to installation of firestops. Schedule and sequence the work to assure that partitions and other construction, which would conceal penetrations are not erected prior to the installation of firestops.
   3. Unless specified and approved, all insulation used in conjunction with through-penetrants shall remain intact and undamaged and may not be removed.
   4. Seal holes and penetrations to ensure an effective smoke seal.
   5. In areas of high traffic, protect firestopping materials from damage. If the opening is large, install firestopping materials capable of supporting the weight of a human.
   6. Insulation types specified in other Sections shall not be installed in lieu of firestopping material specified herein.
   7. All combustible penetrants (e.g. non-metallic pipes or insulated metallic pipes) shall be firestopped using products and systems tested in a configuration representative of the field condition.

B. Dam Construction: When required to properly contain firestopping materials within openings, damming or packing materials may be utilized. Combustible damming material must be removed after appropriate curing. Noncombustible damming materials may be left as a permanent component of the firestop system.

C. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

D. Do not cover installed firestopping until inspected by authority having jurisdiction.

E. Install labeling required by code.

3.5 FIELD QUALITY CONTROL

A. Maintain onsite copy of submittal package including system drawings.

B. Prepare and install firestopping systems in accordance with manufacturer's printed instructions and recommendations.

C. Follow safety procedures recommended in the Material Safety Data Sheets.

D. Finish surfaces of firestopping, which are to remain exposed in the completed work to a uniform and level condition.

E. Accessibility: All areas of work must be accessible until inspection by the applicable Code Authorities.

F. Correct unacceptable firestops and provide additional inspection to verify compliance with this specification at no additional cost.

3.6 CLEANING

A. Clean adjacent surfaces of firestopping materials.
   1. Remove excess firestopping materials as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

3.7 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

B. Protect firestopping during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so that firestop systems are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to produce firestop systems complying with specified requirements.

END OF SECTION

SECTION 07 9005
JOINT SEALERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Sealants and joint backing.

B. Precompressed foam sealers.

1.3 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 04 2000 - Unit Masonry.

C. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.

D. Section 07 6200 - Sheet Metal Flashing and Trim.

E. Section 07 8400 - Firestopping: Firestopping sealants.

F. Section 08 1113 - Hollow Metal Doors and Frames.

G. Section 08 4313 - Aluminum-Framed Storefronts: frame edge sealants at adjoining construction.

H. Section 08 8000 - Glazing: Glazing sealants and accessories.

I. Section 09 2116 - Gypsum Board Assemblies: Acoustic sealant.

J. Section 09 3000 - Tiling: Sealant used as tile grout.

K. Section 09 9000 - Painting and Coating.

1.4 REFERENCE STANDARDS

A. ASTM C834 - Standard Specification for Latex Sealants; 2010.

B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012.

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

E. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2010.

F. ASTM C1472 - Standard Guide for Calculating Movement and Other Effects When Establishing Sealant Joint Width; 2010.

G. SWRI - Sealants the Professional's Guide; 2013.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with other sections referencing this section.

1.6 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.7 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
   1. For each joint-sealant product indicated.

C. Samples: Submit two samples illustrating sealant colors for selection.

D. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.

E. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

F. Qualification Data: Submit qualification data for firms and persons specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

G. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, submit the following reports:
   1. Compatibility and adhesion test reports from elastomeric sealant manufacturer indicating that materials forming joint substrates and joint sealant backings have been tested for compatibility and adhesion with joint sealants. Include sealant manufacturer's recommendations for primers and substrate preparation needed to obtain adhesion.

2. Product test reports for each type of joint sealer, evidencing compliance with requirements specified.

H. Warranties: Special warranties specified in this Section and Division 1.

1.8 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

D. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.9 MOCK-UP

A. Provide mock-up of sealant joints in conjunction with window, wall, and air barrier system under provisions of Section 01 4000.

B. Construct mock-up with specified sealant types and with other components noted.
   1. To verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:
   2. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

C. Locate where directed by Architect.

D. Mock-up may remain as part of the Work.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials in compliance with manufacturer’s written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.11 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

B. Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.12 WARRANTY

A. See Section 01 7780 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

D. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

E. Special Installer’s Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Two years from date of Substantial Completion

F. Special Manufacturer’s Warranty: Written warranty, signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: 20 years from date of Substantial Completion.

G. Exclusions: Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
   1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer’s written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
   2. Disintegration of joint substrates from natural causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or other outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 PRODUCTS

2.1 SEALANTS

A. Type JS-1 - General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25 minimum; Uses M, G, and A; single component.
   1. Color: To be selected by Architect from manufacturer's full range.
   2. Applications: Use for:
      a. Control, expansion, and soft joints in masonry.
         1)
      b. Joints between concrete and other materials.
      c. Joints between metal frames and other materials.
      d. Other exterior joints for which no other sealant is indicated.
      e. Joints that are up to 1/2 inch (13 mm) wide, maximum.
   3. Polyurethane Products:
      a. Pecora Corporation; DynaTrol I-XL General Purpose One Part Polyurethane Sealant: www.pecora.com.
      b. BASF Construction Chemicals-Building Systems; MasterSeal NP 1: www.buildingsystems.basf.com.
      c. Tremco Commercial Sealants and Waterproofing; Vulkem 116: www.tremcosealants.com.
      d. Substitutions: See Section 01 6300 - Product Substitution Procedures.

B. Type JS-2 - Exterior Expansion Joint Sealer: Precompressed foam sealer; urethane with water-repellent;
   1. Face color: To be selected from manufacturer's full range by Architect.
   2. Size as required to provide weathertight seal when installed.
   3. Provide product recommended by manufacturer for traffic-bearing use.
   4. Applications: Use for:
      a. Exterior wall expansion joints.
      b. Joints in excess of 1/2 inch (13 mm) wide.
   5. Products:
      a. EMSEAL Joint Systems, Ltd; 25V Pre-Formed Expanding Foam Sealant: www.emseal.com.
      b. Dayton Superior Corporation; Polytite R Pre-Compressed Joint Sealant: www.daytonsuperior.com.
      c. Tremco Global Sealants; Illmod 600 Pre-Compressed Impregnated Foam Seal: www.tremcosealants.com.
      d. Substitutions: See Section 01 6300 - Product Substitution Procedures.

C. Type JS-3 - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
   1. Applications: Use for:
      a. Concealed sealant bead in sheet metal work.
      b. Concealed sealant bead in siding overlaps.
   2. Products:
      a. As recommended by metal panel manufacturer.

D. Type JS-4 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
   1. Applications: Use for:
      a. Interior wall and ceiling control joints.
      b. Joints between door and window frames and wall surfaces.
      c. Other interior joints for which no other type of sealant is indicated.
   2. Products:
      a. Pecora Corporation; AC-20 + Silicone Acrylic Latex Caulking Compound: www.pecora.com.
      b. Sherwin-Williams Company; 850A Acrylic Latex Caulk: www.sherwin-williams.com.
      c. Sherwin-Williams Company; 950A Siliconized Acrylic Latex Caulk: www.sherwin-williams.com.
      d. Tremco Global Sealants; Trimflex 834 Siliconized Interior Acrylic Latex Sealant: www.tremcosealants.com.
      e. Substitutions: See Section 01 6300 - Product Substitution Procedures.

E. Type JS-5 - Bathtub/Tile Sealant: White silicone; ASTM C920, Uses I, M and A; single component, mildew resistant.
   1. Applications: Use for:
      a. Joints between plumbing fixtures and floor and wall surfaces.
      b. Joints between kitchen and bath countertops and wall surfaces.
   2. Products:
      a. Pecora Corporation; 898NST Sanitary Silicone Sealant - Class 50: www.pecora.com.
      b. Tremco Global Sealants; Tremsil 200 General Construction Grade Silicone Sealant - White: www.tremcosealants.com.
      c. Dow Corning Corporation; 786 Sealant M White: www.dowcorning.com.
      d. Momentive Performance Materials Inc./General Electric Company; SCS1700 Sanitary Silicone Sealant: www.ge.com/silicones
      e. Substitutions: See Section 01 6300 - Product Substitution Procedures.

F. Type JS-6 - Acoustical Sealant for Concealed Locations:
   1. Composition: Acrylic latex emulsion sealant.
   2. Applications: Use for concealed locations only and as recommended by manufacturer:
      a. Sealant bead(s) to be located as recommended by manufacturer for best acoustical performance.
   3. Products:
      a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant: www.pecora.com.
      b. Tremco Global Sealants; Acoustical Sealant Sound Damping Sealant: www.tremcosealants.com.
      c. Hilti, Inc.; CP 506 Smoke and Acoustical Sealant: www.us.hilti.com.
      d. Substitutions: See Section 01 6300 - Product Substitution Procedures.

G. Type JS-7 - Concrete Paving Joint Sealant: Polyurethane, self-leveling; ASTM C920, Class 25, Uses T, I, M and A; multi- component.

1. Color: As selected from manufacturer's full range by Architect.
2. Applications: Use for:
   a. Joints in sidewalks and vehicular paving.
3. Products:
   a. Pecora Corporation; DynaTrol II-SG Self Leveling, Polyurethane Slope Grade, Traffic-Grade Sealant: www.pecora.com.
   b. BASF Construction Chemicals-Building Systems; Sonolastic SL 2 Self-Leveling Polyurethane Sealant: www.buildingsystems.basf.com.
   c. Sika Corporation; Sikaflex -2c SL Self-Leveling, Polyurethane Elastomeric Sealant: www.sikausa.com.
   d. Substitutions: See Section 01 6300 - Product Substitution Procedures.

H. Type JS-8 - Butyl Sealant: ASTM C1311; single component, solvent release, non-skinning, non-sagging.
1. Color: To be selected by Architect from manufacturer's full range.
2. Movement Capability: Plus and minus 10 percent.
3. Service Temperature Range: -13 to 180 degrees F (-25 to 82 degrees C).
4. Applications: Use for:
   a. Bedding opening thresholds.
5. Products:
   a. Pecora Corporation; BC-158 Butyl Rubber Sealant: www.pecora.com.
   b. Tremco Global Sealants; Tremco Butyl Sealant General Purpose Butyl Sealant: www.tremcosealants.com.
   c. Substitutions: See Section 01 6300 - Product Substitution Procedures.

I. Type JS-9 - Silicone Sealant: ASTM C920, Grade NS, Class 50, Uses NT, A, G, M, O; single component, neutral curing, non-sagging, non-staining, non-bleeding.
1. Color: To be selected by Architect from manufacturer's full range.
2. Movement Capability: Plus and minus 50 percent.
3. Service Temperature Range: -40 to 250 degrees F (-40 to 121 degrees C).
4. Shore A Hardness Range: 15 to 35.
5. Applications: Use for:
   a. Perimeter sealing of metal framed opening edges adjacent to other construction.
6. Products:
   a. Refer to Section 07 2500 - Weather Barriers for the specified weather barrier system and the compatible sealant to be used. The sealant is to be as recommended by the manufacturer of the weather barrier system being used on the project without exception.
   b. Substitutions: See Section 01 6300 - Product Substitution Procedures.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Verify that substrate surfaces are ready to receive work.

C. Verify that joint backing and release tapes are compatible with sealant.

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

3.2 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.
   1. Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
      a. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
      b. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
         1) Concrete.
         2) Masonry.
         3) Unglazed surfaces of ceramic tile.
      c. Remove laitance and form-release agents from concrete.
      d. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
         1) Metal.
         2) Glass.
         3) Glazed surfaces of ceramic tile.

C. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

D. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

E. Protect elements surrounding the work of this section from damage or disfigurement.
   1. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
   1. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Perform installation in accordance with ASTM C1193.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

E. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

F. Install bond breaker where joint backing is not used.
   1. Between sealants and backs of joints.

G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

H. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
   1. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
      a. Place sealants so they directly contact and fully wet joint substrates.
      b. Completely fill recesses in each joint configuration.

c. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

I. Tool joints concave.
1. Tooling of Non-sag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
a. Remove excess sealant from surfaces adjacent to joints.
b. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
c. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
d. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
e. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
f. Use masking tape to protect surfaces adjacent to recessed tooled joints.

J. Installation of Preformed Tapes: Install according to manufacturer's written instructions.

K. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch (3 to 6 mm) below adjoining surface.
1. Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 CLEANING

A. Clean adjacent soiled surfaces.
1. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect sealants until cured.
1. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 SCHEDULE

A. Exterior Joints for Which No Other Sealant Type is Indicated: Type JS-9 color as selected by Architect from manufacturer's full range..

B. Control and Expansion Joints in Paving: Type JS-7.

C. Exterior Wall Expansion Joints: Type JS-2 or JS-9 as condition dictates.

D. Control, Expansion, and Soft Joints in Masonry, and Between Masonry and Adjacent Work: Type JS-2 or JS-9 as condition dictates.

E. Vertical control and expansion joints on exposed interior surfaces of exterior walls: Type JS-1.

F. Vertical joints on exposed surfaces of interior unit masonry, concrete walls, and partitions: Type JS-1.

G. Lap Joints in Exterior Sheet Metal Work: Type JS-3.

H. Butt Joints in Exterior Metal Work and Siding: Type JS-3.

I. Joints Between Exterior Metal Frames and Adjacent Work (except masonry): Type JS-9.

J. Under Exterior Door Thresholds: Type JS-8.

K. Interior Joints for Which No Other Sealant is Indicated: Type JS-4; .

L. Joints Between Plumbing Fixtures and Walls and Floors, and Between Countertops and Walls: Type JS-5.

M. In STC-Rated Walls, Between Metal Stud Track/Runner and Adjacent Construction, Between Outlet Boxes and Gypsum Board, and as recommended by sealant manufacturer for each condition and intended use: Type JS-6.

END OF SECTION

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SECTION 07 9513
EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Expansion joint cover assemblies for floor, wall, ceiling, and soffit surfaces.

1.3 RELATED REQUIREMENTS

A. Section 07 9005 - Joint Sealers.

B. Section 09 2116 - Gypsum Board Assemblies: Placement of expansion joint assemblies in gypsum board walls and ceilings.

1.4 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

C. ASTM B308/B308M - Standard Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles; 2010.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Installation Templates: For frames and anchors to be embedded in concrete or masonry, furnish templates to relevant installers; include installation instructions and tolerances.

1.6 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide joint assembly profiles, profile dimensions, anchorage devices, available colors and finish, and product literature.

C. Shop Drawings: Indicate joint and splice locations, miters, layout of the work, effected adjacent construction, anchorage locations, and installation details for each condition.

D. Samples: Submit two samples 6 inch (152 mm) long (or size appropriate), illustrating profile, dimension, color, and finish selected.
   1. Samples for Initial Selection: For each type of expansion control system indicated.
      a. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric seal material.
   2. Samples for Verification: For each type of expansion control system indicated, full width by 6 inches (150 mm) long (or size appropriate) in size.

E. Product Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
   1. Manufacturer and model number for each expansion control system.
   2. Expansion control system location cross-referenced to Drawings.
   3. Nominal joint width.
   4. Movement capability.
   5. Classification as thermal or seismic.
   6. Materials, colors, and finishes.
   7. Product options.
   8. Fire-resistance ratings.

F. Product Test Reports: For each fire barrier provided as part of an expansion control system, for tests performed by a qualified testing agency.

G. Manufacturer's Installation Instructions: Indicate rough-in sizes and required tolerances for item placement.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 for additional provisions.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Approved by manufacturer.

B. Source Limitations: Obtain all architectural joint systems through one source from a single manufacturer.

C. Drawings indicate size, profiles, and dimensional requirements of architectural joint systems and are based on the specific systems indicated.
   1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

D. Loading Characteristics: Standard loading refers to covers that are capable of withstanding up to 500 lb. point loads. Heavy duty refers to covers that are capable of withstanding up to 2000 lb. point loads.

1.8 COORDINATION

A. Coordinate installation of adjacent materials and associated systems with joint protection system to ensure that all transistions are airtight or weathertight.

1.9 WARRANTY

A. Manufacturer to provide 5 year warranty for all joint cover systems and associated anchoring components.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

A. General: Provide expansion control systems of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
   1. Furnish units in longest practicable lengths to minimize field splicing. Install with hairline mitered corners where expansion control systems change direction or abut other materials.
   2. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion control systems.

B. Coordination: Coordinate installation of exterior wall and soffit expansion control systems to ensure that wall transitions are watertight. Roof and exterior wall expansion joint assemblies are specified elsewhere.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: Where indicated, provide expansion control systems with fire barriers identical to those of systems tested for fire resistance per UL 2079 or ASTM E 1966 by a testing and inspecting agency acceptable to authorities having jurisdiction.

B. Seismic Performance: Expansion control systems shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
   1. The term "withstand" means "the system will remain in place without separation of any parts when subjected to the seismic forces specified ."
   2. Component Importance Factor is as indicated on structrual drawings.

2.3 MANUFACTURERS

A. Expansion Joint Cover Assemblies:
   1. Construction Specialties, Inc: www.c-sgroup.com. **BASIS OF DESIGN**.
   2. Nystrom, Inc: www.nystrom.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.4 EXPANSION JOINT COVER ASSEMBLY APPLICATIONS

A. Interior Floor Joints Subject to Thermal Movement:
   1. Products:
      a. Construction Specialties; RFD Series and RFWD Series. **BASIS OF DESIGN**.
      b. Nystrom; PD Series and PDW Series.

B. Interior Wall/Ceiling Joints Subject to Thermal Movement:
   1. Products:
      a. Construction Specialties; ASM Series and ASMC Series. **BASIS OF DESIGN**.
      b. Nystrom; WJ Series and WJ-W Series.

C. Exterior Soffit Joints Subject to Thermal Movement:
   1. Products:
      a. Construction Specialies; ASM-X and ASMC-X Series. **BASIS OF DESIGN**.
      b. Nystrom; EJ-RJX Series and EJ-RJX-W Series.

2.5 EXPANSION JOINT COVER ASSEMBLIES

A. Expansion Joint Cover Assemblies - General: Factory-fabricated and assembled; designed to completely fill joint openings, sealed to prevent passage of air, dust, water, smoke; suitable for traffic expected.
   1. Joint Dimensions and Configurations: As indicated on drawings.
   2. Joint Cover Sizes: Selected to suit joint width and configuration, based on manufacturer's published recommendations and limitations.
   3. Joint Cover Styles: As indicated on drawings.
   4. Joint Movement Capability: If not indicated, provide minimum plus/minus 25 percent joint movement capability.
   5. Lengths: Provide covers in full lengths required; avoid splicing wherever possible.
   6. Anchors, Fasteners, and Fittings: Provided by cover manufacturer.

B. Floor Joint Covers: Coordinate with indicated floor coverings.
   1. If floor covering is not indicated, obtain instructions from Architect before proceeding.
   2. If style is not indicated, provide extruded aluminum frame both sides, resilient seals, and minimize exposed metal.

C. Sliding Cover Plate Type Covers: Provide plate with beveled edges and neat fit that does not collect dirt.

D. Covers In Gypsum Board Assemblies: Provide style with anchoring wings that can be completely covered by joint compound.

2.6 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper; or ASTM B308/B308M, 6061 alloy, T6 temper.
   1. Exposed Finish Outdoors: Natural anodized.

2. Exposed Finish at Floors: Mill finish or natural anodized.
3. Exposed Finish at Walls and Ceilings: Natural anodized.

B. Anchors and Fasteners: As recommended by cover manufacturer.

C. Ferrous Metal Anchors: Galvanized where embedded in concrete or in contact with cementitious materials.

D. Threaded Fasteners: Stainless steel.

E. Backing Paint for Aluminum Components in Contact with Cementitious Materials: Asphaltic type.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that joint preparation and dimensions are acceptable and in accordance with manufacturer's requirements.
   1. Examine surfaces where expansion control systems will be installed for installation tolerances and other conditions affecting performance of work.

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

3.2 PREPARATION

A. Prepare substrates according to expansion control system manufacturer's written instructions.

B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion control systems. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion control systems.

C. Cast-In Frames: Coordinate and furnish frames to be cast into concrete.

3.3 INSTALLATION

A. Install components and accessories in accordance with manufacturer's instructions.
   1. Comply with manufacturer's written instructions for storing, handling, and installing expansion control systems and materials unless more stringent requirements are indicated.

B. Align work plumb and level, flush with adjacent surfaces.
   1. Metal Frames: Perform cutting, drilling, and fitting required to install expansion control systems.
      a. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
      b. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation. Notify Architect

where discrepancies occur that will affect proper expansion control system installation and performance.

c. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.

d. Repair or grout blockout as required for continuous frame support using nonmetallic, shrinkage-resistant grout.

e. Install frames in continuous contact with adjacent surfaces.

1) Shimming is not permitted.

f. Locate anchors at interval recommended by manufacturer, but not less than 3 inches (75 mm) from each end and not more than 24 inches (600 mm) o.c.

2. Seals in Metal Frames: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.

a. Provide in continuous lengths for straight sections.

b. Seal transitions according to manufacturer's written instructions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.

c. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.

3. Compression Seals: Apply adhesive or lubricant adhesive as recommended by manufacturer to both [frame interfaces] [sides of slabs] before installing compression seals.

4. Foam Seals: Install with adhesive recommended by manufacturer.

5. Epoxy-Bonded Seals: Pressurize seal for time period and to pressure recommended by manufacturer. Do not overpressurize.

6. Terminate exposed ends of expansion control systems with field- or factory-fabricated termination devices.

7. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion control system materials and associated work so complete assemblies comply with assembly performance requirements.

a. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

8. Moisture Barrier: Provide at all exterior joints and where indicated on Drawings. Provide drainage fittings at a maximum of 50 feet (15.2 m) or where indicated on Drawings.

C. Rigidly anchor to substrate to prevent misalignment.

3.4 PROTECTION

A. Do not permit traffic over unprotected floor joint surfaces.

B. Provide strippable coating to protect finish surface.

1. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

2. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over expansion control systems. Reinstall cover plates or seals prior to Substantial Completion of the Work.

END OF SECTION

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DIVISION 8

OPENINGS

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SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Non-fire-rated steel doors and frames.

B. Steel frames for wood doors.

C. Thermally insulated steel doors.

1.3 RELATED REQUIREMENTS

A. Section 04 2000 - Unit masonry.

B. Section 08 7100 - DOOR HARDWARE.

C. Section 09 2116 - Gypsum Board Assemblies.

D. Section 09 9000 - Painting and Coating: Field painting.

1.4 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2009.

C. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2007 (R2011).

D. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

G. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.

H. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014. (ANSI/BHMA A156.115)

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).

J. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.

K. NAAMM HMMA 860 - Guide Specifications for Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2013.

L. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2006.

M. NAAMM HMMA 865 - Guide Specifications for Sound Control Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2013.

N. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2012.

O. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

P. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.5 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.

C. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

D. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
   1. Elevations of each door design.
   2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   4. Locations of reinforcement and preparations for hardware.
   5. Details of anchorages, joints, field splices, and connections.
   6. Details of accessories.

7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

C. Quality Standard: In addition to requirements specified, comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

D. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

E. **Wind Loads**: At exterior locations, provide door hardware with hollow metal assemblies capable of withstanding windload design pressures which are calculated, certified, stamped and signed, for this project by a qualifiied/registered professional, licensed in the State of Louisiana, meeting or exceeding the design load requirements as indicated on the structural drawings.

F. **Hurricane-Resistance Test Performance**: At exterior locations, provide door hardware with hollow metal approved assemblies that pass large missile-impact tests and cyclic-pressure tests according to testing requirements of authorities having jurisdiction.
   1. **Impact Resistance**: Door Hardware approved assemblies must satisfy the criteria for protection from windborne debris. The assemblies must have passed the large missile impact test (which equates to Missile Level D specified in ASTM E 1996-14a). The assemblies may be installed at any height on the structure as long as the design pressure rating for the assemblies is not exceeded.

G. Maintain at the project site a copy of all reference standards dealing with installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
   1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

D. Store in accordance with NAAMM HMMA 840.

E. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

F. Replace items damaged during delivery, unless damage is minor and can be repaired to match intact systems, as determined by Architect.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.9 COORDINATION

A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Steel Doors and Frames:
   1. Assa Abloy Ceco, Curries, or Fleming: www.assaabloydss.com.
   2. Republic Doors: www.republicdoor.com.
   3. Steelcraft, an Allegion brand: www.allegion.com/us.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.2 DOORS AND FRAMES

A. Requirements for All Doors and Frames:

1. Accessibility: Comply with ICC A117.1 and ADA Standards.
2. Door Top Closures: Flush with top of faces and edges.
3. Door Edge Profile: Beveled on both edges.
4. Door Texture: Smooth faces.
5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
7. Galvanizing for Units in Wet Areas: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.3 STEEL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8.

B. Exterior Doors:
1. Grade: ANSI/SDI A250.8 (SDI-100); Level 3 - Extra Heavy-Duty, Physical Performance Level A, Model 2 - Seamless.
2. Core: Polystyrene.
3. Thickness: 1-3/4 inch (44.5 mm).
4. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
5. Insulating Value: U-value of 0.33 minimum, when tested in accordance with ASTM C1363.
6. Weatherstripping: Integral, recessed into door edge or frame.
7. Finish: Factory primed, and field finished.

2.4 STEEL FRAMES

A. General:
1. Comply with the requirements of grade specified for corresponding door, except:
   a. ANSI/SDI A250.8 (SDI-100), Level 3 Door Frames: 14 gage, 0.067 inch (1.7 mm), minimum thickness.
   b. Frames for Metal and Wood Doors: Comply with frame requirements in accordance with ANSI/SDI A250.8 (SDI-100), Level 2, 16 gage, 0.053 inch (1.3 mm), minimum thickness.
2. Finish: Factory primed, for field finishing.

3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
4. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches (100 mm) high to fill opening without cutting masonry units.
5. Frames Wider than 48 Inches (1219 mm): Reinforce with steel channel fitted tightly into frame head, flush with top.
6. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.

B. Exterior Door Frames: Face welded.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.
2. Weatherstripping: Separate, see Section 08 7100.

C. Interior Door Frames, Non-Fire-Rated: Face welded type.

2.5 FRAME ANCHORS

A. Jamb Anchors:
1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
3. Windstorm Opening Anchors: Types as tested and required for indicated wall types to meet specified wind load design criteria.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 ACCESSORY MATERIALS

A. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.

B. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.

C. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

D. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.7 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for

thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors:
   1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.

D. Hollow Metal Frames:
   1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
   2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
      a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
   3. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
   4. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
   5. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
   6. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
   7. Jamb Anchors: Provide number and spacing of anchors as follows:
      a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
         1) Two anchors per jamb up to 60 inches high.
         2) Three anchors per jamb from 60 to 90 inches high.
         3) Four anchors per jamb from 90 to 120 inches high.
         4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
      b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
         1) Three anchors per jamb up to 60 inches high.
         2) Four anchors per jamb from 60 to 90 inches high.
         3) Five anchors per jamb from 90 to 96 inches high.
         4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
         5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.

8. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
   1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
   2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
   3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

2.8 FINISH MATERIALS

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
   1. Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
      a. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.
   1. Use at conditions with grouted frames and at conditions with dissimilar metals in close proximity to one another.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.
   1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify that opening sizes and tolerances are acceptable.
   1. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer .

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

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

E. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.

C. Coordinate frame anchor placement with wall construction.

D. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
   1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
   2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
   3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.

E. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
   1. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

F. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
   1. Non-Fire-Rated Standard Steel Doors:
      a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
      b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.

c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

G. Coordinate installation of hardware.

H. Touch up damaged factory finishes.

3.4 TOLERANCES

A. Clearances Between Door and Frame: As specified in ANSI A250.8.

B. Maximum Diagonal Distortion: 1/16 in (1.5 mm) measured with straight edge, corner to corner.

3.5 ADJUSTING

A. Adjust for smooth and balanced door movement.
   1. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Adjust doors so that seals are fully engaged when door is closed.

C. Test doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

D. Remove grout and other bonding material from hollow metal work immediately after installation.

E. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

3.6 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 08 1416
FLUSH WOOD DOORS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration; non-rated.

1.3 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 7100 - DOOR HARDWARE.

C. Section 08 8000 - Glazing.

D. Section 09 9000 - Painting and Coating: Field finishing of doors.

1.4 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

C. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.

D. AWI (QCP) - Quality Certification Program, www.awiqcp.org; current edition at www.awiqcp.org.

E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

F. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2013

G. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2012.

H. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

I. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.5 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
   1. For each type of door indicated. Include details of core and edge construction, louvers, trim for openings, and WDMA I.S.1-A or AWS classifications. Include factory finishing specifications.

C. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the wood door supplier in order to prepare the doors and frames to receive the finish hardware items.

D. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
      a. Indicate dimensions and locations of mortises and holes for hardware.
      b. Indicate dimensions and locations of cutouts.
      c. Indicate requirements for veneer matching.
      d. Indicate doors to be factory finished and finish requirements.
      e. Indicate fire protection ratings for fire rated doors.
   2. Provide the information required by AWI/AWMAC/WI (AWS).
   3. Include certification program label.

E. Specimen warranty.

F. Samples: Submit two samples of door veneer, 8 by 10 inch (203 by 254 mm) in size illustrating paint grade veneer.

G. Samples: Frames for light openings, 6 inches long, for each material, type, and finish required.

H. Manufacturer's Installation Instructions: Indicate special installation instructions.

I. Warranty, executed in Owner's name.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer wherever possible.

B. Maintain one copy of the specified door quality standard on site for review during installation and finishing.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum 10 years of documented experience.

1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

D. Quality Certification: Provide AWI (QCP) inspection report and quality certification of completed work.
   1. Provide labels or certificates indicating that the work complies with requirements of AWI/AWMAC/WI (AWS) grade or grades specified.
   2. Prior to delivery to the site provide shop drawings with certification labels.
   3. Provide labels on each product when required by certification program.
   4. Upon completion of installation provide certificate certifying that the installation and products meet the specified requirements.
   5. Arrange and pay for inspections required for certification.
   6. Replace, repair, or rework all work for which certification is refused.

E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for receiving, handling, and installing flush wood doors.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

D. Mark each door on top rail with opening number used on Shop Drawings.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.9 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

D. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
   b. Telegraphing of core construction in wood face veneers exceeding 0.01 inch in a 3-inch span.
   c. Telegraphing of core construction and delaminating of face in decorative laminate-faced doors.
2. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid Core Interior Doors: Life of installation according to manufacturer's written warranty.

PART 2 PRODUCTS

2.1 DOOR CONSTRUCTION - GENERAL

A. WDMA I.S.1-A Performance Grade: Extra Heavy Duty; Aesthetic Grade: Premium.

2.2 MANUFACTURERS

A. Wood Veneer Faced Doors:
   1. Algoma Hardwoods, Inc.: www.algomahardwoods.com.
   2. Eggers Industries: www.eggersindustries.com.
   3. Graham Wood Doors: www.grahamdoors.com.
   4. Marshfield DoorSystems, Inc: www.marshfielddoors.com.
   5. VT Architectural Wood Doors: www.vtindustries.com.
   6. Ipik Door Company; www.ipikdoor.com.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.3 DOORS

A. All Doors: See drawings for locations and additional requirements.
   1. Quality Level: Custom Grade, Standard Duty performance, in accordance with AWI/AWMAC/WI (AWS).
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at all locations.
   2. Wood veneer facing for field opaque finish .

2.4 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.
   1. Particleboard Core Doors:
      a. Particleboard: Wood fiber based materials complying with ANSI A208.1 Particleboard standard. Grade LD-2.
      b. Adhesive: Fully bonded construction using Polyurethane (PUR) glue.

c. Blocking: When through-bolted hardware is not used, provide wood blocking in particleboard core doors as follows:
   1) 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
   2) 5-inch (125-mm) mid-rail blocking, in doors indicated to have exit devices.
      (a) Optional Cores for Blocking: Provide doors with either glued-wood-stave or structural-composite-lumber core instead of particleboard core for doors indicated to receive closers and exit devices.

2.5 DOOR FACINGS

A. Veneer Facing for Opaque Finish: Medium density overlay (MDO).

B. Facing Adhesive: Type I - waterproof.

2.6 ACCESSORIES

A. Glazing: As specified in Section 08 8000.

B. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.
   1. Wood Beads for Light Openings in Wood Doors up to and including 20-minute rating.
   2. Profile: Manufacturer’s standard lipped profile. At wood core doors with 20-minute fire protection ratings, provide wood beads and metal glazing clips approved for such use.

2.7 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
   2. Provide solid blocking for other throughbolted hardware.

C. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.

D. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

E. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
   1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

F. Openings: Cut and trim openings through doors in factory.
   1. Light Openings: Trim openings with moldings of material and profile indicated.
   2. Glazing: Comply with applicable requirements in Division 08 Section "Glazing."

G. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   1. Exception: Doors to be field finished.

H. Provide edge clearances in accordance with the quality standard specified.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

D. Examine doors and installed door frames before hanging doors.
   1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
   2. Reject doors with defects.

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

3.2 INSTALLATION

A. Hardware: For installation, see Division 8 Section "Door Hardware."

B. Install doors in accordance with manufacturer's instructions and specified quality standard.

C. Field-Finished Doors: Trimming to fit is acceptable.
   1. Adjust width of non-rated doors by cutting equally on both jamb edges.
   2. Trim maximum of 3/4 inch (19 mm) off bottom edges.

D. Use machine tools to cut or drill for hardware.

E. Coordinate installation of doors with installation of frames and hardware.

F. Coordinate installation of glazing.

3.3 TOLERANCES

A. Conform to specified quality standard for fit and clearance tolerances.

B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.4 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

C. Operation: Re-hang or replace doors that do not swing or operate freely.

3.5 SCHEDULE - SEE DRAWINGS

END OF SECTION

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SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

1.3 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing: Steel attachment members.

B. Section 05 4000 - Cold-Formed Metal Framing.

C. Section 07 2500 - Weather Barriers: Sealing framing to weather barrier installed on adjacent construction.

D. Section 07 6200 - Sheet Metal Flashing and Trim.

E. Section 07 9005 - Joint Sealers.

F. Section 08 8000 - Glazing: Glass and glazing accessories.

1.4 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.

B. AAMA 612 - Voluntary Specification, Performance Requirements and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum; 2002.

C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; American Architectural Manufacturers Association; 2009.

D. AAMA 1801 - Voluntary Specification, Acoustical Rating of Windows, Doors, Skylights and Glazed Wall Sections; 2011.

E. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

F. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2011.

G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.

I. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

J. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.

K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.

L. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

M. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005(2011).

N. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

O. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.

P. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

Q. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Differential; 2000 (Reapproved 2009).

R. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2000 (Reapproved 2008).

S. ASTM E1425 - Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems; 2014.

T. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2014.

U. International Building Code (IBC); 2012.

V. Miami (APD) - Approved Products Directory; Miami-Dade County; database at www.miamidade.gov/development/product-control.asp.

W. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting ten (10) days before starting work of this section; require attendance by all affected installers.

1.6 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. General: The following submittal package shall be submitted as a complete package, including the following listed below. Individual submittals will be returned unaccepted until the complete package is submitted.

C. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details .
   1. For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for aluminum-framed systems.

D. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
   1. For aluminum-framed systems. Include plans, elevations, sections, details, and attachments to other work.
   2. Include details of provisions for system expansion and contraction, as required.
   3. For entrance doors, coordinate shop drawings with other work.

E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

F. Design Data: Provide framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

G. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

H. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

I. Fabrication Sample: For each vertical-to-horizontal intersection of aluminum-framed systems, provide isometric drawings showing details of the following:

1. Joinery, including concealed welds.
2. Anchorage.
3. Expansion provisions.
4. Glazing.

J. Report of field testing for water leakage.
   1. Quality Assurance/Control Submittals:
      a. Test reports: Submit certified test reports showing compliance with specified system performance characteristics.

K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.7 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at LOUISIANA.
   1. Engineering Responsibility: Prepare data for aluminum-framed systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.
      a. System design and associated design calculations are to be sealed and signed by Professional Structural Engineer licensed in the State of Louisiana responsible for overseeing design of system.
   2. Design aluminum storefront systems, including perimeter trims, stools, accessories, shims, anchors and perimeter sealing of storefront units capable of withstanding the design loads indicated on structural drawings.

B. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

C. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
   1. Acceptable to manufacturer and capable of preparation of data for aluminum-framed systems including Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

D. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

E. Do not revise intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If revisions are proposed, submit comprehensive explanatory data to Architect for review.

F. Single Source Responsibility: To ensure quality of appearance and performance, obtain materials for each system from either a single manufacturer or from manufacturer approved by each system manufacturer.
   1. Materials used for the scope of work in this section are to be by the same manufacturer selected for use in Section 08 4413 - Glazed Aluminum Curtain Walls.

G. Welding Qualifications: Qualify procedures and personnel according to AWS D1.2, "Structural Welding Code - Aluminum."

H. Pre-Installation Conference: Conduct conference at Project Site. Notify Architect minimum ten (10) days prior to the conference.
   1. Verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.
   2. Attendees are to include manufacturer's field representative and representatives for all contractors associated with the system and all contractors associated with adjacent materials and systems installed in proximity of the work.

I. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   1. Mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.
   2. Build mockup of typical wall area as approved by Architect.
   3. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standard for fabrication and installation.
   4. Field testing shall be performed on mockups according to requirements in “Field Quality Control” Article.
   5. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.9 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

B. Field Measurements: Verify actual locations of structural supports for aluminum-framed systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1.10 WARRANTY

A. See Division 01 for additional project warranty requirements.

B. Correct defective Work within a two (2) year period after Date of Substantial Completion.
   1. Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.
      a. Failures include, but are not limited to, the following:
         1) Structural failures including, but not limited to, excessive deflection.
         2) Noise or vibration caused by thermal movements.
         3) Deterioration of metals and other materials beyond normal wear.

C. Provide two (2) year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Provide ten (10) year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.
   1. Manufacturer’s standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.

E. At welded door corner construction, provide limited lifetime warranty for life of door under normal use.

PART 2 PRODUCTS

2.1 BASIS OF DESIGN -- FRAMING FOR MONOLITHIC GLAZING

A. Wind-Borne-Debris Resistance Tested:
   1. **Basis of Design**: Kawneer; IR 500 Series Framing Systems: www.kawneer.com..

B. Center-Set Style:
   1. Vertical Mullion Dimensions: 2-1/2 inches wide by 5 inches deep (64 mm wide by 127 mm deep).

C. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below:
   1. C.R. Laurence Co., Inc; U.S. Aluminum: www.crl-arch.com.
   2. YKK AP America Inc: www.ykkap.com.
   3. Southern Walls and Windows: www.sowalls.com.

D. Substitutions: See Section 01 6000 - Product Requirements.

1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

E. Equivalent systems by other manufacturers must equal or exceed the performance standards of the Basis of Design to the satisfaction of the Architect.

2.2 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Finish: Superior performing organic coatings.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
   2. Finish Color: As selected by Architect from manufacturer's standard line.
   3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
   5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
   6. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F (95 degrees C) over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
   7. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
   8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
   9. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
      a. Where applicable at exterior location(s).
   10. Preparation for Window Treatments: Provide reinforced interior horizontal head rail.

B. Performance Requirements:
   1. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
      a. Movements of supporting structure indicated on Drawings including, but not limited to deflection from uniformly distributed and concentrated live loads.
      b. Dimensional tolerances of building frame and other adjacent construction.
      c. Failure includes the following:

1) Deflection exceeding specified limits.
2) Thermal stresses transferring to building structure.
3) Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
4) Noise or vibration created by thermal and structural movements.
5) Loosening or weakening of fasteners, attachments, and other components.
6) Sealant failure.
7) Failure of operating units.

2. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
   a. Design Wind Loads: Comply with requirements of ASCE 7 and design pressures indicated on structural drawings.
   b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
3. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 12 lbf/sq ft (575 Pa).
4. Deflection of Framing Members Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches (4.1 m) and to 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.
5. Air Leakage: Maximum of 0.06 cu ft/min/sq ft (0.3 L/s/sq m) of wall area, when tested in accordance with ASTM E283 at 6.27 pounds per square foot (300 Pa) pressure differential across assembly.
6. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures.
   a. Temperature Change (Range): 32 deg F (0 deg C), ambient; 180 deg F (82.2 deg C), material surfaces.
7. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.
8. Sound Transmission: Provide aluminum-framed systems with fixed glazing and framing areas having the following sound-transmission characteristics:
   a. Sound Transmission Class (STC): Minimum 35 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.

2.3 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
   1. Framing members for interior applications need not be thermally broken.
   2. Glazing stops: Flush.

3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Glazing: As specified in Section 08 8000.

2.4 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209 (ASTM B209M).

C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

D. Structural Supporting Anchors: See Section 05 1200.

E. Provide strap anchors as indicated on drawings and as recommended by storefront manufacturer in accordance with structural design requirements for system. Refer to Section 05 4000 Cold-Formed Metal Framing.

F. Structural Supporting Anchors Attached to Structural Steel: Design for welded attachment.
   1. Refer to structural documents.

G. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for welded attachment to weld plates embedded in concrete.

H. Fasteners: Stainless steel.

I. Exposed Flashings: Aluminum sheet, 20 gage, 0.032 inch (0.81 mm) minimum thickness; finish to match framing members.

J. Concealed Flashings: Sheet aluminum, 25 gage, 0.018 inch (0.5 mm) minimum thickness.

K. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, compatible with flashing material.
   1. As recommended by manufacturer.

L. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
   1. Comply with ASTM C864 and be extruded of a silicone compatible EPDM rubber that provides for silicone adhesion.

M. Glazing Accessories: As specified in Section 08 8000.

N. Shop and Touch-Up Primer for Steel Components: Zinc oxide, alkyd, linseed oil primer appropriate for use over hand cleaned steel.

O. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

P. Bituminous Paint: Cold applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30 mil (0.03 inch (0.762 mm).

2.5 FINISHES

A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.

B. Color: As selected by Architect from manufacturer's full range.

C. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify dimensions, tolerances, and method of attachment with other work.

C. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

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

3.2 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.
   1. Do not install damaged components.
   2. Fit joints to produce hairline joints free of burrs and distortion.
   3. Rigidly secure non-movement joints.
   4. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration.
   5. Seal joints watertight, unless otherwise indicated.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
   1. Metal Protection:
      a. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings (where applicable). Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Install glass and infill panels in accordance with Section 08 8000, using glazing method required to achieve performance criteria.

J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.3 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft (1.5 mm/m) non-cumulative or 1/16 inches per 10 ft (1.5 mm/3 m), whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

C. Diagonal Measurements: Limit difference between diagonal measurement to 1/8 inch (3 mm).

3.4 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.

B. Contractor to provide independent AAMA certified testing services for storefront installation.

C. Field Tests: Test installed fixed storefront for air leakage and water resistance in accordance with the latest version of AAMA 503 as recognized by the authority having jurisdiction.
   1. Architect shall select [three] fixed storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter sealed and cured.
      a. One unit will be randomly selected by the Architect at each testing period which will occur at 10%, 50% and 75% of the completed system installation.
   2. Tests will be performed at a minimum pressure differential of 8 psf.
   3. Three successful tests must be completed prior to acceptance.

D. Repair or remove work where inspections indicate that it does not comply with specified requirements.

E. Additional inspection, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

F. Aluminum-framed assemblies will be considered defective if they do not pass inspections.

G. Prepare inspection reports and provide to Architect for review.

3.5 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

C. Remove excess sealant by method acceptable to sealant manufacturer.

3.6 PROTECTION

A. Protect installed products from damage during subsequent construction.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. The work in this section shall include the furnishing of all items of finish hardware as hereinafter specified, or obviously necessary to complete the building, except those items which are specifically excluded from this section of the specification.

B. Hardware for wood doors.

C. Hardware for fire-rated doors.

D. Lock cylinders for doors for which hardware is specified in other sections.

E. Thresholds.

F. Weatherstripping, seals and door gaskets.

1.3 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 1416 - Flush Wood Doors.

C. Section 08 4313 - Aluminum-Framed Storefronts: Hardware for doors in storefronts and Curtain walls including:
   1. Integral weatherstripping.
   2. Sill sweep strip.

1.4 REFERENCES

A. ANSI/BHMA (Builders Hardware Manufacturers Association) – A156 series

B. NFPA 80 (National Fire Protection Association) – Fire Doors and Windows 2013

C. NFPA 252 (National Fire Protection Association) – Fire Tests of Door Assemblies.

D. UL 10B (Underwriters Laboratories, Inc.) – Safety Fire Tests of Door Assemblies

E. UL 305 (Underwriters Laboratories, Inc.) – Safety Panic Hardware

F. UL (Underwriters Laboratories, Inc.) – Building Materials Directory current edition

G. WH (Warnock Hersey) – Directory of Listed Projects

H. NFPA 101 (National Fire Protection Association) – Life Safety Code 2012

I. IBC (International Building Code) 2012

J. ADA Standards – (American with Disabilities Act) 2010

1.5 PERFORMANCE REQUIREMENTS

A. Fire Rated Openings: Provide door hardware listed by UL or Warnock Hersey, or other Testing laboratory approved by applicable authorities.
   1. Hardware: Tested in accordance with NFPA 252

1.6 SUBMITTALS

A. See Section 01 3300 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate locations and mounting heights of each type of hardware, schedules, Catalog cuts, electrical characteristics and connection requirements.
   2. Submit manufacturer's parts list and templates.

C. SAMPLES
   1. If requested, submit one sample of typical hinge, latchset, lockset and closer, illustrating Style, color, and finish.

1.7 CLOSEOUT SUBMITTALS

A. Section 01 7700 – Execution Requirements: Closeout procedures.

B. Project Record Documents: Keying schedule with locations of installed cylinders and their master key code.

C. Operation and Maintenance Data. Submit data on operating hardware, lubrication requirements and inspection procedures related to preventative maintenance.

D. Keys: Deliver with identifying tags to owner by security shipment, direct from Hardware Supplier.

1.8 QUALITY ASSURANCE

A. Perform Work in accordance with the following requirements:
   1. ANSI/BGNA A156 Series
   2. NFPA 80
   3. NFPA 101
   4. UL 305

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Hardware Supplier: A recognized Architectural Finish Hardware Supplier, with warehousing Facilities, who has been furnishing hardware in project's vicinity for a period of 2 years, and who is, or who employs and experienced Architectural Hardware Consultant (AHC), who is available at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor. Supplier is responsible for proper coordination of all finished hardware with related sections to insure compatibility of products.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Section 01 6000 – Product Requirements: Product storage and handling requirements.

B. Package hardware items individually with necessary fasteners, instructions, and installation Templates, when necessary; label and identify each package with door opening code to match hardware schedule.

C. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control Handling and installation of hardware items which are not immediately replaceable, so that completion of work will not be delayed by hardware losses , both before and after installation.

1.11 COORDINATION

A. Section 01 3100 – Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
   1. Provide templates or actual hardware as required to ensure proper preparation of Doors and frames.

C. Coordinate Owner's keying requirements during course of work.

1.12 WARRANTY

A. Section 01 7800 – Execution requirements: Product warranties and product bonds.

B. Special warranties:
   1. Door Closers: Ten year period.
   2. Exit Devices: Three year period.
   3. Locks and Cylinders: Three year period.

1.13 MAINTENANCE MATERIALS

A. Section 01 7700 – Execution Requirements: Maintenance materials.

B. Furnish special wrenches and tools applicable for each different and for each special Hardware component.

PART 2 PRODUCTS

2.1 DOOR HARDWARE

A. Product numbers listed in schedule are from the following manufacturers.
1. Ives (IVE)
2. Schlage (SCH)
3. LCN (LCN)
4. Von Duprin (VON)
5. Glynn Johnson (GLY)
6. National Guard (NAT)

B. Hinge Manufacturers:

1. Bommer	BB5000	BB5002	FM83SLF-HD
2. Hager	BB1279	BB1191	780-112HD
3. Ives*	5BB1	5BB1	112HD
4. Stanley	FBB179	FBB191	661HD

C. Lockset, Latch Set and Cylinder Manufacturers:

1. Schlage*	L Series	Trim to match existing
2. Sargent	8200 Series	Trim to match existing

D. Exit Device Manufacturers:
1. Von Duprin* 98 Series
2. Sargent 19-80 Series

E. Closer Manufacturers:
1. LCN* 4010/4110 Series and 1461 Series
2. Sargent 251 Series

F. Overhead Stop and Holder Manufacturers: As listed in hardware sets
1. Glynn Johnson *
2. Rixson

G. Door Stop Manufacturers: As listed in hardware sets
1. Ives*
2. Rockwood
3. Trimco

H. Push/Pulls, Flush Bolts, Kickplates: as listed in hardware sets
1. Ives*
2. Rockwood
3. Trimco

I. Threshold and Weatherstripping Manufacturers
1. National Guard*

2. Pemko
3. Zero

2.2 COMPONENTS

A. General Hardware Requirements: Where not specifically indicated, comply with applicable ANSI A156 standard for type of hardware required. Furnish each type of hardware with Accessories as required for applications indicated and for complete, finished, operational doors.
   1. All hardware finishes to match existing.
   2. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in work.
   3. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by Hardware Supplier or Hardware Manufacturer.
   4. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.
      a. Finish: Match hardware item being fastened.
   5. Fire Ratings: Provide hardware in compliance with NFPA 80 Hardware, UL or Warnock Hersey compliant for given type/size opening and degree of label. Provide proper latching hardware, door closers, approved-bearing hinges and seals whether listed in hardware schedule.

B. Hinges: ANSI A156.1 full mortise type complying with following general requirements unless otherwise schedules.
   1. Widths: Sufficient to clear trim projection when door swings 180 degrees.
   2. Number: Furnish three hinges per leaf to 90 inches. Add one hinge for each additional 30 inches or fraction thereof.
      a. Fire Rated Doors to 86 inches high: Furnish three hinges.
   3. Size and Weight: 4-1/2 inch standard weight typical for 1-3/4 inch doors unless otherwise specified.
      a. Doors over 40 inches wide: Heavy weight 5” hinges.
      b. Doors 2 inch thick: 5 inch heavy weight.
   4. Pins: Furnish nonferrous hinges with non-removable pins (NRP) as exterior and steel (NRP) hinges at interior locked out-swinging doors, non-rising pins at interior doors.
   5. Tips: Flat button tips with matching plug.

C. Mortise Locksets and Latchsets: as scheduled
   1. Chassis: cold-rolled steel, handing field-changeable without disassembly.
   2. Lachbolts: 3/4 –inch throw stainless steel anti-friction type.
   3. Lever Trim: through-bolted, accessible design, cast or solid rod lever as scheduled.
   4. Spindles: independent break-away.
   5. Thumbturns: accessible design not requiring pinching or twisting motions to operate.
   6. Deadbolts: stainless steel 1-inch throw.
   7. Strikes: 16 gage curved stainless steel, bronze or brass with 1" deep box construction, lips of sufficient length to clear trim and protect clothing.
   8. Lock Series and Design: Schlage L Series Match existing trim

9. Certifications:
   a. ANSI A156.13, Series 1000, Grade 1 Operation, Grade 1 Security
   b. ANSI/ASTM F476-84 Grade 30 UL Listed

D. Cylinders and Keying:
   1. Standard System: Locks to be Keyed to the existing Edgard Library Key System.
   2. Review the keying system with the owner and provide the type required (master, grandmaster, great-grandmaster), integrated with Owner's existing system.
   3. Comply with Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock that is not designated to be keyed alike with group of related locks.
      a. Permanently inscribe each key with number of lock that identifies cylinder manufacturer's key symbol, and notation, "DO NOT DUPLICATE".
   4. Key Materials: Provide keys of nickel silver only.
   5. Key Quantity: Furnish 3 change keys for each lock, 5 master keys for each master system, 5 grandmaster keys for each grandmaster system, 3 Control Keys, 5 Construction Master Keys and 3 Construction control keys

E. Exit Devices:
   1. Characteristics:
      a. Exit devices shall be "UL" listed for life safety. All exit devices for fire rated openings shall have "UL" labels for "Fire Exit Hardware."
      b. All exit devices mounted on labeled wood doors shall be mounted on the door per the door manufacturer's requirements.
      c. All trim shall be thru-bolted to the lock stile case. Lever design to match locksets.
      d. All exit devices shall be made of brass, bronze, stainless steel, or aluminum material, powder coated, anodized, or plated to the standard architectural finishes to match the balance of the door hardware.
      e. Provide glass bead conversion kits to shim exit devices on doors with raised glass heads.
      f. All exit devices shall be one manufacturer. No deviation will be considered.
      g. All series exit devices shall incorporate a fluid damper, which decelerates the touchpad on its return stroke and eliminates noise associated with exit device operation. All exit devices shall be non-handed. Touchpad shall extend a minimum of 1/2 of the door width and shall extend to the height of the cross rail housing for a "no pinch" operation. Plastic touchpads are not acceptable. All latchbolts to be the deadlocking type.
      h. Lever trim shall be solid case material with a break-away feature to limit damage to the unit from vandalism.
      i. Surface vertical rod devices shall be UL labeled for fire door applications without the use of bottom rod assemblies. Where bottom rods are required for security applications, the devices shall be UL labeled for fire doors applications with rod and latch guards by the device manufacturer.

F. Closers and Door Control Devices:

1. Characteristics:
   a. Door closers shall have fully hydraulic, full rack and pinion action.
   b. All closers shall utilize a stable fluid withstanding temperature range of 120oF to-30oF without seasonal adjustment of closer speed to properly close the door. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with standards UBC 7-2 (1997) and UL 10C
   c. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped. Spring power adjustment (LCN Fast ™ Power Adjust) allows for quick and accurate power adjustment and visually shows closer power size settings by way of dial adjustment gauge located on closer spring tube. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed and back check.
   d. All closers shall have solid forged steel main arms (and forearms for parallel arm closers) and where specified shall have a cast-in solid stop on the closer shoe ("CNS"). Where door travel on out-swing doors must be limited, use "CNS" or "S-CNS" type closers. Auxiliary stops are not required when cush type closers are used.
   e. Overhead concealed closers shall have spring power adjustable for 50% increase in closing power and fully mortised door tracks.
   f. All closers (overhead, surface and concealed) shall be of one manufacturer and carry manufacturer's ten year warranty.
   g. Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped provide adjustable units complying with ADA and ANSI A-117.1 provisions for door opening force.
   h. Closers to be installed to allow door swing as shown on plans. Doors swinging into exit corridors shall provide for corridor clear width as required by code. Where possible, mount closers inside rooms.
   i. Powder coating finish to be certified to exceed 100 hours salt spray testing by ETL, an independent testing laboratory used by BHMA for ANSI certification.

G. Door Controls and Overhead Holders: Furnish with accessories as required for complete Operational installation.
   1. Manual door holders and overhead stops: ANSI/BHMA A156.8 Grade 1; types as listed in schedule.

H. Push/Pulls, Manual Flush Bolts, Protection Plates and Trim: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.
   1. Push/Pull: ANSI/BHMA A156.6; push plates minimum .050 inch thick. Furnish Pull plates with straight pulls with bolts to secure from opposite door face.
   2. Push/Pull Sets: Furnish pulls and push/pull sets with offset pulls.
   3. Manual Flush Bolts: ANSI/BHMA A156.16 Grade 1 top and bottom flush bolts with Dust-proof strike, unless otherwise indicated.
   4. Kickplates: ANSI/BHMA A156.6 metal; height indicated in Schedule; .050 thick Stainless Steel.

5. Wall Stops: ANSI/BHMA A156.1 Grade 1; convex wall stop with no exposed screws as Listed in schedule.
6. Floor Stops: ANSI/BHMA A156.1 Grade 1; furnish as listed in schedule.

I. Thresholds, Weatherstripping
1. Weatherstripping: Furnish continuous weatherstripping at top and sides of Exterior doors.
2. Thresholds: Furnish thresholds as listed.

2.3 ACCESSORIES

A. Lock Trim: Furnish levers with rose as indicated in Schedule.

B. Through Bolts: Furnish thru bolts for door closers on fire rated doors.

2.4 FINISHES

A. Finishes: ANSI/BHMA A156.18; furnish the following finished except where otherwise indicated.
1. **ALL FINISHES TO MATCH EXISTING**.
2. Hinges.
   a. BHMA 630 (Satin Stainless Steel) exterior hinges, and as specified.
   b. BHMA 626 or 652 (Satin Chrome) Interior Hinges.
3. Locks, exit devices, stops.
   a. BHMA 626 (Satin Chrome).
4. Kickplates, push/pull plates, push/pull sets.
   a. BHMA 630 (Satin Stainless Steel).
5. Door Closers.
   a. Aluminum powder coat finish to match hardware.
6. Thresholds, weatherstripping.
   a. BHMA 628 (Satin Aluminum).
7. Other Items: Furnish manufacturer's standard finishes to match similar hardware types.
   a. On the same door, and maintain acceptable finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 3100 – Administrative Requirements: Coordination and project conditions.

B. Verify electric power is available to power operated devices and is of correct characteristics.

3.2 INSTALLATION

A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware For Standard Steel Doors and Frames" by the Door and Hardware Institute,

except as specifically indicated or required to comply with governing regulations, and except as may be otherwise Directed by Architect.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 Sections. Do not install surface-mount items until finished have been complete on the substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

3.3 ADJUSTING

A. Section 01 7700 – Execution Requirements; testing and balancing

B. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

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 final check and adjustment of all hardware items in such space or area. Clean 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 finishes, during the final adjustment of hardware.

3.4 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 01 7700 – Execution Requirements: Protecting installed construction.

B. Do not permit adjacent work to damage hardware or hardware finish.

3.5 SCHEDULES

Heading: 01

Marks:
101

Each Opening To Have:

1	CONTINUOUS HINGE	112HD	628	IVE
1	EXIT DEVICE	98NL x 990-NL	626	VON
1	RIM CYLINDER	KEYED TO EXISTING SYSTEM	626	
1	CLOSER	4111 X CUSH	AL	LCN
1	THRESHOLD	896N	628	NAT
1	GASKETING	160AS	628	NAT
1	OVERHEAD DROP	16A	628	NAT
1	DOOR SWEEP	200NA	628	NAT

Heading: 02

Marks:
102, 103

Each Opening To Have:

3	HINGES	5BB1	652	IVE
1	PASSAGE SET	L9010	626	SCH
1	WALL STOP	WS407CVX	630	IVE
3	DOOR SILENCERS	SR64	GRY	IVE

Heading: 03

Marks:
105

Each Opening To Have:

3	HINGES	5BB1	652	IVE
1	OFFICE LOCK	L9050	626	SCH
1	MORTISE CYLINDER	KEYED TO SYSTEM	626	
1	CLOSER	1461	AL	LCN
1	FLOOR STOP	FS439	626	IVE
3	DOOR SILENCERS	SR64	GRY	IVE

End of Section

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Glass.

B. Glazing compounds and accessories.

1.3 RELATED REQUIREMENTS

A. Section 07 9005 - Joint Sealers.

B. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.

C. Section 08 4313 - Aluminum-Framed Storefronts.

1.4 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

C. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.

D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

E. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2014.

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

G. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.

H. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems by Windborne Debris in Hurricanes; 2014a.

I. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2009.

J. GANA (GM) - GANA Laminated Glazing Manual; Glass Association of North America; 2009.

K. GANA (SM) - GANA Sealant Manual; Glass Association of North America; 2008.

L. GANA (LGDG) - Laminated Glazing Reference Manual; Glass Association of North America; 2009.

M. ICC (IBC) - International Building Code; 2012.

1.5 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

C. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.

D. Deterioration of Insulating Glass: Failure of hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

E. Deterioration of Coated Glass: Defects developed from normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.

F. Deterioration of Laminated Glass: Defects developed from normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1.6 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Design Loads for glazing system, components and cladding wind loads determined in accordance with ASTM E 1996, for the parameters specified.
   1. Design Loads: Refer to structural drawings.

2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.
3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

C. Glass Design: Glass thickness designations indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites in the thickness designations indicated for various size openings, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
   1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
      a. Specified Design Wind Loads: As indicated on structural drawings, but not less than wind loads applicable to Project as required by ASCE 7 "Minimum Design Loads for Buildings and Other Structures": Section 6.0 "Wind Loads."
      b. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.
      c. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow action.
      d. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
      e. Windborne-Debris-Impact-Resistance-Test Performance: Provide glazing for aluminum-framed systems that pass large and small missile-impact tests and cyclic-pressure tests according to the requirements of The International Building Code.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

E. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
   1. For monolithic-glass lites, properties are based on units with lites 6.0 mm thick.
   2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite 6.0 mm thick and a nominal 1/2-inch- (12.7-mm) wide interspace.
   3. For laminated-glass lites, properties are based on products of construction indicated.

F. Impact Resistance: System to meet requirements for coastal hurricane missile impact loads.
   1. Glazed aluminum curtain wall up to 30 feet above grade shall be designed for Large Missile Impact (LMI) in accordance with ASTM E1996.
   2. Glazed aluminum curtain wall frame 30 feet to 60 feet above grade shall be designed for Small Missile Impact (SMI) in accordance with ASTM E1996.

1.7 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.
   1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Review temporary protection requirements for glazing during and after installation.

1.8 SUBMITTALS

A. See Section 01-3300 - Submittal Procedures.

B. General: The following submittal package shall be submitted as a complete package, including the following listed below. Individual submittals will be returned unaccepted until the complete package is submitted.

C. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

D. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

E. Samples: Submit two samples 12 by 12 inch (305 by 305 mm) in size of glass and plastic units, showing coloration and designof glass units, showing coloration and design.

F. Glazing Schedule: Use same designations indicated on Drawings.

G. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer.

H. Manufacturer's Certificates: Certify that products meet or exceed specified requirements.
   1. Tinted/coated float glass.
   2. Glazing sealants.

I. Manufacturer's Certificate: Certify that sealed insulated glass meets or exceeds specified requirements.

J. Warranties: Sample of special warranties.

1.9 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual, GANA Sealant Manual, and GANA Laminated Glazing Reference Manual for glazing installation methods. Maintain one copy on site.

B. Manufacturer/Fabricator Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer. Manufacturer/Fabricator to provide references and submit project experience documentation demonstrating that they have successfully completed not less than five (5) projects of similar scope that have incorporated high-performance, low-e coated glass products,with a record of successful in-service performance.

C. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.
   1. An experienced installer who has completed glazing similar in material, design and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association's Program.

D. Source Limitations for Glass: Obtain tinted float glass, laminated glass and insulating glass from single source from single manufacturer for each glass type.

E. Glass Distortion Standard for heat-treated glass sized 6.0 mm or thicker:
   1. Distortion Tolerance: Roll wave peak-to-valley (PV) not to exceed .003 center/.008 edges.
   2. Millidiopter: 90 percent of surface not to exceed +/- 120 millidiopters.
   3. Monitoring: Every lite measured with an on-line distortion measurement system.
   4. Bow/Warp Tolerance: Maximum tolerance for bow/warp is 1/2 of ASTM C1048.
   5. Measure glass lites for optical distortion by on-line distortion measurement system. All documentation shall be recorded and available to the Architect upon request.

F. Color Quality Standards:
   1. Manufacturing Facilities
      a. Manufacturer will employ stringent quality control procedures to ensure the coated glass delivered to their certified network of glazing system fabricators is of the highest standard.
      b. These procedures will include the use of both on-line continuous color measurements as well as regular quality control checks using off-line measurement instrumentation.
      c. Tolerances for color variation will be less than as prescribed in ASTM C1376.
   2. Certified Fabricators
      a. Color measurements will be preformed to ensure compliance to ASTM C1376 and will be conducted in accordance with the fabricator's documented quality control procedure.

G. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing according to ASTM C1087, samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants and provide results to the Architect for review.

H. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.
   1. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.

I. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1. GANA Publications: GANA Laminated Division's "Laminated Glazing Reference Manual" and GANA's "Glazing Manual".

1.10 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for additional mock-up requirements.

B. Provide mock-up of installed window systems including glass and air barrier and vapor retarder seal.
   1. Build mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   2. Install glazing in mock-ups specified in Division 08 "Alumiinum-Framed Storefronts" and Division 08 "Glazed Aluminum Curtain Walls" to match glazing systems required for Project, including glazing methods.

C. Locate where directed by Architect.

D. Mock-up may remain as part of the Work if undisturbed at time of Substantial Completion.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.12 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

B. Do not install glazing when ambient temperature is less than 50 degrees F (10 degrees C).

C. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.13 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.
   1. Refer to "Definitions" in this specification section.
   2. Warranty period begins from the date of Substantial Completion.

C. Coated-Glass Products: Provide a ten (10) year warranty to include coverage for deterioration, including replacement of failed units.
   1. Refer to "Definitions" in this specifiction section.
   2. Warranty perid begins from the date of Substantial completion.

PART 2 PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
   1. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
   2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

C. Windborne-Debris-Impact Resistance: Provide exterior glazing that passes enhanced-protection testing requirements in ASTM E 1996 for Wind Zone 3 when tested according to ASTM E 1886. Test specimens shall be no smaller in width and length than glazing indicated for use on the Project and shall be installed in same manner as glazing indicated for use on the Project.
   1. Large-Missile Test: For glazing located within 30 feet (9.1 m) of grade.
   2. Small-Missile Test: For glazing located more than 30 feet (9.1 m) above grade.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
   1. For monolithic-glass lites, properties are based on units with lites 6.0 mm thick.

2. For laminated-glass lites, properties are based on products of construction indicated.
3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 GLAZING UNITS

A. Type GL-1 - Monolithic Glazing Units: Impact Resistant.
   1. Application: Provide this type of glazing in the following locations:
      a. Glazed lites in new exterior storefront windows.
   2. Type: Monolithic, impact-resistant. Use fully tempered float glass for both outboard and inboard lites.
   3. Tint: To match existing exterior storefront glazing.
      a. Coordinate with Architect.
   4. Thickness: 9/16 inch (14 mm).

B. Type GL-2 - Single Safety Glazing: Non-fire-rated.
   1. Application: Provide this type of glazing in the following locations:
      a. Glazed lites in doors.
         1) As scheduled, unless indicated otherwise.
   2. Type: Fully tempered float glass as specified.
   3. Tint: Clear.
   4. Thickness: 1/4 inch (6 mm).
   5. Light Transmittance: 89 percent, nominal.
   6. Solar Heat Gain Coefficient: 0.81 percent, nominal.
   7. Glazing Method: Interior dry method, tape and tape.

2.3 EXTERIOR GLAZING ASSEMBLIES

A. Performance Criteria: Select type and thickness of glass to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Design Pressure: As indicated on Structural Drawings.
   2. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
   3. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
   4. Glass thicknesses listed are minimum.

B. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
   1. In conjunction with vapor retarder and joint sealer materials described in other sections.
   2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.

3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.

2.4 GLASS MATERIALS

A. Fabricators:
   1. Trulite Glass and Aluminum Solutions: www.trulite.com.
   2. Viracon, Inc: www.viracon.com.
   3. Substitutions: Refer to Section 01 6000 - Product Requirements.

B. Float Glass Manufacturers:
   1. AGC Glass Company North America, Inc: www.us.agc.com.
   2. Guardian Industries Corp: www.sunguardglass.com.
   3. PPG Industries, Inc: www.ppgideascapes.com. **BASIS OF DESIGN.**
   4. Substitutions: Refer to Section 01 6000 - Product Requirements.

C. Float Glass: Provide float glass based glazing unless noted otherwise.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
   2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and Kind FT.
      a. Tong marks are permitted if concealed in glazing channel.
   3. Tinted Types: ASTM C1036, Class 2 - Tinted, color and performance characteristics as indicated.
   4. Thicknesses: As indicated; for exterior glazing comply with requirements indicated for wind load design regardless of thickness indicated.

D. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
   1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
   2. Plastic Interlayer: 0.090 inch (2.29 mm) thick, minimum, or as required to meet code.
      a. Polyvinyl Butyral (PVB) Interlayer: 0.090 inch (2.286 mm) thick, minimum.
      b. Interlayer Color: Clear unless otherwise indicated.
   3. Where fully tempered is specified or required, provide glass that has been tempered by the tong-less horizontal method.
      a. Tong method is acceptable if tong marks are concealed in glazing channel.
   4. Manufacturers:
      a. Cardinal Glass Industries: www.cardinalcorp.com.
      b. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com.
      c. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.5 GLAZING COMPOUNDS

A. Manufacturers:
   1. Bostik Inc: www.bostik-us.com.
   2. Pecora Corporation: www.pecora.com.
   3. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.

4. Substitutions: Refer to Section 01 6000 - Product Requirements.

B. Glazing compounds identified in this section are specific to the installation of glazing within storefront, curtain wall, door and window systems. These materials are not to come in contact with any adjacent building materials other than those immediate to the glazing installation.

C. Butyl Sealant: Single component; ASTM C920, Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

D. Silicone Sealant : Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; color as selected by Architect from manufacturer's full range.

2.6 GLAZING ACCESSORIES

A. Setting Blocks: EPDM, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.

B. Spacer Shims: EPDM, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch (75 mm) long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; hardness range of 5 to 30 cured Shore A durometer; coiled on release paper; black color.
   1. Width: As required for application.
   2. Thickness: As required for application.
   3. Spacer Rod Diameter: As required for application.
   4. Manufacturers:
      a. Pecora Corporation: www.pecora.com.
      b. Tremco Global Sealants: www.tremcosealants.com.
      c. Dow Corning Corp.: www.dowcorning.com.
      d. Substitutions: As recommended by glazing manufacturer.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; black color.

E. Glazing Clips: Manufacturer's standard type.

2.7 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.2 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install manufacturer recommended sealants and glazing compounds per manufacturer recommendations and industry standards for each type of application.

E. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.

F. Install sealants in accordance with manufacturer's instructions.

3.3 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

A. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.

B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.

C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.4 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)

A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.

C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.

D. Place glazing tape on free perimeter of glazing in same manner described above.

E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

F. Knife trim protruding tape.

3.5 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

A. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.

B. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.

C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.

D. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch (610 mm) intervals, 1/4 inch (6 mm) below sight line.

E. Fill gaps between pane and applied stop with manufacturer recommended silicone type sealant to depth equal to bite on glazing, to uniform and level line.

F. Trim protruding tape edge.

3.6 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

C. Monitor and report installation procedures and unacceptable conditions.

3.7 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.8 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION

DIVISION 9

FINISHES

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SECTION 09 0561
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. This section applies to all floors identified in the contract documents as to receive the following types of floor coverings:
   1. Resilient tile and sheet.
   2. Carpet tile.
   3. Thin-set porcelain tile.

B. Preparation of new concrete floor slabs for installation of floor coverings.

C. Testing of concrete floor slabs for moisture and alkalinity (pH).

D. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.

1.3 RELATED REQUIREMENTS

A. Section 01 4000 - Quality Requirements: Additional requirements relating to testing agencies and testing.

B. Section 03 3000 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

C. Section 03 5400 - Cast Underlayment: Self-leveling underlayment applied as remediation treatment.

1.4 REFERENCES

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2014).

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2011.

E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2011.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.6 SUBMITTALS

A. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

B. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Include certification of accuracy by authorized official of testing agency.
   7. Submit report to Architect.
   8. Submit report not more than two business days after conclusion of testing.

C. Adhesive Bond and Compatibility Test Report.

D. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
   1. Manufacturer's qualification statement.
   2. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
   3. Manufacturer's installation instructions.
   4. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

1.7 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.

1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
2. Acceptable Testing Agencies:
   a. As selected from Owner's approved list..

C. Contractor's Responsibility Relating to Independent Agency Testing:
1. Provide access for and cooperate with testing agency.
2. Confirm date of start of testing at least 10 days prior to actual start.
3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.
5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

D. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.9 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F (18 degrees C) or more than 85 degrees F (30 degrees C).

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.1 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.

3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
   1. Thickness: 1/8 inch (3.2 mm), maximum.
   2. If testing agency recommends any particular products, use one of those.
   3. Products:
      a. ARDEX Engineered Cements; ARDEX MC ULTRA with ARDEX FEATHERFINISH: www.ardexamericas.com.
      b. Advanced Moisture Control, Inc.; Vapor-Green FC: www.vaporsafe.com.
      c. Concrete Curative Systems; CCS-SI: www.concretecurative.com.
      d. Synthetics International; Synthetics 30: www.syntheticsintl.com
      e. Substitutions: See Section 01 6300 - Product Substitution Procedures.
   4. Moisture Sealer (if required): Provide a synthetic polymer formulation made specifically for concrete moisture and alkalinity control applications where slab surfaces are intended to receive floor covering.
   5. The moisture sealer shall penetrate and seal concrete substrate to bring vapor emission and relative humidity into compliance for the safe installation of the floor covering specified.
   6. Approximate Spread Rates: 100 to 200 square feet per gallon, depending on the moisture levels.
   7. Performance:
      a. ASTM E 96: Water Vapor Transmission Rate from 80 to 99.5 percent reduction capability.
      b. ASTM D 1308: Acid/Alkali Resistance: 14 pH.
      c. ASTM F 2170: Relative Humidity Test (In-situ) resistant to 100 percent RH.
      d. VOC: 70 g/L or less.
   8. INSTALLATION MATERIALS
      a. Concrete Substrate Testing Equipment:
         1) Manufacturers of Equipment:
            (a) Wagner Electronics.
            (b) VAPRECISION
            (c) American Moisture Test
         2) Testing equipment Required:
            (a) Provide Rapid RH 4.0 meter to test the relative humidity and temperature in the concrete substrate as required by the flooring manufacturer and as specified in Part 3.

(b) Provide Anhydrous Calcium Chloride test to determine the Concrete Moisture Vapor Emission Rate (MVER) in the concrete substrate as required by the flooring manufacturer and as specified in Part 3.

PART 3 EXECUTION

3.1 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.

B. Perform following operations in the order indicated:
   1. Preliminary cleaning.
   2. Moisture vapor emission tests; 3 tests in the first 1000 square feet (100 square meters) and one test in each additional 1000 square feet (100 square meters), unless otherwise indicated or required by flooring manufacturer.
   3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   5. Specified remediation, if required.
   6. Patching, smoothing, and leveling, as required.
   7. Other preparation specified.
   8. Adhesive bond and compatibility test.
   9. Protection.

C. Remediations:
   1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
   2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating over entire suspect floor area.
   3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.2 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.3 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.4 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet (1.4 kg per 93 square meters) per 24 hours.

F. Report: Report the information required by the test method.

3.5 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.6 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

C. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.

D. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch (25 mm) in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.7 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with recommendations of testing agency.

C. Comply with requirements and recommendations of floor covering manufacturer.

D. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

E. Do not fill expansion joints, isolation joints, or other moving joints.

3.8 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.9 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.10 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

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SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Metal channel ceiling framing.
   1. Interior.

D. Gypsum sheathing.

E. Gypsum wallboard for walls, ceilings, and soffits.

F. Gypsum wallboard trim and accessories.

G. Joint treatment and accessories.

1.3 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 04 2000 - Unit Masonry: Thin Brick installation at interior partitions.

C. Section 05 4000 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.

D. Section 07 2100 - Thermal Insulation: Acoustic insulation.

E. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.

F. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire rated walls.

G. Section 09 9000 - Painting and Coating.

1.4 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.

B. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

D. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2012.

E. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.

F. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.

G. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.

H. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

I. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012.

J. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2011.

K. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

L. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2014a.

M. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.

N. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing; 2013.

O. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

P. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

Q. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.

R. ASTM E413 - Classification for Rating Sound Insulation; 2010.

S. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2013.

T. GA-600 - Fire Resistance Design Manual; Gypsum Association; 2012.

U. ICC (IBC) - International Building Code; 2012.

1.5 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

E. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 5 years of documented experience.

B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. All metal framing materials are to be sole sourced from a single manufacturer.

D. All board materials are to be sole sourced from a single manufacturer.

E. Apply acoustical sealant in accordance with applicable requirements of ASTM C919 at all openings and as shown on partition types.

1.7 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written instructions, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, and mold damaged.
   1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
   2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.
   1. See PART 3 for finishing requirements.

B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.2 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Clarkwestern Dietrich Building Systems LLC; ProSTUD- 33 mil: www.clarkdietrich.com.
   2. Marino; Viper Stud- 33 mil: www.marinoware.com.
   3. Super Stud Building Products, Inc.; DW 33- 35 mil: www.buysuperstud.com.
   4. Substitutions: See Section 01 6300 - Product Substitution Procedures.

B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (240 Pa).
   1. Framing Members:
      a. Studs: "C" shaped with flat or formed webs with knurled faces.
         1) flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch wide minimum lip (return).
      b. Runners: U shaped, sized to match studs.
      c. Minimum Thickness of base metal (uncoated) metal and depth:
         1) Nominal 20 gage (33 mil) minimum unless otherwise indicated on drawings.
         2) Nominal 16 gage minimum at interior partitions with thin brick veneer unless otherwise indicated on drawings. See Section 05 4000 - Cold-Formed Metal Framing.
         3) Nominal 16 gage minimum at door jambs (two studs at each jamb). See Section 05 4000 - Cold-Formed Metal Framing.
         4) Depth: As indicated on drawings.
      d. Protective Coating: ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized, unless otherwise indicated.
   2. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated complying with ASTM A 653, length and width as indicated, and with a minimum base metal (uncoated) thickness as follows:

a. Thickness: 0.027-inch unless otherwise indicated or otherwise required by manufacturer of items being installed.

3. Cold-Rolled Channel Bridging: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.
   a. Depth: 1-1/2 inches (38.1 mm).
   b. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38.1 by 38.1 mm), 0.068-inch- (1.73-mm-) thick, galvanized steel.
4. Suspension System Components:
   a. Ceiling Channels: C-shaped.
      1) Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0598 inch (1.5 mm) and minimum 7/16-inch- (11.1-mm-) wide flanges, with ASTM A 653, G60 hot-dip galvanized coating:
         (a) Carrying Channels: 1-1/2 inches (38 mm) deep, unless otherwise indicated.
         (b) Furring Channels: 3/4-inch deep, unless otherwise indicated.
      2) Tie Wire: ASTM A 641, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.
      3) Wire Hangers: ASTM A 641, Class 1 zinc coating, soft temper, 0.162-inch (4.12-mm) diameter.
5. Furring:
   a. Steel Studs for Furring: ASTM C 645, with flange edges bent back 90 deg and double over to form 3/16-inch minimum lip (return). Use for primary suspension members where indicated.
      1) Minimum Base-Metal Thickness:
         (a) 0.0359-inch (20 gage) for studs less than 4 inches in depth.
         (b) 0.0299-inch (22 gage) for studs 4-inches or greater in depth.
      2) Depth: As indicated.
      3) Protective coating: ASTM A 653, G 60 (ASTM A 653M, Z180) hot-dip galvanized.
   b. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
      1) Use for secondary suspension members where indicated.
         (a) Minimum Base Metal Thickness: 0.0179 inch (0.45 mm).
         (b) Depth: 7/8-inch.
         (c) Protective coating: ASTM A 653, G 60 (ASTM A 653M, Z180) hot-dip galvanized.
   c. Resilient Furring Channels: 1/2 inch (12 mm) depth, for attachment to substrate through one leg only.
      1) Manufacturer's standard product designated to reduce sound transmission, fabricated from steel sheet complying with ASTM A 653 or ASTM A 568.
      2) Asymmetric-shaped channel with face connected to a single flange by a single-slotted leg (web) or hat-shaped channel, with 1-1/2-inch wide face connected to flanges by double-slotted or expanded-metal legs.
      3) Manufacturers - Resilient Furring Channels:
         (a) Same manufacturer as other framing materials.

C. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05 4000.

D. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI SG02-1.
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
   3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
   4. Deflection and Firestop Track:
      a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
      b. Acceptable Products:
         1) FireTrak Corporation; Posi Klip.
         2) Metal-Lite, Inc.; The System.

2.3 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. Georgia-Pacific Gypsum: www.gpgypsum.com.
   2. National Gypsum Company: www.nationalgypsum.com.
   3. USG Corporation: www.usg.com.
   4. Substitutions: See Section 01 6300 - Product Substitution Procedures.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut, edges tapered.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
   3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   4. Thickness:
      a. Vertical Surfaces: 5/8 inch (16 mm).
      b. Ceilings: 5/8 inch (16 mm).
      c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
   5. Paper-Faced Products:
      a. Georgia-Pacific Gypsum; ToughRock Fireguard X Gyspum Board.
      b. USG Corporation; Sheetrock Brand Firecode Core (Type X) Gypsum Panels.
      c. National Gypsum Co.; Gold Bond Brand Fire-Shield Gypsum Board.

C. Abuse Resistant Wallboard:
   1. Application: Corridors and other areas indicated on drawings.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.

4. Type: Fire resistance rated Type X, UL or WH listed.
5. Thickness: 5/8 inch (16 mm).
6. Edges: Tapered.
7. Products:
   a. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold Guard Abuse-Resistant Gypsum Board.
   b. USG Corporation; Sheetrock Brand Mold Tough AR Firecode X Panels.
   c. National Gypsum Co.; Goldbond Brand Hi-Abuse XP Gypsum Board.

D. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
1. Application: Vertical surfaces behind thinset tile, except in wet areas.
   a. Wet Areas: Areas subjected to constant moisture, water or liquids such as shower/bathing areas and commercial food processing.
   b. Non-Wet Areas: Include vertical wall areas at toilets, lavatories and backsplashes scheduled to receive thinset tile.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Type X Thickness: 5/8 inch (16 mm).
4. Edges: Tapered.
5. Products:
   a. Georgia-Pacific Gypsum; ToughRock Mold-Guard Gypsum Board.
   b. National Gypsum Company; Gold Bond XP Fire-Shield Gypsum Board.
   c. USG Corporation, Sheetrock Brand Mold Tough Gypsum Panels, Firecode Core Type X.

E. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
1. Application: Exterior sheathing, unless otherwise indicated.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
4. Core Type: Type X, as indicated.
5. Regular Board Thickness: 5/8 inch (16 mm).
6. Edges: Square, for vertical application.
7. Glass Mat Faced Products:
   a. Georgia-Pacific Gypsum; DensGlass Sheathing.
   b. National Gypsum Company; Gold Bond eXP Sheathing.
   c. USG Corporation; Securock.

F. Exterior Soffit Board: Exterior soffit board as defined in ASTM C1177/C1177M; sizes to minimize joints in place; ends square cut, non-sag.
1. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
2. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate.
3. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
4. Type X Thickness: 5/8 inch (16 mm).
5. Edges: Tapered.
6. Products:
   a. Georgia-Pacific Gypsum; DensGlass Sheathing.

b. USG Corporation; Securock Brand Glas-Mat Sheathing Board.
c. National Gypsum Company; Gold Bond Brand eXP Sheathing Board.

2.4 ACCESSORIES

A. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
   3. Provide accessories as required to achieve industry standard for detail indicated, whether or not speciifc accessories are shown on drawings.
   4. Manufacturers - Finishing Accessories:
      a. Same manufacturer as framing materials.

B. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch (50 mm) wide, minimum, coated glass fiber tape for joints and corners, except as otherwise indicated.
   2. Ready-mixed vinyl-based joint compound.
   3. Chemical hardening type compound or (easy sand) lightweight setting type compound at areas of soffit board .

C. Textured Finish Materials: Latex-based compound; plain.

D. Screws for Attachment to Steel Members Less Than 0.033 inch (0.84 mm) In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium plated for exterior locations.

E. Screws for Attachment to Steel Members From 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.

F. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.2 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Level ceiling system to a tolerance of 1/600.
   2. Laterally brace entire suspension system.

3. Install bracing as required at exterior locations to resist wind uplift.

C. Studs: Space studs at 16 inches on center (at 406 mm on center).
   1. Extend partition framing to structure, where indicated, or a minimum of 12 inches (305 mm) above ceiling and braced to structure above, as indicated or required.
   2. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Standard Wall Furring: Install, where indicated, at concrete, masonry, and plastered walls and base partitions scheduled to receive gypsum board, not more than 4 inches (100 mm) from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 16 inches (406.4 mm) on center.
   1. Orientation: Vertical or Horizontal, as required for installation.
   2. Spacing: At 16 inches (400 mm) on center.
   3. Size as indicated by furring type.

F. Acoustic Furring: Install resilient channels at maximum 24 inches (600 mm) on center. Locate joints over framing members.

G. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.

H. Blocking: Coordinate location and installation of 18 gage, minimum, mechanically fastened steel sheet blocking for support at all items requiring blocking, including but not limited to the following:
   1. Wall mounted cabinets.
   2. Plumbing fixtures.
   3. Toilet partitions.
   4. Toilet accessories.
   5. Wall mounted door hardware.
   6. Shelving.
   7. Owner provided equipment located on plans.
   8. Contractor furnished equipment.

3.3 BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.

C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
   1. Seal joints, cut edges, and holes with water-resistant sealant.

F. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.
   1. Seal joints, cut edges, and holes with water resistant sealant.
   2. Allow minimum 1/4 inch (6 mm) between edge of soffit board and adjacent construction at perimeter.

G. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

3.4 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.
   2. At exterior soffits, not more than 30 feet (10 meters) apart in both directions.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.5 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.

B. Paper Faced Gypsum Board: Use fiberglass joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.

a. Including areas to receive dry-erase coatings. Refer to Section 09 9735 - Dry-Erase Coatings.

2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
3. Level 3: Walls to receive textured wall finish.
   a. Exterior soffit area to receive painted finish.
4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
5. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
6. Level 0: Temporary partitions.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).
   2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
   3. Taping, filling and sanding is not required at base layer of double layer applications.

E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
   1. Contractor's option.

F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.6 TEXTURE FINISH

A. Apply finish texture coating by means of recommended application in accordance with manufacturer's instructions and to match approved sample.

B. Exterior gypsum board soffit panels:
   1. Texture Required: Light Sand Finish.

3.7 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

END OF SECTION

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SECTION 09 3000
TILING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Porcelain floor tile.

B. Ceramic tile base.

C. Waterproof membrane for thin-set tile installations.

D. Crack-suppression membrane for thin-set tile installations.

E. Edge protection installed as part of tile installations.

1.3 RELATED REQUIREMENTS

A. Division 01 - "Product Substitution Procedures".

B. Division 03 - "Cast-In-Place Concrete".

C. Division 03 - "Under-Slab Vapor Barrier".

D. Division 07 - "Joint Sealers".

E. Division 09 - "Gypsum Board Assemblies".

1.4 REFERENCE STANDARDS

A. ANSI Standards: ANSI A108 series of tile installation standards; ANSI A118 series on mortars, grouts and membranes standards; and in ANSI A137.1 apply to Work of this Section unless otherwise specified. Sections included are not limited to the following:
   1. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.1A, ANSI A108.1B, ANSI A108.1C, ANSI A108.4, ANSI A108.5, ANSI A108.6, ANSI A108.8, ANSI A108.9, ANSI A108.10, ANSI A108.11, ANSI A108.12, ANSI A108.13, ANSI A108.14, ANSI A108.15, ANSI A108.16, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."
   2. ANSI A118 Series: ANSI A118.3, ANSI A118.4, ANSI A118.10, ANSI A118.12.

B. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.

C. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014.

D. ASTM C627 - Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester; 2010.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.

F. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2015.

G. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes; 2011.

H. TCNA Handbook for Ceramic, Glass, and Stone Tile Installation; most recent edition.

1.5 DEFINITIONS

A. Face Size: Actual tile size, excluding spacer lugs.

B. Module Size: Actual tile size plus joint width indicated.

1.6 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
   1. Level Surfaces: Minimum 0.60 (SCOF) wet.
   2. Step Treads: Minimum 0.60 (SCOF) wet.
   3. Ramp Surfaces: Minimum 0.80 (SCOF) wet.

B. Dynamic Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following value as determined by testing identical products per DCOF AcuTest by the Tile Council of North America:
   1. Level Surfaces: Minimum 0.42 (DCOF) wet.

1.7 SUBMITTALS

A. General: The following submittal package shall be submitted as a complete package, including the following listed below. Individual submittals will be returned unaccepted until the complete package is submitted.

B. Product Data: For each product indicated.

C. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints.

D. Samples:
   1. Submit a minimum of 12 by 12 inch of each type, composition, color, and finish of tile.
   2. Assembled samples with grouted joints for each type, composition, color, and finish of tile.

3. Full-size units of each type of trim and accessory for each color and finish required.
4. Metal thresholds in 6-inch (150-mm) lengths.
5. Metal edge strips in 6-inch (150-mm) lengths.

E. Acceptance of Substrate: Provide letter of substrate acceptance, signed by Contractor, Manufacturer and Installer as required in Part 3 – Execution, of this specification.

F. Qualification Data: For qualified Installer.

G. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

H. Product Certificates: For each type of product, signed by product manufacturer.

I. Material Test Reports: For each tile-setting and -grouting product. Submit a copy of the testing results listed below to comply with the manufacturer's substrate preparation and installation instructions:
   1. Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs per ASTM F 2170.
   2. Anhydrous Calcium Chloride Test to determine the MVER.
   3. Record the test results for the RH on the ASTM F 2170-09 Checklist and the MVER on the ACC test worksheet, included at the end of this section. Follow the testing preparation, procedures and the flooring manufacturer's acceptable requirements as indicated in Part 3.
   4. Provide flooring manufacturer's adhesive recommendation in writing per testing, substrate, moisture sealer and flooring type.

1.8 QUALITY ASSURANCE

A. Maintain one copy each of ANSI A108/A118/A136.1 and TCNA Handbook on site.

B. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.
   1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.

C. Source Limitations for Setting, Grouting and Waterproofing/Crack-Suppression Materials:
   1. Obtain ingredients of a uniform quality for each mortar, adhesive, elastomeric sealant, substrate preparation and grout component from a single manufacturer and each aggregate from one source or producer.
   2. Obtain ingredients for each waterproofing and crack suppression membrane and floor drain waterproofing membrane from a single manufacturer.

D. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
   1. Metal thresholds.

2. Waterproof membrane and Crack Isolation Membrane.
3. Joint sealants.
4. Cementitious backer units.
5. Metal edge strips.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Provide a minimum of 4 feet by 4 feet of wall and floor tile installation for each type and substrate.
   2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Pre-installation Conference: Conduct conference at Project site one week prior to installation.
   1. Attendees should include Owner's representative, Architect, manufacturer's representative, installer superintendant and representatives of adjacent work in progress.
   2. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.

D. Store liquid materials in unopened containers and protected from freezing.

E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.10 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.11 WARRANTY

A. Special Project Warranty: Submit flooring Installer’s Warranty, on warranty form at the end of this section, signed by Installer, covering Work of the Section, for the following warranty period of 2 years from date of substantial completion.

1.12 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Tile and Trim Units: Furnish quantity of full-size units equal to five (5) percent of amount installed, but not less than one (1) full boxfor each type, composition, color, pattern, finish and size indicated.
   2. Grout: Furnish quantity of grout equal to five (5) percent of amount installed for each type, composition, and color indicated. Material shall be in full unopened containers.

PART 2 PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
   1. Provide tile complying with Standard grade requirements unless otherwise indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.

C. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
   1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.

2.2 TILE PRODUCTS

A. Floor Tile (PT-1)
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Manufacturers:
         1) **BASIS OF DESIGN**: American Olean: www.americanolean.com.
            (a) Collection Name: Shadow Bay.
            (b) Color: As noted on drawings.
         2) Prior approved equal.
         3) Substitutions: See Section 01 6300 - Product Substitution Procedures.
            (a) Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.

(b) Color and finish of alternate or Architect approved material will be selected by Architect from manufacturer's full range.

b. Properties and Characteristics:

1) Flat tile as follows:

(a) Size: 12 by 12 by 5/16 inch (305 by 305 by 8 mm) nominal.

(b) Grout Joint Width: 3/16 inch (4.8 mm).

(c) Grout Color: As selected by Architect from manufacturer's full range.

B. Ceramic Tile Base (PTB-1)

1. Products: Subject to compliance with requirements, provide one of the following:

a. Manufacturer's

1) **BASIS OF DESIGN**: American Olean: www.americanolean.com.

(a) Collection Name: Shadow Bay.

(b) Color: As noted on drawings.

2) Prior Approved equal.

3) Substitutions: See Section 01 6300 - Product Substitution Procedures.

(a) Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.

(b) Color and finish of alternate or Architect approved material will be selected by Architect from manufacturer's full range.

b. Properties and Characteristics:

1) Flat Tile as follows:

(a) Size: 6 inches (152 mm) high x 12 inches (305 cm) long, nominal. Cove Base.

(b) Grout Joint Width: To match floor grout joint size.

(c) Grout Color: As selected by Architect from manufacturers full range.

2.3 SETTING MATERIALS

A. Portland Cement Mortar (Thin Set): ANSI A118.4

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Laticrete; 272 Mortar. **BASIS OF DESIGN.**

1) Provide mortar that is GreenGuard Indoor Air Quality Certified with total VOC content 0.00 lb./gallon.

b. Custom Building Products.

c. MAPEI Corporation.

d. Summitville Tiles, Inc.

2. Provide a high performance bagged cementitious powder to be mixed with water for thin-set installation. Provide unmodified setting materials as recommended per waterproofing and crack isolation material manufacturer.

3. Substrate Limitations:
   a. Surfaces must be structurally sound, stable and rigid enough to support tile.
   b. Substrate deflection must not exceed L/360.
4. For wall applications, provide mortar that complies with requirements for non-sagging mortar in addition to the other requirements in ANSI A118.4.
5. Location: Ceramic wall tile and ceramic floor tile locations.

2.4 GROUT MATERIALS

A. Water-Cleanable Epoxy Grout: ANSI A118.3. Grout material shall be 100% solids epoxy compound for grouting tile as specified. Grout shall be sag-resistant and have bond strength greater than 1000 psi.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Laticrete; SpectraLOCK PRO Premium Grout. **BASIS OF DESIGN.**
         1) Provide at all tile unless noted otherwise.
         2) Provide grout that is GreenGuard Indoor Air Quality Certified with total VOC content 0.00026 lb./gallon.
      b. Custom Building Products.
      c. Laticrete International, Inc.
      d. MAPEI Corporation.
      e. Summitville Tiles, Inc.
   2. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F and certified by manufacturer for intended use.
   3. Color: To be selected by Architect from manufacturer's full range.

2.5 ACCESSORY MATERIALS

A. Polyethylene Waterproofing Membranes for Tile Installation: Manufacturer’s standard product that complies with ANSI A118.10, selected from the following:
   1. General: Manufacturer's high-density polyethylene (HDPE) sheet product, that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
   2. Waterproofing Membranes for Tile Installation: Provide sheet-applied bonded waterproofing membrane as required to comply with the installation schedule.
      a. Products: Subject to compliance with requirements, provide one of the following:
         1) Schluter Systems L.P.; Schulter-KERDI. **BASIS OF DESIGN**.
            (a) Provide at all wall tile applications in the restrooms, unless noted otherwise.
         2) Prior approved equal.
         3) Substitutions: See Section 01 6300 - Product Substitution Procedures.
      b. Description: A minimum of 0.008 inch thick, orange polyethylene membrane with polypropylene fleece laminated on both sides.
         1) Waterproofing shall meet or exceed requirements of the "American National Standard Specifications for load bearing, bonded, waterproof membranes for thin-set tile installation A118.10".

B. Crack Isolation/Waterproofing Membranes for Tile Installation: Manufacturer's standard product that complies with ANSI A118.10, selected from the following:
   1. General: Manufacturer's standard polyethylene sheet product that complies with ANSI A118.10 and A118.12 for high performance. Include reinforcement and accessories recommended by manufacturer.
   2. Crack Isolation / Waterproofing Membrane System for Tile Installation: Provide uncoupling membrane under floor tile. Comply with installation schedule for each type of application.
      a. Products: Subject to compliance with requirements, provide one of the following:
         1) Schluter Systems L.P.; Schulter-DITRA. **BASIS OF DESIGN**.
            (a) Provide under all floor tile applications.
         2) Prior approved equal.
         3) Substitutions: See Section 01 6300 - Product Substitution Procedures.
      b. Description: Crack Isolation / waterproofing membrane shall be high density polyethylene sheet membrane with a grid structure of 1/2-inch by 1/2-inch square cavities and a polyethylene anchoring fleece laminated to the underside.
         1) Thickness: A minimum of 1/8-inch.
         2) Waterproof membrane shall provide uncoupling to neutralize the differential movement stresses between substrate and tile.
         3) Water Vapor Permeance: 0.006 perms per ASTM E96 testing.
      c. Accessories:
         1) Provide "Kerdi-Fix" or equal where wall and floor waterproofing meet.

C. Movement and Control joints: Provide a movement joint profile with edge protection as required by TCNA. Indicate location on shop drawings.
   1. Schluter Systems L.P.; Schulter-Dilex-AKWS. **BASIS OF DESIGN.**
   2. MAPEI Corporation.
   3. Prior approved equal.
   4. Substitutions: See Section 01 6300 - Product Substitution Procedures.

2.6 MISCELLANEOUS MATERIALS

A. Elastomeric Sealants: Elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 07 Section "Joint Sealants."
   1. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   2. Use primers, backer rods and sealant accessories recommended by sealant manufacturer.
      a. Laticrete; Latasil (Basis-of-Design).
      b. Custom Building Products.
      c. MAPEI Corporation.
      d. Summitville Tiles, Inc.
   3. One-Part, Mildew-Resistant Silicone: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O;

formulated with fungicide, intended for in-service exposures of high humidity and extreme temperatures.
a. Products:
1) Laticrete; Latasil (Basis-of-Design).
2) Dow Corning Corporation; Dow Corning 786.
3) GE Silicones; Sanitary 1700.
4) Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
5) Tremco, Inc.; Tremsil 600 White.
6) Substitutions: See Section 01 6300 - Product Substitution Procedures.

4. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.
a. Products:
1) Laticrete; Latasil (Basis-of-Design).
2) Bostik; Chem-Calk 550.
3) Mameco International, Inc.; Vulkem 245.
4) Pecora Corporation; NR-200 Urexpan.
5) Tremco, Inc.; THC-900.
6) Substitutions: See Section 01 6300 - Product Substitution Procedures.

B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials.
1. Laticrete NXT.
2. Prior approved equal.
3. Substitutions: See Section 01 6300 - Product Substitution Procedures.

C. Transition Strips including (**TS-1)**: The transition strips shall meet or exceed the recommendations of the Americans with Disabilities Act (ADA). Transitional strips shall provide a gradual transition between flooring of varying heights and in maximum lengths to minimize running joints.
1. Manufacturers:
a. Schluter.
1) Profile: Schiene.
2) Material/Finish: Satin Anodized aluminum.
b. Prior approved equal.
c. Substitutions: See Section 01 6300 - Product Substitution Procedures.
2. Location: As indicated on drawings and in finish legend.

D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.7 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

B. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

C. Verify that concrete substrates for tile floors installed with thin-set mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.

D. Verify that surfaces that received a steel trowel finish have been mechanically scarified.

E. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.

F. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.

G. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

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

3.2 CONCRETE SUBSTRATE TESTING

A. Provide the Relative Humidity Test using the In-Situ Probes, complying with ASTM F 2170 "Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs, provide the testing preparation and procedure recommended below:
   1. Provide in-situ concrete relative humidity testing at 40 percent of concrete thickness for substrate specified to receive flooring.
      a. The test site should be maintained at the same temperature and humidity conditions as those anticipated during normal occupancy and those listed in Part 1, as required by the flooring manufacturer.
         1) When a building is not under HVAC control, a recording hygrometer or data logger shall be in place recording conditions during the test period. A transcript of this information must be included with the test report.

b. The number of in-situ relative humidity test sites is determined by the square footage of the facility. The minimum number of tests to be placed is equal to 3 in the first 1,000 square feet and 1 per each additional 1,000 square feet.
c. Determine the thickness of the concrete slab, typically from construction documents.
d. Drill test hole to a depth equal to 40 percent of the concrete thickness. Hole diameter shall not exceed outside diameter of the probe by more than 0.4-inches. Drilling operation must be dry.
e. Vacuum and brush all concrete dust from test hole.
f. Insert a relative humidity probe (sensor) to the full depth of test hole. Place cap over probe.
g. Permit the test site to acclimate or equilibrate for 1-2 hours prior to taking relative humidity readings.
h. Remove the cap, insert the cylindrical reading device and press button on the device to obtain reading from the in-situ probe.
i. Record temperature and relative humidity at the test site on the ASTM F 2170-09 checklist provided.

B. Maximum Acceptable Testing Limits:
1. Relative Humidity shall not to exceed 85% (percent) relative humidity (RH).

C. Proceed with installation only after the substrate passes the testing. Follow flooring manufacturer's written recommendations for installing material as required to obtain flooring manufacturer's warranty.

D. See specification Section 09 0561 - Common Work Results for Flooring Preparation should substate not pass testing procedures.

3.3 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

B. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions.

C. Remove protrusions, bumps, and ridges by sanding or grinding.

D. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.

E. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.4 INSTALLATION, GENERAL

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.

C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

F. Movement and Control Joints: Locate expansion joints and other sealant-filled joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
   1. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
   2. Provide joints at the following locations unless indicated otherwise on the drawings.
      a. Provide joints as recommended per TCA, Handbook for Ceramic Tile Installation.
      b. Locate joints in tile surfaces directly above joints in substrates expansion, control and construction joints.
      c. Interior locations joints shall not exceed 20 feet in either direction.
      d. Joints should be installed with tilework abuts retraining surfaces such as perimeter walls, dissimilar floors, columns, etc.

G. Grout tile to comply with requirements of ANSI A108.10, unless otherwise indicated.
   1. For chemical-resistant epoxy grouts, comply with ANSI A108.6.

H. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
   1. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

I. Apply grout sealer to grout joints in tile walls according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout

joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.5 WATERPROOFING INSTALLATION

A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.

B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.6 CRACK ISOLATION MEMBRANE INSTALLATION

A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.

B. Do not install tile or setting materials over crack isolation membrane until membrane has cured.

3.7 FLOORING INSTALLER'S WARRANTY

A. Refer to **Appendix B** for required documentation.

END OF SECTION

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SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.3 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 07 2100 - Thermal Insulation: Acoustical insulation.

C. Division 23 - Air Outlets and Inlets: Air diffusion devices in ceiling.

D. Division 26 - Interior Lighting: Light fixtures in ceiling system.

1.4 REFERENCE STANDARDS

A. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2013.

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2014.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.6 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. See Section 01 3300 - Submittal Procedures.

C. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.

D. Product Data: Provide data on suspension system components and acoustical units.

E. Samples: Submit two samples 6 by 6 inch (152.4 by 152.4 mm) in size illustrating material and finish of acoustical units.

F. Samples: Submit two samples each, 12 inches (305 mm) long, of suspension system main runner, cross runner, and perimeter molding.

G. Manufacturer's Installation Instructions: Indicate special procedures.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.
      a. For each type of tile and finish.
      b. Round up to complete boxes of material. One full box minimum.

1.7 QUALITY ASSURANCE

A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.

D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Preinstallation Conference: Conduct conference at Project site.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned

space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.9 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

B. Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at levels indicated for Project when occupied for its intended use.

C. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content. Operate ventilation system for not less than 48 hours before beginning acoustical panel ceiling installation.

1.10 COORDINATION

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system and partition assemblies.

1.11 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Provide a minimum of 5% of ceiling area in whole tiles for extra materials.

1.12 WARRANTY

A. Manufacturer shall warrant all components of the acoustical ceiling system against failure associated with humidity including sagging, warping and rusting for a period of thirty (30) years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acoustic Panels: As indicated for each ceiling panel type.
   1. **BASIS OF DESIGN**:
      a. Armstrong World Industries, Inc.: www.armstrong.com.
   2. Alternate Manufacturers:
      a. CertainTeed Corporation: www.certainteed.com.
      b. USG: www.usg.com.
      c. Substitutions: See Section 01 6300 - Product Substitution Procedures.

1) Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.

B. Suspension Systems:
   1. Same as for acoustical units of each ceiling panel type.

2.2 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.
   1. Antimicrobial Fungicide Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment consisting of manufacturer's standard formulation with fungicide added to inhibit growth of mold and mildew and showing no mold or mildew growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

B. Acoustical Tile Type ACT -2: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
   1. Tile to match existing ceiling tile, size, finish, texture and color.
   2. VOC Content: As specified in Section 01 6116.
   3. Size: 24 by 24 inches (610 by 610 mm).
   4. Thickness: 3/4 inches (19 mm).
   5. Composition: Wet-formed mineral fiber.
   6. Light Reflectance: 0.86 percent, determined in accordance with ASTM E1264.
   7. NRC Rating: 0.70, determined in accordance with ASTM E1264.
   8. Ceiling Attenuation Class (CAC): 33-35, determined in accordance with ASTM E1264.
   9. Edge: 15/16 inch (24 mm) Angled Tegular.
   10. Surface Color: White.
   11. Surface Pattern: Fine (medium texture) to match existing.
   12. Products:
      a. **BASIS OF DESIGN:** Armstrong World Industries, Inc.; Cirrus Tegular, Item 584: www.armstrong.com.

2.3 SUSPENSION SYSTEM(S)

A. Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
   1. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
   2. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
      a. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch (2.69-mm-) diameter wire.

3. Provide Hanger Rods or Flat Hangers from mild steel, zinc coated or protected with rust-inhibitive paint as required.
4. Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.
   a. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension system indicated and that match width and configuration of exposed runners, unless otherwise indicated.
   b. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
      1) Provide the following products along walls when reveal edge panels require being cut. Panel shall be cut straight to fit within the area.
   c. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

B. Exposed Steel Suspension System Type ACT 2: Formed galvanized steel, commercial quality cold rolled; intermediate-duty.
   1. Profile: Tee; 15/16 inch (24 mm) wide face.
   2. Construction: Double web.
   3. Finish: White painted.
   4. Products:
      a. Manufacturers:
         1) **BASIS OF DESIGN:** Armstrong World Industries, Inc., Prelude, 15/16 inch (24 mm): www.armstrong.com.

2.4 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same material and finish as grid.
   1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

C. Acoustical Sealant For Perimeter Moldings: Manufacturer's recommended non-hardening, non-skinning, for use in conjunction with suspended ceiling system.

D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.2 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

E. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

I. Support fixture loads using supplementary hangers located within 6 inches (150 mm) of each corner, or support components independently.

J. Do not eccentrically load system or induce rotation of runners.

K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Install in bed of acoustical sealant.
   2. Use longest practical lengths.
   3. Overlap and rivet corners.

L. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch (25 mm) movement. Maintain visual closure.

3.3 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.

G. Where round obstructions occur, provide preformed closures to match perimeter molding.

H. Lay acoustical insulation for a distance of 48 inches (1200 mm) either side of acoustical partitions as indicated.

I. Install hold-down clips on panels within 20 ft (6 m) of an exterior door.

3.4 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

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SECTION 09 6513.13
RESILIENT BASE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Resilient base.

B. Installation accessories.

1.3 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 09 2116 - Gypsum Board Assemblies.

1.4 REFERENCE STANDARDS

A. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012)e1.

1.5 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

D. Verification Samples: Submit two samples, 4 by 4 inch (101.6 by 101.6 mm) in size illustrating color and pattern for each resilient flooring product specified.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Wall Base: 50 linear feet (16 linear meters) of each type and color.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store floor base 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 (10 deg C) or more than 90 deg F (32 deg C). Store floor tiles on flat surfaces.

1.7 FIELD CONDITIONS

A. Install materials in suitalbe conditions per manufacturer's recommendations to assure proper bond and adherence to substrate.

1.8 WARRANTY

A. Manufacturer's Warranty: Provide warranty for resilient base. The warranty period shall be a minimum of five (5) years after substantial completion.

PART 2 PRODUCTS

2.1 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; Straight.
   1. Height: 4 inch (100 mm).
   2. Thickness: 0.125 inch (3.2 mm) thick.
   3. Finish: Matte.
   4. Length: Roll. Continuous Coil.
   5. Corners: Preformed.
   6. Color: As indicated on drawings and in finish schedule.
   7. Manufacturers:
      a. **BASIS OF DESIGN:** Roppe Corp.: www.roppe.com.
      b. Alternate Manufacturers:
         1) Johnsonite, a Tarkett Company: www.johnsonite.com.
         2) Prior Approved equal.
      c. Substitutions: See Section 01 6000 - Product Substitution Procedures.
         1) Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.

2.2 ACCESSORIES

A. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

3.2 PREPARATION

A. Clean substrate.

B. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Spread only enough adhesive to permit installation of materials before initial set.

3.4 RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.

B. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.5 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's instructions.

END OF SECTION

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SECTION 09 6813
TILE CARPETING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Carpet tile, fully adhered.

1.3 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

C. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.

1.4 REFERENCE STANDARDS

A. AATCC-134 - Electrostatic Propensity of Carpets; 2011.

B. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2006 (Reapproved 2011).

C. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2014c.

D. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 2015.

E. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.

F. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2011.

G. Consumer Public Safety Commission (CPSC) FF1-70; Current Edition.

1.5 SUBMITTALS

A. Shop Drawings: Indicate layout of joints, direction of carpet pile, and location of edge moldings.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.

D. Submit two, 12 inch (305 mm) long samples of edge strip and base cap.

E. Manufacturer's Installation Instructions: Indicate special procedures.

F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum five years documented experience.

B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.7 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
   1. Warranty Period: Two (2) years from the date of Substantial Completion.

B. Special Warranty for Carpet Tiles: Manufacturer warrants that carpet products will resist moisture penetration through the backing material and will not fail under ordinary indoor commercial use. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, and delamination. This warranty will also cover the affects of excessive static discharge during this warranty period.
   1. Warranty Period: Fifteen years (15) from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Tile Carpeting:
   1. **BASIS OF DESIGN:** Interface, Inc.: www.interface.com.
   2. Alternate manufacturers:
      a. Prior Approved Equal.
   3. Substitutions: See Section 01 6000 - Product Requirements.
      a. Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, **and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.**
      b. Color selections for alternates and Architect accepted substitutions will be selected by Architect from manufacturer's full range.

2.2 MATERIALS

A. **BASIS OF DESIGN**: These selections are to be used together. No alterations or substitutions. No exceptions without approval of the Architect.
   1. Carpet Tile Type CP-1: Tufted Textured Loop, manufactured in one color dye lot.
      a. Product: Furrows II manufactured by Interface, Inc.: www.interface.com.
      b. Fiber: Manufactured by Universal, Type 6,6 Nylon.
      c. Dye Method: 100% Solution Dyed.
      d. Tile Size: 19 .69 x 19.69 inch (50 x 50 cm), nominal.
      e. Thickness: 0.117 inch (3 mm).
      f. Color: As indicated on drawings.
      g. Pattern: As indicated on drawings.
      h. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
      i. Gage: 1/12 inch (47.2 ends per 10 cm).
      j. Stitches: 8.7 per inch (34.3 ends per 10 cm).
      k. Pile Weight: 17 oz/sq yd (576 gm/sq m)/(tufted yarn weight).
      l. Pile Density: 5,231 ounces per cubic yard (192.1 grams per cubic meter).
      m. Light Fastness: (AATCC 16 - E) >/= 4.0 @ 60 AFU's.
      n. Primary Backing Material: GlasBac, Thermoplastic.
      o. Total Weight: 129 oz/sq yd (4,374 g/sq m).
      p. Protective Treatments: Protekt- Soil/Stain, Intersept- Preservation
      q. Testing:
         1) Radiant Panel: Passes Class I per ASTM E648.
         2) NBS Smoke: Less the 450 per ASTM E662.
         3) Electrostatic Propensity: Less than or equal to 3.0 kV per AATCC-134.

2.3 ACCESSORIES

A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.

B. Adhesives:
   1. Compatible with materials being adhered; maximum VOC content as specified in Section 01 6116.

C. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.

D. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
   1. Test in accordance with Section 09 0561.
   2. Obtain instructions from flooring manufacturer if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.2 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 0561.

3.3 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile in specified pattern, with pile direction parallel to next unit, set parallel to building lines.

F. Locate change of color or pattern between rooms under door centerline.

G. Fully adhere carpet tile to substrate.

H. Trim carpet tile neatly at walls and around interruptions.

I. Complete installation of edge strips, concealing exposed edges.

3.4 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

3.5 FLOORING INSTALLER'S WARRANTY

A. Refer to **Appendix B** for required documentation.

END OF SECTION

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SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Exposed surfaces of steel lintels and ledge angles.
   2. Mechanical and Electrical:
      a. In finished areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically so indicated.
   8. Ceramic and other tiles.
   9. Brick, architectural concrete, cast stone, integrally colored plaster and stucco.
   10. Glass.
   11. Acoustical materials, unless specifically so indicated.

1.3 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 08 1113 - Hollow Metal Doors and Frames.

C. Section 08 1416 - Flush Wood Doors.

D. Section 09 2116 - Gypsum Board Assemblies.

E. Section 09 9600 - High-Performance Coatings.

F. Section 22 - Identification for Plumbing Piping and Equipment: Painted Identification.

G. Section 23 - Identification for HVAC Piping and Equipment: Painted Identification.

H. Section 26 - Identification for Electrical Systems: Painted identification.

1.4 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.5 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2012.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.

D. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.

1.6 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   4. Manufacturer's installation instructions.
   5. If proposal of substitutions is allowed under submittal procedures, explanation of all substitutions proposed.

C. Samples: Submit two paper chip samples, 12 x 12 inch (304.8 x 304.8 mm) in size illustrating range of colors available for each surface finishing product scheduled.

D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and coated surfaces, and color samples of each color and finish used.

G. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Paint and Coatings: 1 gallon (4 L) of each color; store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum five years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.8 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.

B. Provide door and frame assembly illustrating paint coating color, texture, and finish.

C. Locate where directed by Architect.

D. Mock-up may remain as part of the work.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.10 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide all paint and coating products from the same manufacturer .
   1. In the event that a single manufacturer cannot provide all specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
   2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.

B. Paints:
   1. Benjamin Moore & Co (**BM**): www.benjaminmoore.com. (**Basis of Design**).
   2. PPG Architectural Finishes, Inc. (**PPG**): www.ppgaf.com.
   3. Sherwin-Williams Company (**SW**): www.sherwin-williams.com.

C. Primer Sealers: Same manufacturer as top coats.

D. Block Fillers: Same manufacturer as top coats.

E. Substitutions: See Section 01 6000 - Product Requirements.
   1. Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, **and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final**.

2.2 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
4. Supply each coating material in quantity required to complete entire project's work from a single production run.
5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content: Comply with Section 01 6116.

D. Flammability: Comply with applicable code for surface burning characteristics.

E. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

F. Colors: As indicated on drawings
   1. Extend colors to surface edges; colors may change at any edge as directed by Architect.
   2. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
      a. Unless directed otherwise by the Architect.
   3. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color schedule.

2.3 PAINT SYSTEMS - EXTERIOR

A. Paint E-OP - All Exterior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including primed metal.
   1. Preparation as specified by manufacturer.
   2. Two top coats and one coat primer.
   3. Semi-Gloss: MPI gloss level 5; use this sheen for items subject to frequent touching including metal doors and frames, wet mils: 5.4 mil to 8.2 / dry mils: 2.0 to 3.0 per coat.

B. Paint MgE-OP-3L - Galvanized Metals, Latex, 3 Coat:
   1. One coat acrylic latex primer.
      a. BM: Super Spec HC Metal Primer, P04.
      b. PPG: Pitt-Tech Plus Interior/Exterior DTM Industrial Primer, 90-912 Series.
      c. SW: Pro-Cryl Universal Primer, B66-310 Series.
   2. Semi-gloss: Two coats of latex enamel.
      a. BM: WaterBased Urethane, M73 Series.
      b. PPG: Durethane WB, 98-8200 Series.
      c. SW: Hydrogloss WaterBased Urethane, B65-180 Series.

2.4 PAINT SYSTEMS - INTERIOR

A. Paint I-OP - All Interior Surfaces Indicated to be Painted, Unless Otherwise Indicated: Including gypsum board, wood, and shop primed steel.
   1. Two top coats and one coat primer.
   2. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces.
      a. 4 wet mils, 1.3 dry mils per coat, minimum.
   3. Eggshell: MPI gloss level 3; use this sheen for gypsum board vertical surfaces.
      a. 4 wet mils, 1.6 dry mils per coat, minimum.
   4. Semi-Gloss: MPI gloss level 5; use this sheen for for items subject to frequent touching by occupants, including doors, door frames.
      a. 4 wet mils, 1.5 dry mils per coat, minimum.

B. Paint WI-OP-3L - Wood, Opaque, Latex, 3 Coat:
   1. One coat of latex primer sealer.
      a. BM: Sure Seal Latex primer/sealer, 027.
      b. PPG: SEAL GRIP Universal latex primer, 17-921.
      c. SW: PrepRite ProBlock int/ext latex primer sealer, B51 series..
   2. Semi-gloss: Two coats of latex enamel.
      a. BM: Ultra Spec HP DTM acrylic, HP29.
      b. PPG: Pitt Tech Plus Int/Ext S/G DTM, 90-1200.
      c. SW: Pro Industrial Acrylic S/G, B66-650.

C. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
   1. One coat of latex primer.
      a. BM: Super Spec HP Metal Primer, P04.
      b. PPG: Pitt-Tech Plus Interior/Exterior DTM Industrial Primer, 90-912 Series.
      c. SW: Pro-Cryl Universal Primer, B66-310 Series.
   2. Semi-gloss: Two coats of latex enamel:
      a. BM: Acrylic Epoxy Coating (Semi-Gloss), M43/M44.
      b. PPG: Pitt-Glaze WB Water-Borne Acrylic Epoxy (Semi-Gloss), 16-551 Series.
      c. SW: Pro Industrial Water Based Catalyzed Epoxy (Gloss), B73-300 Series.

D. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat; (**Ceilings**):
   1. One coat of latex primer sealer.
      a. BM: Super Spec, 253.
      b. PPG: Speedhide Interior Latex Sealer Quci Drying, 6-2.
      c. SW: ProMar 200 0 VOC Primer, B28W2600.
   2. Flat: Two coats of latex enamel:
      a. BM: Natura, 512.
      b. PPG: Pure Performance Interior Flat Latex, 9-100 Series.
      c. SW: Harmony, B5-1000 Series.
   3. Ceiling Color to be white as selected by the Architect from the manufacturer's full range.

E. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat; (**Walls**):
   1. One coat of latex primer sealer.
      a. BM: Super Spec, 253.

b. PPG: Speedhide Interior Latex Sealer Quick Drying, 6-2.
c. SW: ProMar 200 0 VOC Primer, B28W2600.

2. Eggshell: Two coats of latex enamel:
   a. BM: Ultra Spec 500 Interior Latex (Eggshell), N538.
   b. PPG: Speedhide Zero VOC (Eggshell), 6-4300.
   c. SW: ProMar 200 Zero VOC (Eggshell), B20-2600 Series.

2.5 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.2 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or repair existing coatings that exhibit surface defects.

D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

I. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

J. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

K. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

L. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

M. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

N. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

O. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.3 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's instructions.

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

F. Sand wood and metal surfaces lightly between coats to achieve required finish.

G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

H. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

B. Owner will provide field inspection.

3.5 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.6 PROTECTION

A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

3.7 SCHEDULE - PAINT SYSTEMS

A. **Refer to paragraph 2.3 (Exterior) and paragraph 2.4 (Interior) for Paint System description. Refer to drawings for specific locations.**
   1. Gypsum Board: Finish all surfaces exposed to view.
      a. Interior Ceilings and Bulkheads: GI-OP-3L (**Ceilings**).
      b. Interior Walls: GI-OP-3L (**Walls**).
   2. Plaster: Finish all surfaces exposed to view.
      a. Exterior Soffits: GE-OP-3L.
   3. Wood Doors: Finish all surfaces exposed to view and semi-exposed surfaces.
      a. Interior: WI-OP-3L, semi-gloss.
   4. Steel Doors and Frames: Finish all surfaces exposed to view and semi-exposed surfaces.
      a. Interior: MI-OP-3L.
      b. Exterior: MgE-OP-3L.

3.8 SCHEDULE - COLORS

A. Colors indicated are the **Basis of Design**. Approved alternate colors will be as selected by the Architect from the manufacturer's full range of colors.

B. Refer to drawings for locations.

C. Interior Colors:
   1. **P1**:
      a. Manufacturer: Benjamin Moore.
      b. Color: As indicated on drawings.
   2. **P2**:
      a. Manufacturer: Benjamin Moore.
      b. Color: As indicated on drawings.
   3. **P3**:
      a. Manufacturer: Benjamin Moore.
      b. Color: As indicated on drawings.
   4. **P4**:
      a. Manufacturer: Benjamin Moore.
      b. Color: As indicated on drawings.
   5. **P5**:
      a. Manufacturer: Benjamin Moore.
      b. Color: As indicated on drawings.

D. HYDRONIC PIPING SCHEDULE
   1. General: All piping, insulated or uninsulated, exposed in mechanical room, central equipment room, stairwells, etc. shall receive two coats of paint in color specified in following schedule (as applicable to the project):
      a. Fire Protection:

1) Color:	Red	Safety Red
2) Stencil:	Fire line	SW4081
3) Letter Designation:	F	

      b. Sprinkler:

1) Color:	Red	Safety Red
2) Stencil:	Sprinkler	SW4081
3) Letter Designation:	S	

      c. Chilled Water Supply:

1) Color:	Light Blue	Spillway
2) Stencil:	Chilled Water Supply	SW4062
3) Letter Designation:	CHS	

      d. Chilled Water Return:

1) Color:	Darker Blue	Robotic Blue
2) Stencil:	Chilled Water Return	SW4063
3) Letter Designation:	CHR	

      e. Gas:

1) Color:	Yellow	Safety Yellow
2) Stencil:	Gas	SW4084
3) Letter Designation:	G	

      f. Heating Water Supply:

1) Color:	Orange	International Orange
2) Stencil:	Heat Water Supply	SW4082
3) Letter Designation:	HS	

      g. Heating Water Return:

1) Color:	Lighter Orange	Power Orange

2) Stencil: Heat Water Return SW4074
3) Letter Designation: HR

h. Condenser Water Supply From Cooling Tower:
1) Color: Light Green Emerald Green
2) Stencil: Condenser Water Supply SW4069
3) Letter Designation: CS

i. Condenser Water Return To Cooling Tower:
1) Color: Darker Green Generator Green
2) Stencil: Condenser Water Return SW4070
3) Letter Designation: CR

END OF SECTION

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SECTION 09 9600
HIGH PERFORMANCE COATINGS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Application of high-performance coating systems, including surface preparation, prime coats, and topcoats for the following substrates:
   1. Exterior:
      a. Existing roof surfaces.

1.3 REFERENCE STANDARDS

A. ASTM B 117, Salt Spray.

B. ASTM D 1308, Stain Resistance.

C. ASTM D 4060, Abrasion.

D. ASTM D 4541, Adhesion.

E. ASTM E 84, Surface Burning Characteristics of Building Materials.

F. ASTM E 308, Light Reflectance.

G. Federal Test Methods:
   1. Standard No. 141, Method 6271, Fungal Resistance.
   2. Standard No. 141, Method 6142, Scrubbability.
   3. Standard No. TT-C-550C, Paragraphs 4.4.5.2 and 4.4.5.3, Stain Removal.
   4. Standard No. TT-C-550C, Paragraph 4.4.6, Chemical Resistance.
   5. Standard No. TT-C-555B, Paragraph 4.4.7.3, Wind Driven Rain.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's descriptive data fully describing each product. Include solids by volume and manufacturer's recommendations for mixing, thinning, and curing.

B. Shop Drawings: Drawings showing lettering and logo In color to be approved by Architect.

C. Certificates: Provide manufacturer's certified test reports confirming compliance with specified performance requirements.

D. Samples: Submit two 5" x 7" samples of each selected color.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has successfully completed coating system applications similar those indicated for this Project.
   1. Applicator must be approved in writing by manufacturer and experienced in performing specified work similar in design, products and scope of this project, with a documented track record of successful, in-service performance and with sufficient production capabilities, facilities and personnel to produce specified work.
   2. A factory-trained, competent supervisor must be maintained on site during all times during which specified work is performed.

B. Single-Source Responsibility: Provide primers and undercoat material produced by the same manufacturer as the finish coats for each type of coating. Use only thinners recommended by the manufacturer and only within recommended limits.

C. Manufacturer's representative shall be available to advise applicator on proper application techniques and procedures.

D. Job Mock-Up: Minimum 50 sq. ft. application of each specified coating system on each type of substrate.
   1. Mock-ups shall serve as the standard for acceptance of the work.
   2. Leave approved mock-ups in place as part of the completed work.

E. Test Patch: Minimum 10 sq. ft application to be applied to the existing roof. After a minimum seven days, the manufacturer shall test for acceptable adhesion to the substrate.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to the job site in the manufacturer's original, new, unopened containers bearing manufacturer's name and label, and the following information:
   1. Name or title of material.
   2. Product description (generic classification or binder type).
   3. Manufacturer's name, stock number and date of manufacture.
   4. Contents by volume, for major pigment and vehicle constituents.
   5. Thinning instructions.
   6. Application instructions.
   7. Color name and number.
   8. Handling instructions and precautions.

B. Storage: Store materials in a well-ventilated and protected area at a temperature between 35 deg F and 110 deg F.

1.7 PROJECT CONDITIONS

A. Air and Surface Temperatures: Apply coatings only when the air and surface temperatures are not below 50 deg F or above 120 deg F.

B. Relative Humidity: Apply coatings only when relative humidity is not above 85 percent and the surface temperature is at least 5 deg F above the dew point.
   1. Allow wet surfaces to dry thoroughly and attain the temperature and conditions specified before proceeding with or continuing the coating operation.

C. Protection: Protect all surface not to be coated.

1.8 SURFACES NOT TO BE COATED

A. Surfaces not to be coated include but is not limited to the following:
   1. Face brick masonry.
   2. Pre-finished wall panels, partitions, and ceiling tile.
   3. Items with factory-applied final finish.
   4. Concealed ducts, pipes, and conduit.

1.9 WARRANTY

A. Manufacturer to supply owner with 15 year warranty including color and gloss retention.

B. Warranty is to be pre-approved by owner or owner's representative.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers: For the purpose of establishing the minimum functional, aesthetic, and quality standards, special coating systems are based on products as manufactured by one of the following:
   1. **BASIS OF DESIGN:** The Tnemec Company, Inc.: www.tnemec.com.
   2. Acceptable Alternates:
      a. Axalta/Dupont Performance Coatings: www.axaltacs.com.
      b. Prior approved equal.

B. Substitutions: See Section 01 6000 - Product Requirements.
   1. Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and t**he substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect**. The Architect's decision regarding this matter is final.

2.2 SPECIAL COATING MATERIALS, GENERAL

A. Special Coating Materials: System composition:
   1. **BASIS OF DESIGN:** The TNEMEC Company, Inc.

a. Spot Coat on rusty surfaces including nuts and bolts: Tnemec Series 135 Chembuild (4.0-6.0 mdft).
b. 1st Coat: TNEMEC "Series 66 Polyamide Epoxy Primer" (2.0-3.0 mdft).
c. 3rd Coat: TNEMEC "Series 1070 (Gloss)/1071 (Semi-Gloss)/1072 (Satin) Fluoropolymer" (2.5-3.0 mdft).
   1) Color/Finish/Gloss as selected by Architect at no additional cost.

B. Material Compatibility: Provide block fillers, primers, finish coat material, 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.
   1. Verify shop primer is compatible with specified field-applied coating system.

C. Material Quality: Provide the highest grade of the various coatings as regularly manufactured by acceptable coating manufacturers. Materials not displaying manufacturer's identification as a best-grade product will not be acceptable.
   1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials are 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.
   2. All materials shall meet the performance of the specified products.

D. Colors: Custom color at no additonal cost.
   1. Provide custom color match to Architect's selection per **Section 07 4113 - Metal Roof Panels**.
   2. Primer color shall be approved by the manufacturer in order to verify satisfactory color variation between primer and finish coat.

2.3 MATERIAL PREPARATION

A. Mixing: Mix and thin materials according to manufacturer's latest printed instructions.

B. Shelf Life: Do not use materials beyond manufacturer's recommended shelf life.

C. Pot Life: Do not use mixed materials beyond manufacturer's recommended pot life.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examination: Examine surfaces to be coated and report conditions that would adversely affect appearance or performance of coating systems and which cannot be put into an acceptable condition by preparatory work specified in Paragraph 3.2 of this Section.

B. Acceptance: Do not proceed with surface preparation and application until surface is acceptable or authorization to proceed is given by Architect.

3.2 SURFACE PREPARATION

A. General: Dislodge dirt, rust, plaster nibs, mortar spatter and other dry material by scraping or brushing. Remove dust and loose material by brushing, sweeping, vacuuming or blowing with high-pressure air.
   1. Remove oil, wax and grease by scraping off heavy deposits and cleaning with mineral spirits or a hot tri-sodium phosphate solution followed by a water rinse.
   2. Verify that surfaces to be coated are dry, clean and free of dust, dirt, oil, wax, grease or other contaminants.
   3. All surfaces shall be clean, dry and prepared in accordance with manufacturer’s written instructions.

B. ROOF
   1. High-pressure water blast with minimum 3500 psi and rotary nozzle with appropriate environmentally friendly cleaners to remove all soluble surface contaminants.
   2. Rusted nuts and bolts shall be cleaned per SSPC-SP3 Power Tool Cleaning.
   3. Uniformly and aggressively abrade and degloss all surfaces to achieve a uniformly profiled and deglosed surface.
   4. Preparation shall result in low dust so as to have no effect on surrounding neighbors, property and businesses

3.3 APPLICATION

A. Film Thickness: Apply materials at specified film thickness by method recommended by manufacturer.

B. Recoating: Allow each coat to dry thoroughly before recoating. Follow manufacturer's recommended recoat time.

C. Adjoining Work: Cut edges clean and sharp where work joins other materials or colors.

D. Finish Coats: Make finish coats smooth, uniform in color, and free of brush marks, laps, runs, dry spray, overspray and skipped or missed areas.

3.4 FIELD QUALITY CONTROL

A. Testing: The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during coating operations:
   1. The Owner will engage the services of an independent testing agency to sample the coating being used. Samples of material delivered to the Project site 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. Absorption.
      c. Accelerated weathering.
      d. Accelerated yellowness.
      e. Color retention.

f. Alkali and mildew resistance.
g. Abrasion resistance.
h. Apparent reflectivity.
i. Washability.
j. Dry Opacity.
k. Recoating.
l. Skinning.

3. If results show materials being used do not comply with requirements, the Contractor may be directed to stop work and remove noncomplying materials, pay for testing, recoat surfaces coated with rejected materials, or remove rejected materials from previously coated surfaces if, upon recoating with specified materials, the two coatings are not compatible.

B. Acceptance: Request acceptance of each coat before applying succeeding coats.
   1. Repair and touch-up all work that is not acceptable to Architect and request final acceptance.

3.5 CLEANING

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded materials from the site.
   1. After completing work, clean glass and spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces. Remove masking and protective covering, including adhesive residue.
   2. **Leave factory finish surfaces clean and free of paint.**

3.6 PROTECTION

A. Protection: Protect work of other trades, whether being coated or not, against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as acceptable to Architect.

B. Fresh Coatings: Provide “Wet Paint” signs to protect newly coated finishes. Remove temporary protective wrappings provided by others to protect their work after completing coating operations.

C. Touch-Up: At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

END OF SECTION

DIVISION 10

SPECIALTIES

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SECTION 10 1400
SIGNAGE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Plaques.

1.3 RELATED REQUIREMENTS

A. Division 01 "Product Substitution Procedures".

B. Division 01 "Temporary Facilities and Controls" for temporary Project identification signs and for temporary information and directional signs.

C. Division 23 "Identification for Plumbing and Equipment" for labels, tags, and nameplates for mechanical equipment.

D. Division 26 "Identification for Electrical Systems" for labels, tags, and nameplates for electrical equipment.

1.4 REFERENCE STANDARDS

A. Americans with Disabilities Act (ADA) - Standards for Accessible Design; 2010.

B. AAMA 611 (American Architectural Manufacturers Association) - Voluntary Specification for Anodized Architectural Aluminum; 2014.

C. AAMA 2603 (American Architectural Manufacturers Association) - Voluntary Specification for Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels; latest edition.

D. ICC/ANSI A117.1 - Standard for Accessible and Usable Buildings and Facilities; 2009.

E. ASTM B26 (ASTM B26M) - Standard Specification for Aluminum-Alloy Sand Castings; 2014e1.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

G. NAAMM - Metal Finishes Manual for Architectural and Metal Products; current edition.

1.5 SUBMITTALS

A. General: The following submittal package shall be submitted as a complete package, including the following listed below. Individual submittals will be returned unaccepted until the complete package is submitted.

B. Product Data: For each type of product indicated.

C. Shop Drawings: Show fabrication and installation details for signs.
   1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
   2. Provide message list, type styles, graphic elements, including tactile characters and Braille, and layout for each sign.

D. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:
   1. Aluminum.

E. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:
   1. Plaque Casting: 6 inches (150 mm) square including border.
   2. Aluminum: For each form, finish, and color, on 6-inch- (150-mm-) long sections of extrusions and squares of sheet at least 4 by 4 inches (100 by 100 mm).

F. Sign Schedule: Use same designations indicated on Drawings.

G. Qualification Data: For the Installer and fabricator.

H. Warranty: Special warranty specified in this Section.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

C. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

D. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.8 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit installation of signs in exterior locations to be performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify recess openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.9 COORDINATION

A. Coordinate placement of anchorage devices with templates for installing signs.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Deterioration of metal and polymer finishes beyond normal weathering.
      b. Deterioration of embedded graphic image colors and sign lamination.
   2. Warranty Period: Five years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

A. Aluminum Castings: ASTM B 26/B 26M, of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated.

2.2 PLAQUES

A. General: Cast aluminum, stroke-sanded face w/ baked enamel background. Clear-coated w/ acrylic polyurethane. Size: 24 by 36 inches with up to 400 characters and three logos or seals. Location, font, border, text and artwork to be selected.
   1. Flat Surface Mounting: concealed fastener mounting using threaded studs secured into wall with adhesive. Provide blocking in wall as required.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. A.R.K. Ramos (Basis of Design)
   2. Gemini Incorporated

C. Cast Plaques: Provide castings free of pits, scale, sand holes, and other defects, as follows:
   1. Plaque Type **(BP1)**:
      a. Plaque Size: 24 X 36 inch (607 X 914 mm).
      b. Plaque Material: Aluminum.
      c. Background Texture: Architect to select from manufacturer's standard textures.

d. Border Style: 1/4 inch (6 mm) raised, smooth finish (different texture and color than background).
e. Mounting: Concealed studs, non-corroding for substrates encountered.
f. Thickness: 0.250 inch (6.35 mm) thick.
g. Character Size: To be selected by Architect from manufacturer's full range of fonts.
h. Number of Characters: Approximately 400.
i. Character Finish/Color: Architect to select from manufacturer's standard colors.
j. Text/Message:
   1) Graphics: Image of the seal of St. John the Baptist Parish.
   2) Text:
      (a) Name of the Project (per St. John the Baptist Parish).
      (b) Year facility was completed.
      (c) Name of the Architect.
      (d) Name of the Contractor.
      (e) Parish President and Name.
      (f) Seven Parish Council Members, their Names, and their Districts.
k. Location: As indicated on the drawings.
l. Quantity: One.

2.3 ACCESSORIES

A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors for all sizes greater than 12 by 12 inches (304.8 by 304.8 mm). Furnish inserts, as required, to be set into concrete or masonry work.

2.4 FABRICATION

A. General: Provide manufacturer's standard signs of configurations indicated. Comply with requirements indicated for material, thicknesses, finishes, colors, designs, shapes, sizes and details of construction.
   1. Welded Connections: Comply with AWS standards for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded surfaces of welding flux and dress exposed and contact surfaces.
   2. Mill joints to tight, hairline fit. Form joints exposed to weather to exclude water penetration.
   3. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.
   4. Conceal fasteners if possible; otherwise, locate fasteners where they will be inconspicuous.
   5. Form panels to required size and shape.

6. Coordinate dimensions and attachment methods to produce message panels with closely fitting joints. Align edges and surfaces with one another in the relationship indicated.

2.5 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 ALUMINUM FINISHES

A. At Exterior Plaques.
   1. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.
      a. Organic Coating: Thermosetting, modified-acrylic enamel primer/topcoat system complying with AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm), medium gloss.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Verify that items, including anchor inserts, are sized and located to accommodate signs.

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

3.2 INSTALLATION

A. Locate signs and accessories where indicated on drawings and as scheduled, using mounting methods of types described and complying with manufacturer's written instructions.
   1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.

B. Cast-Metal Plaques: Mount plaques using standard fastening methods to comply with manufacturer's written instructions for type of wall surface indicated.
   1. Concealed Mounting: Mount plaques by inserting threaded studs into tapped lugs on back of plaque. Set in predrilled holes filled with quick-setting cement.

3.3 CLEANING AND PROTECTION

A. Repair scratches and other damage which might have occurred during installation. Replace components where repairs were made but are still visible from a distance of 5 feet.

B. Remove temporary coverings and protection to adjacent work areas.

C. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION

SECTION 10 2113.16
PLASTIC-LAMINATE-CLAD TOILET COMPARTMENTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Plastic laminate toilet compartments.

1.3 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Blocking and supports.

1.4 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2009.

B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

C. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.6 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.

C. Product Data: Provide data on panel construction, hardware, and accessories.

D. Samples: Submit two samples of partition panels, 12 x 12 inch (305 x 305 mm), minimum, in size illustrating panel finish, color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Plastic Laminate Toilet Compartments:
   1. Global Steel Products Corp: www.globalpartitions.com.
   2. Bobrick; Product 1540 Series: www.bobrick.com.
   3. Substitutions: Section 01 6000 - Product Requirements.

2.2 MATERIALS

A. Particleboard for Core: ANSI A208.1; composed of wood chips, sawdust or flakes, made with waterproof resin binder; of grade to suit application; sanded faces.

B. Plastic Laminate: NEMA LD 3, HGS.

C. Adhesive: Manufacturer's standard type.

2.3 COMPONENTS

A. Toilet Compartments: Plastic laminate finished, floor-mounted unbraced.

B. Doors, Panels, and Pilasters: Plastic laminate adhesive and pressure bonded to faces and edges of particleboard core, with beveled corners and edges; edges of cut-outs sealed.
   1. Reinforce pilasters and panels with steel plate sandwiched in particleboard core at attachment points. Router cut openings as required.
   2. Plastic Laminate Color: to be selected by Architect from manufacturer's full range, textured, low gloss finish.

C. Door and Panel Dimensions:
   1. Thickness: 1 inch (25 mm).
   2. Door Width: 24 inch (610 mm).
   3. Door Width for Handicapped Use: 36 inch (915 mm), out-swinging.
   4. Height: 58 inch (1 473 mm).
   5. Thickness of Pilasters: 1 inch (25 mm), minimum.

2.4 ACCESSORIES

A. Pilaster Shoes: Formed ASTM A666, Type 304 stainless steel with satin finish, 4 inches (102 mm) high, minimum, concealing floor fastenings.
   1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Head Rails: Hollow anodized aluminum tube, 1 x 1-5/8 inch (25 x 41 mm) size, with cast socket wall brackets.

C. Wall and Pilaster Brackets: Satin stainless steel.

D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.

1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.

E. Steel Plate Reinforcement: Carbon steel, prepared for fasteners, 1/8 inch (3 mm) thick.

F. Hardware: Satin stainless steel:
   1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
   2. Nylon bearings.
   3. Thumb turn door latch with exterior emergency access feature.
   4. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
   5. Coat hook with rubber bumper; one per compartment, mounted on door.
   6. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.2 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 to 1/2 inch (9 to 13 mm) space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.3 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch (6 mm).

B. Maximum Variation From Plumb: 1/8 inch (3 mm).

3.4 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).

B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10 2829
UNDERSINK LAVATORY PIPE INSULATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes ADA-compliant, under-sink protective lavatory pipe insulation for “accessible” lavatories to prevent burns.

B. Related Sections include:
   1. Division 01 "Product Substitution Procedures".
   2. Division 23 Mechanical Sections: Lavatories, piping, and pipe insulation (for applications other than accessible lavatory exposed pipes).

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product specifications and application recommendations for type of insulation product proposed.

1.4 QUALITY ASSURANCE

A. Fire Performance Characteristics: Provide insulation materials, which are self-extinguishing within 5 seconds with average 10 mm. extent of burning per the ASTM D 635 test method.

B. Single-Source Responsibility: Obtain lavatory pipe insulation from a single source to provide products of consistent appearance and physical properties.

C. ADA Compliance: Pipe insulation shall comply with applicable requirements of the American Disabilities Act.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protection: Protect insulation from physical damage and deterioration. Store inside and in a dry location. Comply with manufacturer's recommendations for handling, storage, and protection during installation.

PART 2 PRODUCTS

2.1 UNDERSINK LAVATORY PIPE INSULATION

A. Manufacturer: Subject to compliance with requirements, provide products by one of the following manufacturers:

1. “Handi Lav-Guard” insulation products of Truebro, Inc., Ellington, Connecticut; (203) 875-2868.
2. "Pro-Extreme" molded insulated PVC covers by Plumberex Specialty Products, Inc., Palm Springs, California; (800) 475-8269.

B. Description: Universal assemblies for installation on standard plumbing piping assemblies, consisting of molded closed cell vinyl with the following characteristics:
1. Nominal Wall Thickness: 3/16 inch.
2. Hardness: 55 to 65 Shore A durometer.
3. Ultra Violet Protection: Integral barrier.
4. Color: Manufacturer's standard paintable white or gray integral color, as selected by the Architect.
5. Thermal Conductivity: k = 1.17.

C. Configuration: Provide manufacturer's standard insulation kit for the following components; coordinate with Division 15 for piping configuration:
1. P-trap assembly, cast brass or tubular, 1-1/4-inch or 1-1/2-inch diameter.
2. 1-1/4-inch or 1-1/2-inch diameter tailpiece.
3. Hot water angle valve assembly, 3/8-inch or 1/2-inch size.
4. Cold water angle valve assembly, 3/8-inch or 1/2-inch size.
5. Offset wheelchair strainer assembly (McGuire).

D. Fasteners: Provide manufacturer-furnished or -recommended fasteners for securing the insulating assemblies in position.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Examining: Examine substrates and conditions 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 piping is complete and tested, pipe escutcheons are secured in position, other finishing work in space is complete and unsatisfactory conditions have been corrected.

B. Preparing: Clean substrates of substances harmful to insulations including removal of projections and foreign materials.

3.2 INSTALLATION

A. General: 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. Application: Extend insulation full thickness as indicated to envelop entire piping assembly to be insulated. Cut and fit as necessary to fully cover as-installed piping. Secure installed insulation as recommended by the insulation manufacturer.

3.3 COMPLETION

A. Insulation: Completed application shall form a continuous insulating barrier without gaps. Each insulating component shall be secured against dislodgement incidental to use of the lavatory by wheelchair occupants or by cleaning personnel.

B. Protection: Protect installed insulation until acceptance from damage. Remove and replace with new material insulation components, which are damaged or defective.

END OF SECTION

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SECTION 10 4400
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Fire extinguishers.

B. Fire extinguisher cabinets.

C. Accessories.

1.3 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

B. Section 09 2116 - Gypsum Board Assemblies: Roughed-in wall openings.

C. Section 09 900 - Painting and Coating.

1.4 REFERENCE STANDARDS

A. NFPA 10 - Standard for Portable Fire Extinguishers; 2013.

B. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.

1.5 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, wall bracket mounted measurements, and location.

C. Product Data: Provide extinguisher operational features, color and finish, and anchorage details.
   1. Fire Extinguishers: Include rating and classification.
   2. Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

D. Samples: Submit samples for verification purposes of each type of metal finish required, prepared on metal samples of same thickness and alloy indicated for final unit of Work. Where finishes involve normal color and texture variations, include sample sets showing full range of variations expected.

E. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.6 QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, “Standard for Portable Fire Extinguishers”.

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

C. Single-Source Responsibility: Obtain fire extinguishers and cabinets from one source from a single manufacturer.

D. ADAAG Compliance: Comply with ADAAG on maximum cabinet projection of 4" in corridors where necessary.

1.7 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fails in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Failure of hydrostatic test according to NFPA 10.
      b. Faulty operation of valves or release levers.
   2. Warranty Period: Six years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Fire Extinguishers:
   1. Larsen: www.larsensmfg.com. **BASIS OF DESIGN.**
   2. J.L Industries, Inc: www.jlindustries.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Fire Extinguisher Cabinets and Accessories:
   1. JL Industries, Inc: www.jlindustries.com.
   2. Larsen's Manufacturing Co: www.larsensmfg.com. **BASIS OF DESIGN.**
   3. Substitutions: See Section 01 6300 – Substitution Procedures.

2.2 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL for the purpose specified and indicated.

B. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
   1. Manufacturers:
      a. Larsen; MP Series, Model MP5-A. **BASIS OF DESIGN.**
      b. J.L Industries, Inc; Model Cosmic 5E.
   2. Characteristics:
      a. Stored Pressure Operated: Deep Drawn.
      b. Class: 3A;40B:C.
      c. Size/Capacity: 5 pound (2.27 kg).
      d. Finish: Baked polyester powder coat, color as selected by Architect from manufacturer's full range.

2.3 FIRE EXTINGUISHER CABINETS

A. Manufacturers:
   1. Larsen's Manufacturing Co; Architectural Series, Model No. 2409-R3. **BASIS OF DESIGN.**
   2. JL Industries, Inc; Ambassador Series, Model No. 8117.

B. Metal: Formed primed steel sheet; 0.036 inch (0.9 mm) thick base metal.

C. Cabinet Configuration: Semi-recessed type.
   1. Inside Box nominal dimensions of 9-1/2 inch (241 mm) wide x 24 inch (610 mm) high x 5 inch (127 mm) deep.
   2. Outside Trim Dimensions: 27-1/2 high by 13 wide inch (699 high by 330 wide mm)
   3. Rough Opening Dimensions: 25 high by 10-1/2 wide by 3 deep inch (635 high by 267 wide by 76 deep mm).
   4. Trim: Returned to wall surface, with 2-1/2 inch (64 mm) projection. All corners mitered.
   5. Tub: Manufacturer's standard cold-rolled heavy gage steel box, 3/4-inch flange, white baked enamel interior finish.

D. Door Material: Steel.

E. Door Type: Solid.

F. Door: 0.036 inch (0.9 mm) thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with continuous piano hinge. Provide nylon catch.

G. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.

H. Weld, fill, and grind components smooth.

I. Finish of Cabinet Exterior Trim and Door: Baked enamel, color as selected by Architect from manufacturer's full range.

J. Finish of Cabinet Interior: White enamel.

2.4 ACCESSORIES

A. Extinguisher Brackets: Formed steel, galvanized and enamel finished.
   1. **FEB-1**: Provide brackets designed to prevent accidental dislodgement of extinguisher, of sizes required for type and capacity of extinguisher indicated. Subject to compliance with requirements, provide one of the following:
      a. LARSEN; Standard Bracket- 1521. **BASIS OF DESIGN**.
      b. J. L. Industries, Inc.; Standard Bracket- J-Hook
      c. Finish: Manufacturer's standard baked enamel.
      d. Location of Use: Provide brackets for each extinguisher not located in an extinguisher cabinet.
      e. Identify extinguisher locations with red lettering "FIRE EXTINGUISHER" applied to mounting surface. Letter size, style, and location as selected by the Architect.

B. Cabinet Signage: "FIRE EXTINGUISHER".
   1. Lettering in color as selected by Architect from manufacturer's full range.
   2. Lettering to be manufacturer's standard "Type A" die-cut lettering as selected by Architect from manufacturer's full range of styles, fonts, colors and orientation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install items in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.

C. Secure rigidly in place.

D. Place extinguishers and accessories in cabinets and on wall brackets.

E. Bracket-Mounted Extinguishers: Where exact location of bracket mounted fire extinguishers is not indicated, locate as directed by Architect.

3.3 COMPLETION

A. Extinguishers: Keep extinguishers in locked storage until just prior to inspection for acceptance; obtain signed receipt from Owner's representative and place extinguishers in designated locations, unless instructed to maintain in storage.
   1. Verify that certification tags are attached to each extinguisher.
   2. Replace or recharge, and recertify, extinguishers that were discharged during construction period, either accidentally or in an emergency.

B. Cabinets: All cabinets shall be properly located and rigidly secured, plumb and level. Clean exposed surfaces inside and outside. Remove and replace items, which are damaged and defective and which cannot be acceptably repaired.

C. Other Work: Clean and repair other surfaces damaged, soiled or marred by work of this Section; remove and replace items which cannot be acceptably cleaned or repaired.

3.4 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 final protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION

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DIVISION 12

FURNISHINGS

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SECTION 12 3600
COUNTERTOPS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Countertops for architectural cabinet work.

B. Countertops for manufactured casework.

1.3 RELATED REQUIREMENTS

A. Section 06 4100 - Architectural Wood Casework.

B. Section 22 4000 - Plumbing Fixtures: Sinks.

1.4 REFERENCE STANDARDS

A. ANSI A161.2 - Performance Standards for Fabricated High Pressure Decorative Laminate Countertops; 1998.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

C. AWI (QCP) - Quality Certification Program, www.awiqcp.org; current edition at www.awiqcp.org.

D. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

E. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; International Surface Fabricators Association; 2013.

F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

G. PS 1 - Structural Plywood; 2009.

1.5 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

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. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

G. Installation Instructions: Manufacturer's installation instructions and recommendations.

H. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.

B. Quality Certification: Provide AWI Quality Certification Program (QCP) inspection report and quality certification of completed work.
   1. Provide labels or certificates indicating that the work complies with requirements of AWI/AWMAC/WI (AWS) grade or grades specified.
   2. Prior to delivery to the site provide shop drawings with certification labels.
   3. Provide labels on each product when required by certification program.
   4. Upon completion of installation provide certificate certifying that the installation and products meet the specified requirements.
   5. Arrange and pay for inspections required for certification.
   6. Replace, repair, or rework all work for which certification is refused.

C. Installer Qualifications: Fabricator.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 COUNTERTOP ASSEMBLIES

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS).

B. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
   1. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3, Grade HGS, 0.048 inch (HGS, 1.2 mm) nominal thickness.
      a. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E84.
      b. NSF approved for food contact.
      c. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
      d. Laminate Core Color: Same as decorative surface.
      e. Finish: As indicated on drawings.
      f. Surface Color and Pattern: As indicated on drawings.
      g. Manufacturers:
         1) **BASIS OF DESIGN:**
            (a) Type PL-4: Formica Corporation: www.formica.com.
            (b) Type PL-3: Lamin-Art, Inc: www.laminart.com.
            (c) Substitutions: See Section 01 6000 - Product Requirements.
               (1) Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.
               (2) Color/finish by alternate or Architect approved manufacturer will be selected by Architect from manufacturer's full range.
   2. Back and End Splashes: Same material, same construction.
   3. Fabricate in accordance with AWI/AWMAC/WI (AWS), Section 11 - Countertops, Custom Grade.

C. Type **SS-1,** Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Flat Sheet Thickness: 1/2 inch (12 mm), minimum.
   2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E84.
      b. NSF approved for food contact.
      c. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
      d. Color and Pattern: As indicated on drawings.
      e. Manufacturers:

1) **BASIS OF DESIGN:**
   (a) Dupont; Corian Solid Surfaces: www.corian.com.
2) Substitutions: See Section 01 6000 - Product Requirements.
   (a) Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.
   (b) Color/finish by alternate or Architect approved manufacturer will be selected by Architect from manufacturer's full range.

3. Other Components Thickness: 1/2 inch (12 mm), minimum.
4. Exposed Edge Treatment: As indicated on drawings.
5. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.
6. Fabricate in accordance with AWI/AWMAC/WI (AWS), Section 11 - Countertops, Custom Grade.

2.2 ACCESSORY MATERIALS

A. Wood-Based Components:
   1. Wood fabricated from old growth timber is not permitted.
   2. Provide wood harvested within a 500 mile (805 km) radius of the project site.

B. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch (19 mm) thick; join lengths using metal splines.

C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

D. Joint Sealant: Mildew-resistant silicone sealant, white.

2.3 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches (102 mm), unless otherwise indicated.

C. Solid Surfacing: Fabricate tops up to 144 inches (3657 mm) long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch (16 mm).

C. Seal joint between back/end splashes and vertical surfaces.

3.4 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet (3 mm in 3 m), maximum.

B. Offset From Wall, Countertops: 1/8 inch (3 mm) maximum; 1/16 inch (1.5 mm) minimum.

C. Field Joints: 1/8 inch (3 mm) wide, maximum.

3.5 CLEANING

A. Clean countertops surfaces thoroughly.

3.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

DIVISION 13

SPECIAL CONSTRUCTION

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SECTION 13 3419
METAL BUILDING SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Manufacturer-engineered, shop-fabricated structural steel building frame.
   1. Building components specified herein include, but are not limited to, structural framing, framed openings, miscellaneous steel at door/window openings, flashing, bracing, fasteners, and accessories as indicated, specified or required.

B. Accessories.

1.3 RELATED REQUIREMENTS

A. Section 01 4529 - Testing Laboratory Services.

B. Section 03 3000 - Cast-in-Place concrete.

C. Section 05 1200 - Structural Steel Framing.

D. Section 05 4000 - Cold-Formed Metal Framing.

E. Section 07 4113 - Metal Roof Panels.

F. Section 07 9513 - Expansion Joint Cover Assemblies.

G. Section 08 1113 - Hollow Metal Doors and Frames.

H. Section 08 4313 - Aluminum-Framed Storefronts. For aluminum window systems.

I. Division 23 - Heating, Ventilating, and Air Conditioning (HVAC).

J. Division 26 - Electrical.

1.4 REFERENCE STANDARDS

A. AISC 360 - Specification for Structural Steel Buildings; American Institute of Steel Construction, Inc.; 2010.

B. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2012.

C. ASTM A490M - Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric); 2012

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

E. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011.

F. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.

H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.

I. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010 w/Errata.

J. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2012.

K. MBMA (MBSM) - Metal Building Systems Manual; Metal Building Manufacturers Association; 2012.

L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

M. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.5 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in standards referenced by this Section.

1.6 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-rod inserts into foundation walls and footings. Anchor rod installation, concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."

1.7 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meeting: Convene two weeks before starting work of this section.
   1. Conduct at Project Site.

2. Attendants to include Contractor, Owner's representative, Architect, metal building manufacturer's representative, erector, and those contractors affected by this scope of work.
3. Review methods and procedures related to metal building systems including, but not limited to, the following:
   a. Condition of foundations and other preparatory work performed by other trades.
   b. Structural load limitations.
   c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
   d. Required tests, inspections, and certifications.
   e. Unfavorable weather and forecasted weather conditions and impact on construction schedule.
4. Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:
   a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
   b. Structural limitations of purlins and rafters during and after roofing.
   c. Roof observation and repair after metal roof panel installation.
5. Review methods and procedures related to wall assemblies including, but not limited to, the following:
   a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.

1.8 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for each type of metal building system component.

C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections, attachments, openings, cambers, loads, and anchors; general construction details, anchorages and method of anchorage, installation, and coordinated/detailed opening conditions; framing anchor bolt settings, sizes, and locations from datum, foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature by a professional structural engineer currently licensed in the State of Louisiana.
   1. Indicate components by others. Include full building plan, elevations, sections, details and the following:
      a. Anchor-Rod Plans: Submit anchor-rod plans and templates before foundation work begins. Include location, diameter, and minimum required projection of anchor rods required to attach metal building to foundation. Indicate column reactions at each location.
      b. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.

D. Delegated-Design Submittal: For metal building systems.
   1. Include analysis data indicating compliance with performance requirements and design data signed and sealed by the qualified professional engineer responsible for their preparation licensed in the State of Louisiana.

E. Qualification Data: For manufacturer and erctor.

F. Welding certificates.

G. Letter of Design Certification: Signed and sealed by a qualified professional engineer licensed by the State of Louisiana. Include the following:
   1. Name and location of Project.
   2. Order number.
   3. Name of manufacturer.
   4. Name of Contractor.
   5. Building dimensions including width, length, height, and roof slope.
   6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
   7. Governing building code and year of edition.
   8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
   9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
   10. Building-Use Category: Indicate category of building use and its effect on load importance factors.

H. Erector Certificates: For qualified erector, from manufacturer.

I. Material Test Reports: For each of the following products:
   1. Structural steel including chemical and physical properties.
   2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
   3. Tension-control, high-strength, bolt-nut-washer assemblies.
   4. Shop primers.
   5. Nonshrink grout.

J. Source quality-control reports.

K. Sample Warranties: For special warranties.

L. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.

M. Manufacturer Qualification Statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472.
   1. Include statement that manufacturer designs and fabricates metal building system as integrated components and assemblies, including but not limited to primary structural members, secondary members, joints, roof, and wall cladding

components specifically designed to support and transfer loads and properly assembled components form a complete or partial building shell.

1.9 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

1.10 QUALITY ASSURANCE

A. Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this Work.
   1. Design Engineer Qualifications: Licensed in LOUISIANA.
      a. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction.
   2. Conform to applicable code for submission of design calculations as required for acquiring permits.
   3. Cooperate with regulatory agency or authority and provide data as requested.

B. Perform work in accordance with AISC 360 and MBMA (MBSM).
   1. Maintain one copy on site.

C. Perform welding in accordance with AWS D1.1/D1.1M, "Structural Welding Code-Steel", and AWS D1.3, "Structural Welding Code- Sheet Steel".
   1. Procedures and personnel qualified for each.

D. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.
   1. Not less than ten years of documented experience.
   2. Accredited by IAS in accordance with IAS AC472.
      a. Facility accredited according to "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."

E. Erector Qualifications: Company specializing in performing the work of this section with minimum ten years experience.
   1. Experienced and specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

1.12 FIELD CONDITIONS

A. Weather Limitations: Proceed with panel installation only when weather conditions permit metal panels to be installed according to manufacturer's written instructions and warranty requirements.

1.13 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty for Metal Building System integrity.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Metal Buildings:
   1. Butler Manufacturing Company: www.butlermfg.com.
   2. Ceco Building Systems: www.cecobuildings.com.
   3. Kirby Building Systems: www.kirbybuildingsystems.com.
   4. Metallic Building Company: www.metallic.com.
   5. Nucor Building Systems: www.nucorbuildingsystems.com. **BASIS OF DESIGN.**
   6. VP Buildings: www.vp.com.
   7. Substitutions: See Section 01 6000 - Product Requirements.

B. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

2.2 METAL BUILDING

A. Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.

B. Primary-Frame Types:
   1. Warehouse Building: Rigid Frame, Clear Span, Gable (RCG). Without interior columns.

C. Bay Spacing: As indicated on drawings.

D. Primary Framing: Rigid frame of rafter beams and columns, end wall columns, and wind bracing.

E. End-Wall Framing:
   1. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of load-bearing end-wall and corner columns and rafters.

F. Secondary Framing: Purlins, Eave struts, Flange bracing, Sill supports, and Clips, and other items detailed.

G. Eave Height: As indicated on Drawings.

H. Roof Slope: As indicated on drawings.

2.3 MATERIALS - FRAMING

A. General:
   1. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."
   2. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
   3. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.
   4. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
      a. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
         1) Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.
      b. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
      c. Frame Configuration: Single gable. Refer to Drawings.
      d. Exterior Column: Tapered.
      e. Rafter: Uniform depth.
   5. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:
      a. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
      b. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.
   6. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips,

headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:

a. Purlins: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum 2-1/2-inch- (64-mm-) wide flanges.
   1) Depth: As needed to comply with system performance requirements.
b. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; to provide adequate backup for metal panels.
c. Flange Bracing: Minimum 2-by-2-by-1/8-inch (51-by-51-by-3-mm) structural-steel angles or 1-inch- (25-mm-) diameter, cold-formed structural tubing to stiffen primary-frame flanges.
d. Sag Bracing: Minimum 1-by-1-by-1/8-inch (25-by-25-by-3-mm) structural-steel angles.
e. Base or Sill Angles: Manufacturer's standard base angle, minimum 3-by-2-inch (76-by-51-mm), fabricated from zinc-coated (galvanized) steel sheet.
f. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
g. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
h. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

7. Bracing: Provide adjustable wind bracing using method indicated on structural drawings:
   a. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.

B. Structural Steel Members: ASTM A572/A572M, Grade 50.
   1. W-Shapes.
   2. Channels, Angles, M-Shapes and S-Shapes.

C. Structural Tubing: ASTM A500/A500M, Grade B cold-formed.

D. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M.

E. Plate or Bar Stock: ASTM A529/A529M, Grade 50.

F. Anchor Bolts: ASTM A307, galvanized to ASTM A153/A153M.

G. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 (ASTM A 563M) carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.

1. Finish: Hot-dipped zinc coating, ASTM F 2329, Class C.

H. Structural Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.
   1. Finish: Hot-dipped zinc coating, ASTM F 2329, Class C.

I. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers, plain.

J. Welding Materials: Type required for materials being welded.

K. Primer: SSPC-Paint 20, zinc rich.
   1. Factory primed. Apply specified primer immediately after cleaning and pretreating.
      a. Clean and prepare in accordance with SSPC-SP2.
      b. Coat with manufacturer's standard primer. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil (0.025 mm).
         1) Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil (0.013 mm) on each side.
   2. Finish: Red-Oxide Primer.
      a. Unless noted otherwise.

L. Grout: ASTM C1107/C1107M, Non-shrink type, premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents, capable of developing minimum compressive strength of 2400 psi (17 MPa) in two days and 7000 psi (48 MPa) in 28 days.

2.4 ACCESSORY COMPONENTS

A. Doors and Frames: Specified in Section 08 1113.

B. Aluminum-Framed Storefronts: Specified in Section 08 4313.
   1. Exterior Window System.

2.5 DESIGN CRITERIA

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal building system.

B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."
   1. Design Loads: As indicated on Drawings.
   2. Deflection and Drift Limits: Design metal building system assemblies to withstand serviceability design loads without exceeding deflections and drift limits recommended in AISC Steel Design Guide No. 3 "Serviceability Design Considerations for Steel Buildings."
   3. Deflection and Drift Limits: No greater than the following:

a. Purlins and Rafters: Vertical deflection of 1/360 of the span.
b. Wall System: Vertical deflection of 1/360 of the span.
c. Wall System: Horizontal deflection of 1/240 of the span.
d. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
e. Lateral Drift: Maximum of 1/400 of the building height.

C. Design members to withstand dead load, applicable snow load, and design loads due to pressure and suction of wind calculated in accordance with IBC 2012 code.

D. Seismic Performance: Metal building system shall withstand the effects of earthquake motions determined according to Structural Drawings.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

F. Structural Performance for Metal Roof Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
1. Wind Loads: As indicated on Drawings.

G. **Design members to withstand UL 580 Uplift Class 90.**

H. Exterior wall and roof system shall withstand imposed loads with maximum allowable deflection of L/360 of span.

I. Provide drainage to exterior for water entering or condensation occurring within wall or roof system.

J. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of 120 degrees F (67 degrees C), ambient; 180 degrees F (100 degrees C), material surfaces.
1. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

2.6 FABRICATION - FRAMING

A. General: Design components and field connections required for erection to permit easy assembly.
1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Fabricate members in accordance with AISC 360 for plate, bar, tube, or rolled structural shapes.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
   1. Make shop connections by welding or by using high-strength bolts.
   2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
   3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
   4. Weld clips to frames for attaching secondary framing if applicable, or punch for bolts.
   5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
   1. Make shop connections by welding or by using non-high-strength bolts.

E. Anchor Bolts: Formed with bent shank, assembled with template for casting into concrete.

F. Provide wall opening framing for doors, windows, and other accessory components as indicated on drawings and as required for a complete and compliant installation.

2.7 FINISHES

A. Framing Members: Clean, prepare, and shop prime. Do not prime surfaces to be field welded.
   1. Paint exposed framing members as indicated on drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position.
   1. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

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

3.2 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION - FRAMING

A. Erect framing in accordance with AISC 360.
   1. In addition to manufacturer's written instructions and drawings.

B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.

C. Set column base plates with non-shrink grout to achieve full plate bearing.
   1. Clean concrete-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
      a. Set plates for structural members on wedges, shims, or setting nuts as required.
      b. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
      c. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

D. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

E. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

F. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

G. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
   1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.
      a. Joint Type: Snug tightened or pretensioned as required by manufacturer.

H. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
   1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
   2. Locate and space wall girts to suit openings such as doors and windows.
   3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

I. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
   1. Tighten rod and cable bracing to avoid sag.
   2. Locate interior end-bay bracing only where indicated.

J. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

K. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

L. After erection, prime welds, abrasions, and surfaces not shop primed.

3.4 INSTALLATION - ACCESSORY COMPONENTS IN WALL SYSTEM

A. Coordinate installation of accessory components as indicated on drawings or as referenced in related specification sections.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform the following tests and inspections and to submit reports.

C. Tests and Inspections:
   1. High-Strength, Field-Bolted Connections: Connections shall be tested and inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
   2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1.

D. Product will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.6 TOLERANCES

A. Framing Members: 1/4 inch (6 mm) from level; 1/8 inch (3 mm) from plumb.

3.7 CLEANING AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

B. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
   1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
   2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

END OF SECTION

DIVISION 22

PLUMBING

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SECTION 22 0529
PIPE HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 PROVISIONS

A. Requirements of Section 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition.

1.2 DESCRIPTIONS

A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.

B. The work described in this section of the specifications includes but is not limited to the following:
   1. Pipe hangers for various types of pipe installed as set forth in this section and related sections.
   2. All intermediate support steel attached to building structure for piping systems as necessary for support of all piping systems.

C. Piping shall be isolated from hanger material supports and different piping material shall be suitably isolated to prevent galvanic corrosion or deterioration resulting from contact of dissimilar metals.

1.3 RELATED WORK

A. The following items of related work are specified and included in other sections of these operations from contact of dissimilar metals:
   1. Section 23 0516 - Piping and Fittings
   2. Section 23 0719 - Mechanical System Insulation

1.4 SUBMITTALS

A. Submit seven copies of manufacturer's product data for review by the Engineer.

PART 2 - PRODUCTS

2.1 APPLICABLE PUBLICATION

A. Manufacturers Standardization Society (MSS) of the Valve and Fitting Industry, Inc. Publication are referenced in the text by the basic designation only.
   1. SP-58-93: Pipe Hangers and Supports - Materials, Design and Manufacturer.
   2. SP-69-91: Pipe Hangers and Supports - Selection and Application.

2.2 HANGERS

A. Pipe hangers and supports. Adjustable clevis hangers for:
   1. Non-insulated pipe 2" through 24" diameter.

B. Pipe hangers and supports. Adjustable wrought clevis hangers, with SP-58, MSS Type 40 galvanized insulation protection shields (sized for supporting insulation having a compressive strength of 4 psi, at 8 foot intervals). Support piping on outside of insulation. Size hangers so that pipe insulation passes through them without interruption. Use these for:
   1. Insulated steel pipe 1/2" through 24" diameter.
   2. Insulated copper pipe 1/2" through 8" O.D.

C. MSS SP-58 Type 6, with adjustable swivel ring, split ring type for:
   1. Non-insulated steel pipe, copper pipe 1/2" through 1-1/2" diameter.

D. MSS SP-58 Type 9, with adjustable wrought tubing ring hanger, either plastic covered or copper plated for non-insulated copper tubing with no longitudinal movement.

E. MSS SP-58 Type 41 with pipe roller and MSS SP-58 Type 40 galvanized insulation protection shields (sized for supporting insulation having a compressive strength of 4 psi, at 8 foot intervals). Support piping on outside of insulation. Size hangers so that pipe insulation passes through them without interruption. Use these for:
   1. Insulated copper pipe, 1/2" through 2" diameter, having longitudinal movement.
   2. Insulated steel pipe, 1" through 30" diameter, having longitudinal movement.

F. MSS SP-58 Type 8, riser clamps (at floor slab penetrations) to support copper pipe risers.

G. MSS SP-58 Type 8, riser clamps (at floor slab penetrations) to support steel pipe risers.

H. Where three or more lines of pipe run parallel, support them with trapeze hangers.

PART 3 - EXECUTION

3.1 PIPE HANGERS

A. Support pipes on specified hangers so that equipment, pumps, and fittings do not bear weight of pipe.
   1. Support pipe risers at regular intervals in pipe shafts in accordance with good practice.
   2. Do not use perforated metal, strap iron, or band iron.

3. Do not make offsets in hangers.

B. Maximum allowable spacing of pipe hangers is listed below. Space hangers and brackets at close intervals where necessary to maintain levels, slopes, and drainage, or to prevent sagging.

C. Steel Pipe:
1. 1/4" to 3/4" - 6'-0" o.c.
2. 1" to 12" - 10'-0" o.c.
3. 3/8 to 1 ¼" - 7'-0" o.c.
4. 1 ½ to 2" - 9'-0" o.c.
5. 2 ½ to 3" - 11' -0" o.c.
6. 4" - 14'-0" o.c.
7. 5" to 6" - 16'-0" o.c.
8. 8" - 19'-0" o.c.
9. 10" - 22"-0"o.c.

D. Copper Pipe:
1. 1/2" to 3/4" - 5'-0" o.c.
2. 1" to 1-1/4" - 6'-0" o.c.
3. 1 ½" to 2" - 8'-0" o.c.
4. 2 ½ - 9'-0" o.c.
5. 3" - 10'-0" o.c.
6. 4" - 12'-0" o.c.
7. 6" - 14'-0" o.c.
8. 8" - 16'-0" o.c.

END OF SECTION

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SECTION 22 0553
MECHANICAL IDENTIFICATION

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the following mechanical identification materials and their installation:
   1. Equipment nameplates.
   2. Equipment markers.
   3. Equipment signs.
   4. Access panel and door markers.
   5. Pipe markers.
   6. Valve tags.

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

A. ASME Compliance: Comply with ASME A13.1, "Scheme for the Identification of Piping Systems," for letter size, length of color field, colors, and viewing angles of identification devices for piping.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Certain items in this Specification are listed by manufacturer and/or manufacturer's model number to establish general style, type, character and quality of the product desired. Similar items manufactured by other than those listed will be considered, providing submittals are made according to Pre-Bid Approval requirements of Instructions to Bidders.

B. Where no manufacturer or model number are given, any product meeting performance or design criteria, or referenced trade association standard may be used and Pre-Bid Approval is not required.

C. Manufacturers: Subject to compliance with requirements for complete systems provide products of one of the following:

2.2 EQUIPMENT IDENTIFICATION DEVICES

A. Equipment Nameplates: Stainless Steel, with data engraved or stamped, for permanent attachment on equipment.
   1. Data:
      a. Manufacturer, product name, model number, and serial number.
      b. Capacity, operating and power characteristics, and essential data.

c. Labels of tested compliances.
2. Location: Accessible and visible.
3. Fasteners: As required to mount on equipment.

B. Equipment Markers: Engraved, color-coded laminated plastic. Include contact-type, permanent adhesive.
1. Terminology: Match schedules as closely as possible.
2. Data:
a. Name and plan number.
b. Equipment service.
c. Design capacity.
d. Other design parameters such as pressure drop, entering and leaving conditions, and speed.
3. Size: 2-1/2 by 4 inches for control devices, dampers, and valves; 4-1/2 by 6 inches for equipment.

C. Equipment Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine subcore, unless otherwise indicated. Fabricate in sizes required for message. Provide holes for mechanical fastening.
1. Data: Instructions for operation of equipment and for safety procedures.
2. Engraving: Manufacturer's standard letter style, of sizes and with terms to match equipment identification.
3. Thickness: 1/8 inch, unless otherwise indicated.
4. Fasteners: Self-tapping, stainless-steel screws or contact-type, permanent adhesive.

D. Access Panel and Door Markers: 1/16-inch, engraved laminated plastic, with abbreviated terms and numbers corresponding to identification. Provide 1/8-inch center hole for attachment.
1. Fasteners: Self-tapping, stainless-steel screws or contact-type, permanent adhesive.

2.3 PIPING IDENTIFICATION DEVICES

A. Manufactured Pipe Markers, General: Preprinted, color-coded, with lettering indicating service, and showing direction of flow.
1. Colors: Comply with ASME A13.1, unless otherwise indicated.
2. Lettering: Use piping system terms indicated and abbreviate only as necessary for each application length
3. Pipes with OD, Including Insulation, Less Than 6 Inches: Full-band pipe markers extending 360° around pipe at each location.
4. Pipes with OD, Including Insulation, 6 Inches and Larger: Either full-band or strip-type pipe markers at least three times letter height and of length required for label.
5. Arrows: Integral with piping system service lettering to accommodate both directions; or as separate unit on each pipe marker to indicate direction of flow.

B. Pretensioned Pipe Markers: Precoiled semi rigid plastic formed to cover full circumference of pipe and to attach to pipe without adhesive.

C. Shaped Pipe Markers: Preformed semi rigid plastic formed to partially cover circumference of pipe and to attach to pipe with mechanical fasteners that do not penetrate insulation vapor barrier.

D. Self-Adhesive Pipe Markers: Plastic with pressure-sensitive, permanent-type, self-adhesive back.

E. Plastic Tape: Continuously printed, vinyl tape at least 3 mils thick with pressure-sensitive, permanent-type, self-adhesive back.
   1. Width for Markers on Pipes with OD, Including Insulation, Less Than 6 Inches: 3/4 inch minimum.
   2. Width for Markers on Pipes with OD, Including Insulation, 6 Inches or Larger: 1-1/2 inches minimum.

2.4 VALVE TAGS

A. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers, with numbering scheme. Provide 5/32-inch hole for fastener.
   1. Material: 0.032-inch- thick brass.
   2. Valve-Tag Fasteners: Brass wire-link or beaded chain

PART 3 EXECUTION

3.1 APPLICATIONS, GENERAL

A. Products specified are for applications referenced in other Division 23 Sections. If more than single-type material, device, or label is specified for listed applications, selection is Installer's option.

3.2 EQUIPMENT IDENTIFICATION

A. Install and permanently fasten equipment nameplates on each major item of mechanical equipment that does not have nameplate or has nameplate that is damaged or located where not easily visible. Locate nameplates where accessible and visible. Include nameplates for the following general categories of equipment:
   1. Fuel-burning units, including boilers, furnaces, heaters, and make up air units
   2. Pumps, compressors, chillers, condensers, and similar motor-driven units.
   3. Heat exchangers, coils, evaporators, cooling towers, heat recovery units, and similar equipment.
   4. Fans, blowers, air handling units primary balancing dampers, and mixing boxes.
   5. Packaged HVAC central-station and zone-type units.
   6. Split system D/X and packaged D/X equipment
   7. Variable air volume (VAV) boxes - tags should be located on the underside of the ceiling.

B. Install equipment markers with permanent adhesive on or near each major item of mechanical equipment. Data required for markers may be included on signs, and markers may be omitted if both are indicated.
   1. Letter Size: Minimum 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   2. Locate markers where accessible and visible.

C. Install access panel markers with screws on equipment access panels.

3.3 PIPING IDENTIFICATION

A. Install manufactured pipe markers indicating service on each piping system. Install with flow indication arrows showing direction of flow.
   1. Pipes with OD, Including Insulation, Less Than 6 Inches: Pretensioned pipe markers. Use size to ensure a tight fit.
   2. Pipes with OD, Including Insulation, Less Than 6 Inches: Self-adhesive pipe markers. Use color-coded, self-adhesive plastic tape, 1-1/2 inches wide, lapped at least 1-1/2 inches at both ends of pipe marker, and covering full circumference of pipe.

B. Locate pipe markers and color bands where piping is exposed in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior nonconcealed locations as follows:
   1. Near each valve and control device.
   2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
   3. Near penetrations through walls, floors, ceilings, and nonaccessible enclosures.
   4. At access doors, manholes, and similar access points that permit view of concealed piping.
   5. Near major equipment items and other points of origination and termination.
   6. Spaced at maximum intervals of 50 feet (15 m) along each run. Reduce intervals to 25 feet (7.6 m) in areas of congested piping and equipment.
   7. On piping above removable acoustical ceilings. Omit intermediately spaced markers.

3.4 VALVE-TAG INSTALLATION

A. Install tags on valves and control devices in piping systems, except check valves; valves within factory-fabricated equipment units; plumbing fixture supply stops; shutoff valves; faucets; convenience and lawn-watering hose connections; compressed air systems, all overhead reel systems, and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.

B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following:
   1. Valve-Tag Size and Shape:

   a. 2 inches square.
2. Valve-Tag Color:
   a. Black
3. Letter Color:
   a. White

3.5 ADJUSTING AND CLEANING

A. Relocate mechanical identification materials and devices that have become visually blocked by other work.

B. Clean faces of mechanical identification devices.

END OF SECTION

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SECTION 22 1116
DOMESTIC WATER PIPING

PART 1 GENERAL

1.1 GENERAL

A. All pipe, fittings, and pipe joining material used for potable water systems shall be lead free in accordance with state and federal regulations.

1.2 RELATED DOCUMENTS

A. Requirements of Section 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

1.3 SUMMARY

A. This Section specifies the water distribution piping system, including potable cold, hot, water piping, fittings, and specialties within the building.

B. Products installed but not furnished under this Section include water meters which will be provided by the Utility Company, to the site, ready for installation.

1.4 RELATED SECTIONS

The following Sections contain requirements that relate to this Section.

A. Refer to Civil specification for "Site Water Service Piping" for water service piping.

B. Section 31 - "Earthwork" for trenching and backfilling materials and methods for underground piping installations.

C. Section 07 -"Joint Sealers" for materials and methods for sealing pipe penetrations through basement walls and fire and smoke barriers.

D. Section 22 - "Gauges" for thermometers, flow meters, and pressure gauges.

E. Section 22 - "Mechanical Identification" for labeling and identification of piping system.

1.5 DEFINITIONS

A. **Water Distribution Piping:** A pipe within the building, or on the premises, which conveys water from the water service pipe, or meter, to the points of usage.

B. **Water Service Piping:** The pipe from the water main, or other source of potable water supply, to the water distributing system of the building served.

C. Pipe sizes used in this Specification are Nominal Pipe Size (NPS).

1.6 SUBMITTALS

A. Submit shop drawings, minimum of 1/4" scale, drawings shall be done in AutoCAD 2009 or later release. Shop drawings shall include pipe routing with elevations, dimensions, floor penetration locations. All systems shall be coordinated with structural, architectural and all other trades. Shop drawing includes piping for underground and above ground for all plumbing systems.

B. Product data, including operation and maintenance data, for each piping specialty and valve specified.

C. Welder's certificates certifying that welders comply with requirements specified in Quality Assurance below.

D. Certification of Compliance with ASME and UL fabrication requirements specified below.

E. Test reports specified in Part 3 of this specification.

1.7 QUALITY ASSURANCE

A. **Regulatory Requirements:** Comply with the provisions of the following:
   1. ASME B 31.9 "Building Services Piping" for, materials, products and installation. Safety valves and pressure vessels shall bear the appropriate ASME label.
   2. ASME "Boiler and Pressure Vessel Code," Section IX. "Welding and Brazing Qualification" for Qualifications for Welding Processes and Operators.
   3. New Orleans Sewage and Water Board Plumbing Code.

B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

C. Comply with NSF/ANSI Standard 61/372 requirements for potable domestic water piping and components.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store pipe and fittings in a manner to prevent sagging and bending and as per manufacturer.

B. Recommendation to be protected from direct sunlight.

1.9 SEQUENCING AND SCHEDULING

A. Coordinate the size and location of concrete equipment pads. Cast anchor bolt inserts into pad. Refer to Section 03 for concrete and formwork requirements.

B. Coordinate the installation of pipe sleeves for foundation wall penetrations.

1.10 EXTRA STOCK

A. Maintenance Stock: Furnish one valve key for each key operated hydrant, bibb, or faucet installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Domestic Water Piping:
      a. Charlotte Pipe
      b. Harvel
      c. Lewis Pipe Co.
      d. NIBCO
   2. Basket Strainers:
      a. Josam Mfg. Co.
      b. Metraflex Co.
      c. Mueller
      d. Spirax Sarco
      e. Smith (Jay R.) Mfg. Co.
   3. Balance Cocks:
      a. American Air Filter Co.
      b. Bell & Gossett ITT; Fluid Handling Div.
      c. Hammond Valve Corp.
      d. Milwaukee Valve Co., Inc.
      e. Spirax Sarco
      f. Taco, Inc.
   4. Bibbs and Faucets:
      a. Chicago Faucet Co.
      b. Hammond Valve Corp.
      c. Mansfield Plumbing Products
      d. Nibco Inc.
      e. Watts Regulator Co.
   5. Hydrants:
      a. Josam Mfg. Co.
      b. Jay R. Smith Mfg. Co.
      c. Wade/Tyler Pipe; Sub. of Tyler Corp.
      d. Watts Drainage Products
      e. Woodford Mfg. Co.
      f. Zurn Industries Inc., Hydromechanics Div.
   6. Backflow Preventers:
      a. Febco Sales, Inc.: Subs. of Charles M. Bailey Co., Inc.
      b. Hersey Products, Inc.
      c. Watts Regulator Co.
      d. Zum Industries, Inc.; Wilkins-Regulator Div.
      e. Vacuum Breakers
      f. Watts Regulator Co.
      g. Febco Sales, Inc.; Subs. of Charles M. Bailey Co., Inc.

h. Zurn Industries, Inc.; Willinr-Regulator Div.
7. Pressure Regulating Valves:
   a. Cash (A. W.) Valve Mfg. Corp.
   b. Cla-Val Co.
   c. Spence Engineering Co., Inc.
   d. Watts Regulator Co.
   e. Automatic Flow Control Valves
   f. Griswold Controls
8. Water Meters:
   a. Badger Meter, Inc.
   b. Hersey Products Inc.
   c. Neptune Water Meter Co.: Subs. Neptune Int'l.
   d. Rockwell Int'l. Municipal & Utility Div.
   e. Zurn Industries Inc.; Hays Fluid Controls Div.
9. Relief Valves:
   a. Cash (A. W.) Valve Mfg. Corp.
   b. Conbraco Industries, Inc.
   c. Watts Regulator Co.
   d. Zurn Industries, Inc.; Wilkins-Regulator Div.
10. Water Hammer Arresters:
   a. Amtrol, Inc.
   b. Josam Manufacturing Co.
   c. Jay R. Smith Mfg. Co.
   d. Wade/Tyler Pipe; Sub. of Tyler Corp.
   e. Watts Drainage Products
   f. Zurn Industries, Inc.; Hydromechanics Div.
   g. Sioux Chief Manufacturing Co., Inc.
   h. Precision Plumbing Products, Inc)
11. Dielectric Unions:
   a. Perfection Corp.
   b. Watts Regulator Co.
12. Y-Pattern Strainers:
   a. Armstrong Machine Works
   b. Hofhman Specialty ITT: Fluid Handling Div.
   c. Metraflex Co.
   d. Mueller
   e. Spirax Sarco
   f. Watts Regulator Co.
13. Press Fittings:
   a. ProPress by Ridgid/Viega

2.2 PIPE AND TUBE MATERIALS

A. General: Refer to Part 3, Article Applications, for identification of systems where the below materials are used.

B. Drawn tempered copper tubing: ASTM B88, Type L

C. Annealed tempered copper tubing: ASTM B88, Type K

D. Ductile iron pipe: ANSI A21.51 ductile iron pipe, with ANSI A21.4 cement mortar lining.

2.3 FITTINGS

A. Wrought-Copper Fittings: ANSI B16.22, streamlined pattern.

B. Ductile-iron Gasketed Fittings: AWWA C110, Schedule 150, with cement mortar lining and AWWA C111 rubber gaskets.

C. Press fittings: Copper press fittings shall conform to the material and sizing requirements of ASME B16.18 or B16.22. O-rings for the copper press fittings shall be EPDM.

D. Grooved Mechanical Couplings: Consist of non-galvanized ductile or malleable iron housing, a synthetic rubber gasket of a central cavity pressure-responsive design; with nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings. Nuts and bolts shall be stainless steel.

E. Cast-iron Threaded Flanges: ANSI B16.1, Class 125; raised ground face, bolt holes spot faced. Nuts and bolts shall be stainless steel.

F. Cast Bronze Flanges: ANSI B16.24, Class 150; raised ground face, bolt holes spot faced. Nuts and bolts shall be stainless steel.

2.4 UNIONS and CONNECTORS

A. Sweat type, wrought copper, ASTM B75, with dimensions conforming to ANSI B16.22 and sweep patterns for copper tubing.

B. Dielectric connections: Merit Brass Company or "V-line" (as manufactured by Lochinvar Company) dielectric couplings. Use couplings at junction of steel pipe and equipment with copper piping systems. Do not use steel or cast iron fittings in copper piping system. Brass fittings shall be used for dielectric locations. Dielectric flange kits at dissimilar metal flange connections.

C. Nipples: Unless otherwise noted, provide red-brass nipples to all pipe instruments including, but not limited to, instrument and temperature gauge thermo-wells, pressure gauges, etc. Nipples shall be designed and manufactured in accordance with Federal Specification WNN-351a, ASTM B687-88 and MS 51846.

D. Unions: ANSI B16.39, malleable iron, Class 150, hexagonal stock, with ball- and-socket joints, metal-to-metal bronze seating surfaces; female threaded ends. Threads shall conform to ANSI B1.20.1.

E. Flexible Connectors: Stainless steel bellows with woven flexible bronze wire reinforcing protective jacket; minimum 150 psig working pressure, maximum 250° F operating temperature. Connectors shall have flanged or threaded end

connections to match equipment connected; and shall be capable of 3/4 inch misalignment.

2.5 JOINING MATERIALS

A. Solder Filler Metals: ASTM B 32, 95-5 Tin-Antimony.
   1. J.W. Harris "Stay-safe 50" or equal 94.5% Tin - 0.5% Silver3% Antimony - 1.5% Zinc 0.5%Copper.

B. Brazing Filler Metals: AWS A5.8, BCup-4 6% silver for joints below ground.

C. Copper Pipe: 2 1/2 " and larger; (TIG) Gas Tungsten arc welding.

D. Gasket Material: Thickness, material, and type suitable for fluid to be handled, and design temperatures and pressures.

2.6 GENERAL DUTY VALVES

A. Valves (i.e., gate, globe, check, ball, and butterfly valves) are specified in Division 23 Section "Valves." Special duty valves are specified below by their generic name; refer to Part 3 Article "VALVE APPLICATION" for specific uses and applications for each valve specified. All domestic water valves shall be compliant with NSF/ANSI Standard 61.

2.7 SPECIAL DUTY VALVES (not used)

2.8 AUTOMATIC WATER FLOW CONTROL VALVES

A. General: Provide factory calibrated, direct acting, automatic pressure compensating type flow control valves. Each valve shall limit flow rates to within +5 accuracy, regardless of system pressure fluctuations.

B. Valve control mechanism shall consist of a tamperproof, stainless steel cartridge assembly with open chambers and unobstructed flow passages. Cartridge assembly shall include a self-cleaning, spring loaded moving cup guided at two separate points and shall utilize the full available differential pressure to actuate without hysterisis or binding.

C. Each valve shall be equipped with an upstream and downstream P/T fitting. Four differential pressure ranges shall be available with the minimum range requiring less than 2 psig.

D. Each valve to be provided with a metal tag, chain and stamped for system identification. Pressure taps and quick disconnect valves shall be provided with ferrous bodies.

E. All system flow control valves shall be of one manufacturer.

F. At the Contractor's option, flow control valves 1" and smaller with flow rates of 10 gpm and under, may be equipped with a combination upstream ball valve, Y-strainer with 20 mesh screen, an upstream P/T fitting, the flow control cartridge,

a downstream P/T fitting, and an outlet union. Valve shall be like Griswold Ultra Z.

G. Flow control valves shall be warranted by the manufacturer for five (5) years from the date of substantial completion.

2.9 THERMOSTATIC MIXING VALVE

A. Refer to drawing schedule.

2.10 PIPING SPECIALTIES

A. Water Hammer Arresters: Water hammer arresters shall be sized, tested and certified in accordance with PDI Standard WH-201, A.S.S.E.-1010 and A.N.S.I.-A112.26.1.

B. Spun closed, one-piece, seamless type 'L' copper tube and factory charged, with acetal piston, three EPDM O-rings, pressure-lubricated with Dow Coming III silicone compound, FDA approved. Unit shall be pressure rated for 250 psi, designed to keep waterline at 150 psi working pressure during pressure surges following quick valve closure. Working temperature from 33° F to 250° F

OR

C. Constructed of all stainless steel and with internal heavy duty balanced expansion bellows, pre-charged suitable for operation in temperature range of minus 100 to 300 degrees F and maximum 250 psig working pressure.

2.11 REACTION ANCHORS

A. Provide concrete thrust blocking or joint harness for all pressure piping in accordance with NFPA 24.

B. Thrust blocking: Sufficient mass of concrete, bearing on solid undisturbed earth, to resist hydraulic thrust at maximum pressure to which pipe will be subjected, 150 psi minimum.

C. Joint harness: Steel straps and rods across joints, securely anchored on pipe or other adequate anchorage to resist hydraulic thrust at maximum pressure to which pipe will be subjected, 150 psi minimum.
   1. Coal tar coating: Koppers Bitumastic type 50.
   2. Clamps, straps, and washers: steel, ASTM A506.
   3. Rods: Steel, ASTM A575
   4. Rod coupling: Malleable iron
   5. Bolts: Steel, ASTM A307
   6. Cast iron washers: Gray iron ASTM A126

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify all dimensions by field measurements. Verify that all water distribution piping may be installed in accordance with pertinent codes and regulations, the original design and the referenced standards.

B. Examine rough-in requirements for plumbing fixtures and other equipment having water connections to verify actual locations of piping connections prior to installation.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PIPE APPLICATIONS

A. Install Type L, drawn copper tubing with wrought copper fittings and solder joints for 4 inch and smaller above ground, within building.

B. At the contractor's option, install Type L, drawn copper tubing with wrought copper press fittings in accordance with the manufacturer's recommendations for 2 inch and smaller above ground within building.

C. At the contractor's option, install PEX tubing as allowed by the S&WB of New Orleans and in accordance with the manufacturer's recommendations for 1-1/2 inch and smaller above ground within building. PEX tubing shall comply with the ASTM E84 marking as well as the Warnock Hersey logo (certifying agency) signifying testing and compliance to the ASTM E84 Standard.

D. Install Type K, annealed temper copper tubing for 2 inch and smaller with no joints, below ground.

E. Install cement-lined ductile-iron pipe with rubber gasket joints below ground, inside and outside the building.

3.3 PIPING INSTALLATION

A. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of the piping systems. Location and arrangement of piping layout take into consideration pipe sizing and friction loss, expansion, pump sizing, and other design considerations. So far as practical, install piping as indicated.

B. Use fittings for all changes in direction and all branch connections.

C. Branch connections shall be made from the side or bottom of the main to facilitate drainage.

D. Install exposed piping, at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated.

E. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.

F. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.

G. Install piping tight to slabs, beams, joists, columns, walls, and other permanent elements of the building.

H. Provide space to permit insulation applications, with 1 inch clearance outside the insulation.

I. Allow sufficient space above removable ceiling panels to allow for panel removal.

J. Locate groups of pipes parallel to each other, spaced to permit applying full insulation and servicing of valves.

K. Install drains at low points in mains, risers, and branch lines consisting of a tee fitting, 3/4 inch ball valve, and short 3/4 inch threaded nipple and cap.

L. Exterior Wall Penetrations: Seal pipe penetrations through exterior walls using sleeves and mechanical sleeve seals. Pipe sleeves smaller than 6 inch shall be steel: pipe sleeves 6 inch and larger shall be sheet metal.

M. Fire Barrier Penetrations: Where pipes pass through time rated fire restive construction including fire rated walls, partitions, ceilings, and floors, maintain the fire rated integrity. Refer to Division-7 for special sealers and materials.

N. Install piping level with no pitch.

3.4 HANGERS AND SUPPORTS

A. Refer to Section 22 0529

3.5 PIPE AND TUBE JOINT CONSTRUCTION

A. Soldered Joints: Comply with the procedures contained in the AWS "Soldering Manual."
   1. CAUTION: Remove stems, seats, and packing of valves and accessible internal parts of piping specialties before soldering.
   2. Heat joints to proper and uniform temperature.

B. Threaded Joints: Conform to ANSI B1.20. 1, tapered pipe threads for field cut threads. Join pipe fittings and valves as follows:
   1. Note the internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
   2. Align threads at point of assembly.
   3. Apply appropriate tape or thread compound to the external pipe threads (except where dry seal threading is specified).
   4. Assemble joint wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.

C. Damaged Threads: Do not use pipe with threads which an corroded or damaged. If a weld opens during cutting or threading operations, that portion of pipe shall not be used.

D. Flanged Joints: Align flanged surfaces parallel. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible.
   1. Use suitable lubricants on bolt threads.
   2. Tighten bolts gradually and uniformly using torque wrench.

E. PVC Pipe fittings: No PVC pipe allowed.

3.6 SERVICE ENTRANCE

A. Extend water distribution piping to connect to water service piping of size and in location indicated for service entrance to building. Refer to Section 22 - Facility Water Distribution Piping for additional site construction requirements.

B. Install sleeve and mechanical sleeve seal at penetrations through foundation wall for watertight installation.

C. Install shutoff valve at service entrance inside building; complete with strainer, pressure gage, and test tee with valve.

D. Ductile-iron Pipe: Install in accordance with AWWA C-60.

E. Reaction anchors: Use concrete thrust blocking where solid undisturbed earth is available. Use joint harnesses in other places. If lack of undisturbed earth is the result of improper trench excavation, provide joint harness at no additional cost. Coat underground metal surfaces not encased in concrete with two coats of Koppers Bitumastic Type 50. Bitumastic shall be applied to clean dry surfaces only. Allow first coat to dry before applying second coat.

3.7 VALVE APPLICATIONS

A. General Duty Valve Applications: The Drawings indicate valve types to be used. Where specific valve types are not indicated the following requirements apply:
   1. Shut-off duty: Use gate, ball, and butterfly valves.
   2. Throttling duty: Use ball. and butterfly valves.

3.8 INSTALLATION OF VALVES

A. Sectional Valves: Install sectional valves on each branch and riser, close to main, where branch or riser serves 2 or more plumbing fixtures or equipment connections, and elsewhere as indicated. For sectional valves 2 inch and smaller, use gate or ball valves; for sectional valves 2-1/2 inch and larger, use gate or butterfly valves.

B. Shutoff Valves: Install shutoff valves on inlet of each plumbing equipment item, and on inlet of each plumbing fixture, and elsewhere as indicated. For shutoff

valves 2 inch and smaller, use gate or ball valves; for shutoff valves 2-1/2 inch and larger, use gate or butterfly valves.

C. Drain Valves: Install drain valves on each plumbing equipment item, located to completely drain equipment for service or repair. Install drain valves at the base of each riser, at low points of horizontal runs, and elsewhere as required to completely drain distribution piping system. For drain valves 2 inch and smaller, use gate or ball valves; for drain valves 2-1/2 inch and larger, use gate or butterfly valves.

D. Check Valves: Install swing check valves on discharge side of each pump, and elsewhere as indicated.

E. Balance Cocks: Install in each hot water recirculation loop, the discharge side of each pump, and elsewhere as indicated.

3.9 INSTALLATION OF PIPING SPECIALTIES

A. Install backflow preventers (RPZ) at make-up water connection to mechanical equipment and systems, and in compliance with the Louisiana State Plumbing Code (LSPC) and the Authority Having Jurisdiction (AHJ). Refer to contract drawings for general location of RPZ's. The AHJ shall approve the type of backflow prevention assembly or method required for containment based on the requirement of Table D104 and degree of hazard. If a cross-connection is not listed in Table D104, the Water Purveyor shall use Table B1 of the "Manual for the Selection, Installation, Maintenance, and Field Testing of Backflow Prevention Devices" (CAN/CSA Standard B64.10-1994) as a guide to determine the type of device to require. (This document is referred to in Table 606 of the LSPC, 2000 Edition.)

B. Install pressure regulating valves with inlet and outlet shutoff valves, and balance cock bypass. Install pressure gage on valve outlet.

C. Size and Locate Water Hammer Arresters in accordance with the following schedule, and located within an effective range of the quick-closing valve as per the requirements of Standard PDI-WH2O1 current edition, whether shown or not shown on the drawings.

WATER HAMMER ARRESTER SCHEDULE

MARK	I.P.S.	F.U. RATING	J.R. SMITH NO.	WADE NO.	ZURN NO.
'A'	1/2"	1-11	SC500	W-5	100
'B'	3/4"	12-32	SC750	W-10	200
'C'	1"	33-60	SC1000	W-20	300
'D'	1 ¼ "	61-113	SC1250	W-50	400
'E'	1 ½ "	114-154	SC1500	W-75	500
'F'	2"	155-330	SC2000	W-10	600

All water hammer arresters shall be P.D.I. certified.

3.10 EQUIPMENT CONNECTIONS

A. Supplies and Trim: All supplies, hardware, trim, traps, etc. to fixtures and equipment shall be chrome plated brass if exposed.

B. Piping Runouts to Fixtures: Provide hot and cold water piping runouts to fixtures of sizes indicated, but in no case smaller than required by Plumbing Code.

C. Mechanical Equipment Connections: Connect hot and cold water piping system to mechanical equipment as indicated. Provide shutoff valve and union for each connection. Provide drain valve on drain connection. For connections 2-1/2" and larger, use flanges instead of unions.

3.11 FIELD QUALITY CONTROL

A. Inspections: Inspect water distribution piping as follows:
   1. Do not enclose, cover, or put into operation water distribution piping system until it has been inspected and approved by the authority having jurisdiction and by the engineers.
   2. During the process of the installation, notify engineers and the plumbing official having jurisdiction, at least 24 hours prior to the time such inspection must be made.
   3. Perform tests specified below in the presence of the plumbing official.

B. Rough-in Inspection: Arrange for inspection of the piping system before being concealed or closed-in after system is roughed-in, and prior to setting fixtures.

C. Final Inspection: Arrange for a final inspection by the plumbing official to observe the tests specified below and to insure compliance with the requirements of the plumbing code.

D. Reinspections: Whenever the plumbing official finds that the piping system will not pass the test or inspection, make the required corrections and arrange for reinspection by the plumbing official.

E. Reports: Prepare inspection reports, signed by the plumbing official and submit a copy to the engineer.

F. Test water distribution piping as follows:
   1. Test for leaks and defects all new water distribution piping systems and parts of existing systems which have been altered, extended or repaired. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.
   2. Leave uncovered and unconcealed all new, altered, extended, or replaced water distribution piping until it has been tested and approved. Expose all such work for testing, that has been covered or concealed before it has been tested and approved.
   3. Cap and subject the piping system to a static water pressure of 50 psig above the operating pressure without exceeding the pressure rating of the piping system materials. Isolate the test source and allow to stand for a period of 4 hours. Leaks and loss in test pressure constitute defects which must be repaired.

4. Repair all leaks and defects using new materials and retest system or portion thereof until satisfactory results are obtained.
5. Prepare reports for all tests and required corrective action.

3.12 ADJUSTING AND CLEANING

A. Clean and Disinfect water distribution piping as follows:
   1. Purge all new water distribution piping systems and parts of existing systems, which have been altered, extended, or repaired prior to use.
   2. Hot water piping shall be sterilized with cold water, not heated.
   3. Use the purging and disinfecting procedure prescribed by the authority having jurisdiction, or in case a method is not prescribed by that authority, the procedure described in either AWWA C651, or AWWA D105 or as described below:
      a. Flush the piping system with clean, potable water until dirty water does not appear at the points of outlet.
      b. Fill the system or part thereof, with a water/chlorine solution containing at least 50 parts per million of chlorine. Isolate (valve off) the system, or part thereof, and allow to stand for 24 hours.
      c. Drain the system, or part thereof, of the previous solution, and refill with a water/chlorine solution containing at least 200 parts per million of chlorine and isolate and allow to stand for 3 hours.
      d. Following the allowed standing time, flush the system with clean potable water until chlorine does not remain in the water coming for the system.
      e. Submit water samples in sterile bottles to the authority having jurisdiction. Repeat the procedure if the biological examination made by the authority shows evidence of contamination.

B. Prepare reports for all purging and disinfecting activities.

C. The Contractor shall be solely responsible for the final delivery of the potable water system approved by the Louisiana State Department of Health & Hospitals.

3.13 COMMISSIONING

A. Fill the system.

B. Check compression tanks to determine that they are not air bound and that the system is completely full of water.

C. Before operating the system perform these steps:
   1. Open valves to full open position. Close drain, valves, hydrants, and sill cocks.
   2. Remove and clean strainers.
   3. Check pump for proper direction of rotation. Make any necessary corrections.
   4. Lubricate pump motors and bearings.

END OF SECTION

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SECTION 22 1413

DRAINAGE AND VENT SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Requirements of Section 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

1.2 RELATED SECTIONS

A. The following Sections contain requirements that relate to this Section.
   1. Section 02 for trenching and backfilling materials and methods for underground piping installations.
   2. Section 07 for materials and methods for sealing pipe penetrations through basement walls and fire and smoke barriers.
   3. Section 22 0553 for labeling and identification of piping system.

1.3 SUBMITTALS

A. Product data for the following products:
   1. Drainage piping specialties
   2. Drainage pipe and fittings
   3. Floor drains

B. Operation and Maintenance data for each piping specialty specified as required in Section 01.

C. Inspection reports specified in Part 3 of this Section.

D. Test reports specified in Part 3 of this Section.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with the provisions of the following:
   1. Louisiana State Plumbing Code and/or adopted Codes.
   2. Requirements of the Plumbing Official or the Authority Having Jurisdiction.
   3. Piping materials shall bear label, stamp, markings of specified manufacturer or testing agency.

1.5 SEQUENCING AND SCHEDULING

A. Coordinate the installation of drain flashing and roof penetrations.

B. Coordinate the installation of drains in poured-in-place concrete slabs, to include proper drain elevations, installation of flashing, and slope of slab to drains.

C. Coordinate with installation of sanitary sewer systems as necessary to interface building drains with drainage piping systems.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide drainage and vent systems components from one of the following:

1. Drainage Specialties including, but not limited to, backwater valves, expansion joints, and vandal-proof vent caps, etc.:
   a. Jay R. Smith Mfg. Co.
   b. Josam Mfg. Co.
   c. Wade/Tyler Pipe; Subs. of Tyler Corp.
   d. Watts Drainage Products
   e. Zurn Industries Inc.; Hydromechanics Div.

2. Floor drains:
   a. Jay R. Smith Co.
   b. Josam Mfg. Co.
   c. Wade/Tyler Pipe; Subs. of Tyler Corp.
   d. Watts Drainage Products
   e. Zurn Industries, Inc.

2.2 BELOW GROUND SANITARY AND VENT PIPE AND FITTINGS (INCLUDING GREASY WASTE)

A. Extra Heavy (XH) Hub and Spigot Cast Iron Soil Pipe and Fittings: Extra Heavy Cast Iron pipe and fittings shall be manufactured from gray cast iron with a tensile strength of not less than 21,000 psi. Compression gaskets shall be manufactured from an elastomer meeting the requirements of ASTM C 564. Pipe and fittings shall comply with ASTM A74. Compression gaskets shall comply with ASTM C 564. All pipe and fittings shall be made in the United States, and marked with the collective trademark of the Cast Iron Soil Pipe Institute, and listed by NSF® International. All pipe and fittings shall be of the same manufacturer. Provide products by Charlotte Pipe and Foundry Co. or prior approved equivalent.

2.3 ABOVE GROUND SANITARY AND VENT PIPING AND FITTINGS

A. Hubless Cast-Iron Soil Pipe: All waste lines and fittings shall conform to the requirements of CISPI Standard 301, ASTM C-564 or ASTM A-74. All pipe and fittings shall be made in the United States, and marked with the collective trademark of the Cast Iron Soil Pipe Institute, and listed by NSF® International. All pipe and fittings shall be of the same manufacturer. Provide products by Charlotte Pipe and Foundry Co. or prior approved equivalent.

1. Joints for hubless pipe and fittings shall conform to the manufacturer's installation instructions and local codes requirements. Hubless couplings shall conform to CISPI 310 or ASTM C1277, C564 or ASTM G1540 for super duty couplings.

B. PVC pipe shall not be used.

2.4 DRAINAGE PIPING SPECIALTIES

A. Cleanout Plugs: Cast-bronze or brass, threads complying with ANSI B2.1, countersunk head.

B. Flashing Flanges: Cast-iron watertight stack or wall sleeve with membrane flashing ring. Provide underdeck clamp and sleeve length as required.

C. Cleanouts:
1. Floor Cleanouts: Cast-iron body and frames or combination cast-iron/ABS body and frame; brass cleanout plug; nickel-bronze adjustable round top. Manufacturer's standard cast unit of pattern indicated as follows:
   a. Pattern: Exposed flush type, standard non-slip scoriated finish; Jay R. Smith 4023. Nickel Bronze Round top.
   b. Pattern: In carpeted areas, Polished Bronze flush type, standard non-slip scoriated finish, stainless steel carpet marker; Jay R. Smith 4023Y.
   c. Pattern: In tile, Nickel Bronze, flush type, standard non-slip scoriated finish: Jay R. Smith 4143, round top.
   d. Pattern: In terrazzo, Nickel Bronze, flush type, standard non-slip scoriated finish: Jay R. Smith 4183, round top.
2. Wall Cleanouts: Duco cast iron caulk ferrule with cast bronze taper threaded plug nickel bronze frame and polished bronze secured cover flush with wall like Jay R. Smith model 4435.

D. Floor drains:
1. General: Provide floor drains of size as indicated on drawings; and type, including features, as specified in Drawing P100 schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine rough-in requirements for plumbing fixtures and other equipment having drain connections to verify actual locations of piping connections prior to installation.

B. Examine walls, floors, roof, and plumbing chases for suitable conditions where piping and specialties are to be installed.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General Locations and Arrangements: Drawings (plans, schematics, and diagrams) indicate the general location and arrangement of the piping systems. Location and arrangement of piping layout take into account many design considerations. So far as practical, install piping as indicated.

B. Use fittings for all changes in direction and all branch connections.

C. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated.

D. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications.

E. Conceal all pipe installations in walls, pipe chases, utility spaces, above ceilings, below grade or floors, unless indicated to be exposed to view.

F. Install piping tight to slabs, beams, joists, columns, walls, and other permanent elements of the building. Allow sufficient space above removable ceiling panels to allow for panel removal.

G. Exterior Wall Penetrations: Seal pipe penetrations through exterior walls using sleeves and mechanical sleeve seals. Pipe sleeves smaller than 6 inch shall be steel; pipe sleeves 6 inch and larger shall be sheet metal.

H. Fire Barrier Penetrations: Where pipes pass through fire rated walls, partitions, ceilings, and floors, maintain the fire rated integrity. Refer to Section 07 for special sealers and materials. All piping penetrations through fire rated walls shall be cast iron.

I. Make changes in direction for drainage and vent piping using appropriate 45 degree wyes, half-wyes, or long sweep quarter, sixth, eighth, or sixteenth bends. Sanitary tees or short quarter bends may be used on vertical stacks of drainage lines where the change in direction of flow is from horizontal to vertical, except use long-turn tees where two fixtures are installed back to back and have a common drain. Straight tees, elbows, and crosses may be used on vent lines. No change in direction of flow greater than 90 degrees shall be made. Where different sizes of drainage pipes and fittings are connected, use proper size, standard increasers and reducers. Reduction of the size of drainage piping in the direction of flow is prohibited.

3.3 HANGERS AND SUPPORTS (ABOVE GROUND and BELOW GROUND)

A. General: Hanger, supports, and anchors devices are specified in Section 22 0529 - Pipe Hangers. Conform to the following requirements for maximum spacing of supports.
   1. Install the following pipe attachments:
      a. Adjustable steel clevis hangers for individual horizontal runs less than 20 feet in length.
   2. Install hangers at the intervals required by local Plumbing Code.

3. For below ground, pipe shall be installed with stainless steel hangers and rods at 4'-0' foot spacing with a hanger at every joint. Pipe supports shall meet the requirements of the local Plumbing Code.

3.4 INSTALLATION OF PIPING SPECIALTIES

A. For interior installation, provide cleanout cover flush to floor centered over backwater valve cover and of adequate size to remove valve cover for service.
   1. Above Ground Cleanouts: Install in above ground piping and building drain piping as indicated, and:
      a. As required by plumbing code;
      b. At each change in direction of piping greater than 45 degrees;
      c. At minimum intervals of 50 ft. for piping 4" and smaller and 75 ft. for larger piping;
      d. At base of each vertical soil or waste stack.

   2. Cleanouts Covers: Install floor and wall cleanout covers for concealed piping, types as indicated.

B. Flashing Flanges: Install flashing flange and clamping device with each stack and cleanout passing through waterproof membranes.

3.5 INSTALLATION OF FLOOR DRAINS

A. General: Install floor drains in accordance with manufacturer's written instructions and in locations indicated.

B. Coordinate flashing work with work of waterproofing and adjoining substrate work.

C. Install floor drains at low points of surface areas to be drained, or as indicated. Set tops of drains flush with finished floor.

D. Install drain flashing collar or flange so that no leakage occurs between drain and adjoining flooring.

E. Maintain integrity of waterproof membranes, where penetrated.

F. Position drains so that they are accessible and easy to maintain.

G. Waterproof each floor drain above ground by providing a 16-inch x 16-inch flashing constructed in place using 40 mil chlorinated polyethylene sheets (Chloraloy 240). Install using manufacturers recommended procedure and in accordance with the Plumbing Code. Installation of flashing shall be coordinated with the floor construction.

3.6 CONNECTIONS

A. Piping Runouts to Fixtures: Provide drainage and vent piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated; but in no case smaller than required by the plumbing code.

B. Locate piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.

3.7 FIELD QUALITY CONTROL

A. Inspections:
   1. Do not enclose, cover, or put into operation drainage and vent piping system until it has been inspected and approved by the authority having jurisdiction and the engineer.
   2. During the progress of the installation, notify the plumbing official having jurisdiction and the engineer at least 24 hours prior to the time such inspection must be made. Perform tests specified below in the presence of the plumbing official.
      a. Rough-in Inspection: Arrange for inspection of the piping system before concealed or closed-in after system is roughed-in, and prior to setting fixtures.
      b. Final Inspection: Arrange for a final inspection by the plumbing official to observe the tests specified below and to insure compliance with the requirements of the plumbing code.
   3. Re-inspections: Whenever the piping system fails to pass the test or inspection, make the required corrections, and arrange for re-inspection by the plumbing official.
   4. Reports: Prepare inspection reports, signed by the plumbing official.

B. Piping System Test drainage and vent system as follows:
   1. Test for leaks and defects all new drainage and vent piping systems and parts of existing systems, which have been altered, extended or repaired. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.
   2. Leave uncovered and unconcealed all new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose all such work for testing that has been covered or concealed before it has been tested and approved.
   3. Rough Plumbing Test Procedure: Except for outside leaders and perforated or open jointed drain tile, test the piping of plumbing drainage and venting systems upon completion of the rough piping installation. Tightly close all openings in the piping system, and fill with water to the point of overflow, but not less than 10 feet head of water. Water level shall not drop during the period from 15 minutes before the inspection starts, through completion of the inspection. Inspect all joints for leaks.
   4. Finished Plumbing Test Procedure: After the plumbing fixtures have been set and their traps filled with water, their connections shall be tested and proved gas and water-tight. Plug the stack openings on the roof and building drain where it leaves the building, and introduce air into the system equal to a pressure of 1" water column. Use a "U" tube or manometer inserted in the

trap of a water closet to measure this pressure. Air pressure shall remain constant without the introduction of additional air throughout the period of inspection. Inspect all plumbing fixture connections for gas and water leaks.

5. Repair all leaks and defects using new materials and retest system or portion thereof until satisfactory results are obtained.
6. Prepare reports for all tests and required corrective action.

3.8 ADJUSTING AND CLEANING

A. Clean interior of piping system. Remove dirt and debris as work progresses.

B. Clean drain strainers, domes, and traps. Remove dirt and debris.

3.9 PROTECTION

A. Protect drains during remainder of construction period, to avoid clogging with dirt and debris, and to prevent damage from traffic and construction work.

B. Place plugs in ends of uncompleted piping at end of day or whenever work stops.

C. Exposed ABS or PVC Piping: Protect plumbing vents exposed to sunlight with 2 coats of a water-based latex paint.

END OF SECTION

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SECTION 22 4000
PLUMBING FIXTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Requirements of Section 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

B. The requirements of the following Sections apply to this Section:
1. Section 23 0500 - Common Work for HVAC, Plumbing, and Fire Protection
2. Section 23 0516 - Piping and Fittings
3. Section 22 0529 - Pipe Hangers

C. Separate grab bar and toilet accessories are not an integral part of the plumbing fixtures and are specified under Section 10.

1.2 DESCRIPTION OF WORK

A. Extent of plumbing fixtures work required by this Section is indicated on drawings and schedules, and by requirements of this Section.

B. Types of plumbing fixtures specified in this Section include the following:
1. Water closets
2. Urinals
3. Lavatories
4. Stainless Steel Fixtures
5. Mob Basin
6. Tub and Showers

C. Refer to Section 26 for field installed electrical wiring required for plumbing fixtures.

1.3 QUALITY ASSURANCE

A. Plumbing Fixture Standards: Comply with applicable portions of the local and State Plumbing Code herein referred to as the Plumbing Code.

B. ANSI Standards: Comply with applicable ANSI standards pertaining to plumbing fixtures and systems, and bath tub units including the following:
1. ANSI A112.6.1 - Supports for Off-the-Floor Plumbing Fixtures for Public Use.
2. ANSI A112.18.1 - Plumbing Fixture Fittings.
3. ANSI A112.19.2 - Vitreous China Plumbing Fixtures.
4. ANSI A112.19.3 - Stainless Steel Plumbing Fixtures

C. PDI Compliance: Comply with standards established by PDI pertaining to plumbing fixture supports.

D. NAHB Label: Provide fiberglass bath tub units and shower stalls which have been tested and labeled by NAHB Research Foundation, Inc.

E. UL Compliance: Construct water coolers in accordance with UL Standard 399 "Drinking-Water Coolers," and provide UL-listing and label.

F. ASHRAE Compliance: Test and rate water coolers in accordance with ASHRAE Standard 18 "Method of Testing for Rating Drinking Water Coolers with Self-Contained Mechanical Refrigeration Systems."

G. ARI Compliance: Construct and install water coolers in accordance with ARI Standard 1010 "Drinking-Fountains and Self-Contained Mechanically- Refrigerated Drinking-Water Coolers," and provide Certification Symbol.

H. ANSI Compliance: Construct and install barrier-free plumbing fixtures in accordance with ANSI Standard A117.1 "Specifications for making buildings and facilities accessible to and usable by physically handicapped people."

I. ASSE Compliance: ASSE 1037 - (Pressurized Flushing Devices)

J. ADA Compliance: Construct and install barrier-free plumbing fixtures in accordance with Title III of the ADA of 1990 accessibility guidelines for buildings and facilities.

1.4 SUBMITTALS

A. Product Data: Submit Manufacturer's Technical Product Data and installation instructions for each fixture, faucet, specialty, accessory, and trim specified; clearly indicate rated capacities of selected models of water coolers.

B. Shop Drawings: Submit rough-in drawings. Detail dimensions, rough-in requirements, required clearances, and methods of assembly of components and anchorages.

C. Shop drawings shall be made in Autocad version 14 or higher and at a minimum scale of ¼" per foot.

D. Maintenance Data: Submit maintenance data and parts lists for each type of plumbing fixture and accessory; including "trouble-shooting" maintenance guide. Include this data and produce data in maintenance manual; in accordance with requirements of Section 01.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver plumbing fixtures, specialties, accessories, and trim individually wrapped in factory-fabricated containers.

B. Handle plumbing fixtures specialties, accessories, and trim carefully to prevent breakage, chipping and scoring fixture finish. Do not install damaged plumbing fixtures specialties, accessories, or trim; replace and return damaged units to equipment manufacturer.

PART 2 - PRODUCTS

2.1 GENERAL

A. General: Provide factory-fabricated fixtures of type, style and material indicated. For each type fixture, provide trim and fittings including faucets, supplies, stops, traps, tailpieces, waste nipples, hangers, plates, brackets, anchors, supports, hardware, and fastening devices required for a complete installation.

B. All vitreous china plumbing fixtures shall be furnished by the same manufacturer for each product specified throughout.

C. All fixture trim shall be by same manufacturer for each product specified throughout.

2.2 MATERIALS

A. Provide materials which have been selected for their surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, foundry sand holes, stains, discoloration, or other surface imperfections on finished units are not acceptable.

B. Where fixture trim and accessories are exposed or semi-exposed, provide bright chrome-plated or polished stainless steel units. Provide copper or brass where not exposed.

C. Stainless Steel: ASTM A 167, Type 302/304, hardest workable temper, with No. 4 finish having, bright, directional polish on exposed surfaces.

D. Vitreous China: High Quality, free from fire cracks, spots, blisters, pinholes and specks; glaze exposed surfaces, and test for crazing resistance in accordance with ASTM C 554.

E. Fiberglass: ANS1 Z124, smooth surfaced, with color selected by Architect/Engineer.

F. Synthetic Stone: High quality, free from defects, glaze on exposed surfaces, stain resistant.

2.3 PLUMBING FIXTURES

A. Refer to plumbing drawing schedules.

2.4 SHOCK ABSORBERS

A. Equivalent to Precision Plumbing Products as recommended by manufacturer.

2.5 TRAP PRIMER

A. Equivalent to Precision Plumbing Products as recommended by manufacturer.

2.6 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with requirements, provide plumbing fixtures of one of the following:

2.7 WATER CLOSETS, URINALS, AND LAVATORIES

A. Kohler Co.

B. American Standard

C. Crane Co.

D. Toto

E. Zurn Industries, Inc.

2.8 STAINLESS STEEL SINKS

A. Kohler

B. Elkay Mfg. Co.

C. Just Mfg. Co.

2.9 STOPS AND SUPPLY TUBING

A. Brass Craft

B. Chicago Faucet Co.

C. Kohler Co.

D. McGuire

E. T and S Brass and Bronze Works. Inc.

F. Zurn

2.10 LAVATORY/SINK FAUCETS AND TRIM

A. Chicago Faucet Co.

B. Delta Faucet Co; Div. of Masco Corp.

C. American Standard

D. Kohler Co.

E. Symmons

F. Zurn Aqua-Spec

2.11 LAVATORY/SINK P-TRAPS AND TAILPIECES

A. Crane

B. Eljer

C. Kohler Co.

D. McGuire

E. Zurn Aqua-Spec

F. ADA INSULATION KITS

G. True Bro

H. SKAL - GARD

I. Plumberex

2.12 FIXTURE CARRIERS

A. Josam Mg. Co.

B. J.R.Smith Mfg. Co.

C. Wade Div.

D. Zurn Industries, Inc.

2.13 FIXTURE SEATS

A. Bemis Mfg. Co.

B. Beneke Corp.

C. Church Products, Forbes-Wright Industries. Inc.

D. Olsonite Corp.

E. Zurn Industries, Inc.

PART 3 - EXECUTION

3.1 INSPECTION

A. Installer of rough-in work of potable water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping, and other unsatisfactory conditions for installation of plumbing fixtures. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 INSTALLATION OF PLUMBING FIXTURES

A. General: Install plumbing fixtures of types indicated where shown and at indicated heights: in accordance with fixture manufacturer's written instructions, rough-in drawings, and with recognized industry practices. Ensure that plumbing fixtures comply with requirements and serve intended purposes. Comply with applicable requirements of The Americans with Disabilities Act of 1990 (including all applicable amendments), ANSI A117.1 and the 2000 Louisiana State Plumbing Code pertaining to installation of plumbing fixtures.

B. Fasten plumbing fixtures securely to indicated supports or building structure; and ensure that fixtures are level and plumb. Secure plumbing supplies behind or within wall construction so as to be rigid, and not subject to pull or push movement.

C. Protect installed fixtures from damage during remainder of construction period.

D. Caulk around all wall or floor mounted fixtures using nonporous-bond silicone rubber mold/mildew resistant acid type sealant depositing a uniform continuous ribbon without gaps or air pockets, and with complete "wetting" of joint bond surfaces equally on opposite sides. Fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal and vertical surface, fill joints to form a slight cove, so that joint will not trap moisture and dirt.

E. Flush Controls designated as "barrier free" which are hand operated or automatic shall comply with The Americans with Disabilities Act of 1990, Article 4.16.5 and 4.27.4. Controls for flush valves shall be mounted on the wide side of toilet areas no more than 44 inches above the floor to centerline of trip lever/push button for use by adults, and no more than 32" above the floor to centerline of trip lever/push-button for use by children in elementary schools.

F. Do not allow use of fixtures for temporary facilities unless expressly approved in writing by the Owner.

3.3 MOUNTING HEIGHTS SCHEDULE

FIXTURE	MOUNTING HEIGHT
Water Closet	15" floor to seat
Wheelchair Water Closet	17" floor to seat
Standard Urinals	24" floor to rim
Barrier free Urinals	17" floor to rim
Lavatory or Sink	31" floor to rim
Barrier free Lavatories	29" Min. Knee Clearance

3.4 FIELD QUALITY CONTROL

A. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to

demonstrate compliance: otherwise, remove and replace with new units and proceed with retesting.

B. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect/Engineer. Remove cracked or dented units and replace with new units.

3.5 ADJUSTING AND CLEANING

A. Clean plumbing fixtures, trim and strainers of dirt and debris upon completion of installation.

B. Adjust water pressure at drinking fountains, faucets, shower valves, and flush valves to provide proper flow stream and specified gpm.

C. Adjust or replace washers to prevent leaks at faucets and stops.

END OF SECTION

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DIVISION 23

HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

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SECTION 23 0500
COMMON WORK FOR HVAC, PLUMBING, AND FIRE PROTECTION

PART 1 GENERAL

1.1 PROVISIONS

A. Requirements of Section 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

B. Contents of this section shall be considered part of Section 21, Section 22, and Section 23.

1.2 DESCRIPTION

A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, permits, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.

B. The Work described in this section of the specifications includes, but is not limited to, the following:
   1. Installation of VRV air conditioning system, controls and devices required by drawings and specifications and required for a fully functional system.
   2. Installation of refrigerant and condensate piping, fittings, accessories and insulation.
   3. Bracing and anchoring equipment and piping systems.
   4. Testing and balancing of mechanical systems and correction of deficiencies.
   5. Preparation and submittal of maintenance manuals, shop drawings, product data, and samples.
   6. Maintaining a record set of bond paper prints and marking them to indicate locations of concealed items, and deviations made to suit existing job-site conditions.
   7. Production of mechanical as-built (record) drawings.

1.3 RELATED WORK

A. The following items of related work are specified and included in other sections of these specifications:
   1. Section 21 - Fire Suppression
   2. Section 22 - Plumbing
   3. Section 23 - Mechanical
   4. Section 26 - Electrical

1.4 JOB CONDITIONS

A. Submittal of bid implies bidder has read applicable paragraphs of the specifications and will be bound by their conditions.

B. Contractor Qualifications: Experience installing commercial cooling and heating systems, plumbing and piping systems similar to those described in these specifications.

C. Contractor must be licensed and hold a current contracting license.

D. Contractor must be able to bond work for performance of work being bid as stated in the Advertisement for Bids.

1.5 INTENT

A. The contract documents (drawings, plans and specifications) describe the mechanical work of this project. Any item mentioned in one part shall be as binding as though mentioned in both.

B. The contract documents form a guide for a complete and operable mechanical installation. Where an item is reasonably necessary but not specifically mentioned, such as duct hangers or transitions, piping offsets, drains, etc., for a complete system, provide same.

C. Mechanical layouts indicated on drawings are diagrammatical only. Exact locations of ducts, pipes, and equipment shall be governed by the drawings of related trades.

1.6 DEVIATIONS

A. No deviations from specifications and drawings shall be made without full knowledge and written consent of the Designer.

B. During progress of work, existing conditions which dictate a modification of any particular requirement shall be promptly reported for a decision or instructions from the Designer.

1.7 QUALITY ASSURANCE

A. Comply with applicable local, state and federal codes.

B. Comply with applicable requirements of recognized industry associations which promulgate standards for the various trades.

C. Employ only qualified journeymen for this work. Employ competent, qualified mechanics to supervise the work.

1.8 CODES AND STANDARDS

A. Perform work in accordance with codes and standards listed below, and such standards that may be specified in other sections. When these specifications are

more stringent, they take precedence. In case of conflict, obtain a decision from the Designer.

1. NFPA: National Fire Protection Association
2. 2012 International Mechanical Code
3. 2012 International Building Code
4. 2012 International Fuel Gas Code
5. Louisiana State Plumbing Code, 2013 Edition.
6. ANSI Handicapped Code-A117.1.
7. ANSI: American National Standards Institute.
8. ARI: American Refrigeration Institute.
9. ASHRAE: American Society of Heating Refrigeration and Air Conditioning.
10. ASME: American Society for Mechanical Engineers.
11. ASTM: American Society for Testing and Materials.
12. MSS: Manufacturer's Standardization Society of the Valve and Fitting Industry
13. NEMA: National Electrical Manufacturers' Association
14. FPA: National Fire Protection Association.
15. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association
16. UL: Underwriters' Laboratories, Inc
17. CISPI: Cast Iron Soil Pipe Institute
18. Fire Marshal of the State of Louisiana
19. Louisiana State Department of Health Services and Environmental Quality
20. American Water Works Association (AWWA)

1.9 COORDINATION

A. Carefully examine specifications and drawings to be thoroughly familiar with items which require plumbing or HVAC connections and coordination.

B. Coordinate with other building trades to leave proper chases and openings. Place outlets, anchors, sleeves, and supports prior to pouring concrete or installation of masonry work.

1.10 SUBMITTALS

A. Submit items to the Designer. Submittals are only required for specific items of equipment or material listed in individual sections of these specifications and for equipment and devices scheduled on drawings.

B. For specified manufacturers and model number equipment and devices, substitutions will be allowed by prior approval in accordance with Article 3.3 of the Instructions to Bidders.

C. Shop Drawings: Submit seven sepia copies of shop drawings, including:
   1. Automatic temperature control system.
   2. Concrete pads and foundations including anchor bolt and sleeve locations.
   3. All new air handling units, hydronic heaters, fans and constant volume boxes.
   4. All new chilled water, hot water and condensate drain piping with valves, fittings, radiant heat panel and accessories.
   5. Brochures: Submit seven copies of manufacturer's brochures including:

a. Complete descriptions
b. Illustrations
c. Specifications data of materials, and operating rates, etc
d. Where items other than those proposed for use are illustrated and/or described on the same brochure pages, clearly indicate the items proposed for use
e. Samples: Generally, samples will not be required, but if there is doubt on the part of the Designer as to unit prepared for use, he may call for a sample. In that case, pay for packaging and transportation both ways. Item will remain the property of the submitter and may, if approved, be incorporated in the work.

1.11 OPERATING AND MAINTENANCE MANUALS

A. Three sets of the following data are required:
   1. Operating and maintenance instructions
   2. Spare parts lists
   3. Copies of approved submittal data
   4. Equipment warranties
   5. Air balance report
   6. Arrange each set of data in an orderly way, and bind each set in a separate three-ring, hard cover binder in accordance with Section 01 requirements.
   7. As soon as data begins to accumulate, prepare one of the sets and deliver it to the Designer. Continuously update that set as additional data is obtained.
   8. At completion of work, deliver two complete sets (in addition to set in A.3 above) to Designer.

1.12 DELIVERY AND STORAGE

A. Insofar as possible, deliver items in manufacturer's original unopened packaging. Where that is not practical, cover items with protective materials to keep them from being damaged. Use care in loading, transport, unloading, and storage to keep items from being damaged.

B. Store items in a clean, dry place, and protect from damage.

1.13 GUARANTEE

A. Guarantee all material, equipment, and workmanship for all sections under Sections 21, 22 and 23 in writing to be free from defects of material and workmanship for one year from date of final acceptance by the Designer or substantial completion. Replace without charge any material or equipment proving defective during this period. The guarantee shall include performance of the equipment under all conditions of load, installing any additional items of control and/or protective devices as required and the replacing of any refrigerant lost.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Within the Contract Documents relating to mechanical work, manufacturers' names, catalog numbers, and other proprietary references to materials and equipment are made. Such references are made to establish the standards of quality and type required, and not to limit competition. Most known or acceptable manufacturers of competitive products are listed in applicable sections as "approved equals". Reasonable requests for substitution or additions to "approved equals" will be considered, but the Designer will be the sole judge of acceptability of items proposed as substitutes.

B. Materials and equipment used in carrying out these specifications shall bear UL or other recognized testing laboratory label when such labels are available.

2.2 BASIC MATERIALS/METHOD

A. Access doors, panels and frames: Style and type as required for material in which installed.
   1. Size: 16" x 16" minimum, as indicated, or as required to allow inspection, service and removal of items served.
   2. Fourteen gauge minimum sheet metal for doors, 16 gauge frames of cadmium-plated or galvanized construction. Doors shall have expanded plaster rings where located in plaster walls or flanged finish where located in drywall or block construction.
   3. Panels shall have spring hinges with screwdriver locks in non-public areas. Key lock, keyed alike, for panels in public areas.
   4. Prime painted or rust inhibitive paint finish.
   5. UL labeled when in fire-rated construction, one and one half (1-1/2) hour rating.
   6. Provide in walls, floors, and ceilings to permit access to all equipment and piping requiring service or adjustment. Examples of such equipment needing access are dampers, mechanical system valves, and equipment needing periodic or replacement maintenance.
   7. Furnish and locate access panels under this Section. Coordinate with other trades who are responsible for building system in which panels are to be installed.
   8. Manufacturers shall be Inland-Milcor, Bilco, Miami Carey, or approved equal. Use panels equal to Milcor Style M for masonry and drywall construction and equal to Milcor Style K for plastered masonry walls and ceilings. Stainless steel panels shall be used in ceramic tile or glazed structural tile.

PART 3 EXECUTION

3.1 LOCATIONS

A. Mechanical layouts indicated on drawings are diagrammatical. Exact locations of ducts, pipes, and equipment may vary because of conflicts with work of other trades. Work out conflicts where relocations will not affect operation or appearance of systems.

B. Locate equipment requiring periodic servicing so that it is readily accessible. Do not back up service sides to walls, nor place it too close to other equipment to make service impractical.

3.2 CUTTING AND PATCHING

A. Repair or replace routine damage caused by cutting in performance of contract.

B. Correct damage caused due to installation of mechanical work.

C. Perform repairs with materials which match existing and install in accordance with the appropriate section of these specifications.

3.3 CONNECTION TO EQUIPMENT

A. Connect or install equipment shown on mechanical drawings that requires plumbing and/or mechanical hookups.

B. Rough-in piping and connect equipment.

C. Provide piping, shutoff valves, and unions required for a complete and operable installation.

3.4 SERVICE OF SYSTEMS

A. If equipment is placed in service prior to acceptance of the project by Owner, operate equipment strictly in accordance with manufacturer's instructions.
   1. Employ competent, qualified personnel in operation of the equipment.
   2. Provide for proper operation and cleanliness.
   3. Open up equipment for inspection as directed by the Designer.

B. Lubricate equipment and perform such other maintenance as required to place it in like-new operating condition.

3.5 ACCEPTANCE OF SYSTEMS

A. Complete the following before requesting a final inspection:
   1. Work required under this division of specifications except as permitted. Special attention shall be paid to completion of work required under Section 23 0630 - Cleaning Mechanical Systems.
   2. System balancing. Provide for "Substantial Completion" inspection.
   3. Control system checkout.
   4. Furnish required operating instructions, wiring diagrams, and electronic "project record document" control diagrams in accordance with Section 01 and provide one copy of each in the equipment rooms as specified elsewhere.
   5. Designer will accept job on basis of tests and inspections. A representative of firm that performed test and balance work is to be in attendance to assist; and furnish necessary mechanics to operate system, make any necessary adjustments, and assist with final inspection.

3.6 TRAINING

A. At a time agreed between the Owner and Contractor, provide training of the Owner's HVAC system operating personnel. This training shall be for a minimum 4 hour training sessions excluding travel time. The training shall be by a factory authorized and trained agent of the controls manufacturer. The training shall include, as a minimum, start-up, normal operation, set point adjusting, start-up after a power failure, and troubleshooting. Contractor shall provide establishment of Owner/Manufacturer interface for future system operation and maintenance support.

END OF SECTION

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SECTION 23 0516
PIPING & FITTINGS

PART 1 - GENERAL

1.1 PROVISIONS

A. Requirements of Division 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Architect for consideration in accordance with Division 01. Those judged to be equal to that specified, will receive written approval.

1.2 DESCRIPTION

A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.

B. The work described in this section of the specifications includes but is not limited to the following:
   1. Provide and install piping of every kind for mechanical systems with all necessary hangers, fittings, and hardware as necessary for fully functional piping systems.

C. All piping nipples for chilled water heating hot water, condenser water system shall be red brass only. No exceptions.

1.3 RELATED WORK

A. The following items of related work are specified and included in other sections of these specifications:
   1. Section 23 05 00: Common Work For HVAC, Plumbing, and Fire Protection.
   2. Section 23 05 19: Meters and Gauges for HVAC Piping.
   3. Section 23 05 93: HVAC Testing, Adjusting and Balancing Requirements.
   4. Section 23 05 23: Valves.
   5. Section 22 05 29: Pipe Hangers.
   6. Section 23 06 30: Cleaning HVAC Systems.
   7. Section 23 07 00: Pipe Insulation.
   8. Section 23 32 00: Sheet Metal Accessories.

1.4 SUBMITTALS

A. Submit seven copies of all piping and fittings for review by the Architect.

PART 2 - PRODUCTS

2.1 STEEL PIPE

A. Manufacturers for Steel Pipe and Fittings: Bethlehem, Le Barge Pipe Bending & Coiling, Ohio Pipe, Grinnell, U.S. Steel, Tube Turn, Victaulic, Fee & Mason, Gustin-Bacon, Allied, Daniel, Ladish, Naylor, Anvil, Cajon, or prior approved equal.

B. Chilled Water Supply and Return, Condenser Water Supply and Return, Make-up Water.
   1. 2-1/2" through 10": Carbon steel pipe, ASTM A53 or A106, Grade B, Type S seamless or Type E electric resistance welded, Schedule 40. Mechanical grooved type pipes and fittings may be used as a substitute pipe joint method at Contractors option. Grooved type joints and fittings shall only be permitted where the joints are located to be readily accessible or provided with service access, and where a leak or seepage will not cause damage or loss.

2.2 STEEL PIPE FITTINGS

A. Flanges, Fittings, Unions and Similar Items: Commercially available products marked in accordance with MSS-SP-25 marking on small size of odd shaped products may be omitted provided they are listed in the sequence so allowed by MSS-SP-25, but such products shall bear the manufacturer's name and trademark. Provide weld neck flanges for all flanged valve connections. Slip-on flanges are not acceptable unless otherwise noted.

B. Fittings 2-1/2" through 10": Steel butt weld fittings, ANSI B16.9, ASTM A234, Grade WPB, long turn ells. Weld-o-lets and thread-o-lets permitted if branch is at least 2 pipe sizes smaller than main, fittings at least wall thickness to match pipe.

C. Fittings 2" and smaller: Malleable iron threaded fittings, ANSI B16.3. Fittings shall be 125 lb. minimum for pressures less than 75 PSI and 300 lb. for pressures above 75 PSI. Steam condensate shall be 300 lb. for all pressures.

D. Flanges: Carbon steel, ANSI B16.5 weld neck. Class 300 flanges required for steam service..

E. Bolting materials: 304 stainless steel bolts and hex nuts, ASTM F593, for all flanged and/or grooved type pipe, fittings and valves.

F. Pipe joints for 2-1/2" through 10": Butt weld to ANSI B31.1 and MCAA Part VII, Standard Procedure Specification Parts 1 & 2.
   1. Grooved joints in domestic/lab/non-potable and chilled water pressurized systems shall only be permitted where the joints are located to be readily accessible or provided with service access, and where a minor leak or seepage would not cause significant damage or loss.

2. Grooved joint: ASTM A536 Ductile Iron coupling, ASTM B633 and ASTM A183 bolts and nuts with minimum tensile strength of 10,000 psi, ASTM D2000 rubber gaskets selected for service application. Roll groove method only. Cut groove shall be utilized for applications where piping has interior lining or coating, including galvanized systems.

G. Pipe joints for 2" and smaller: Threaded using American Standard for Pipe Threads, ANSI B2.1 with thread sealant or Teflon tape material especially listed compatible with system contents, pipe materials, and operating conditions.

H. Thread lubricant: (NOTE: Approved Teflon tape may be used except on natural gas piping.)

I. Gaskets: 1/8" thick Cranite, Sepco, or prior approved equal.

2.3 COPPER PIPE

A. Manufacturers for Copper Piping and Fittings: Anderson Metals Corp., Brasscraft, Mueller Brass, Elkhart, Milwaukee, Nibco, Anaconda, or prior approved equal.

B. Chilled Water Supply and Return, Make-up Water, Heating Hot Water and Condensate Drain.

1. 2" and smaller: Type L, hard drawn, seamless, conforming to ASTM B88

C. Refrigerant

1. 2" and smaller: Seamless copper tube, ASTM B88, ASTM B280 type ACR, Type L.

2.4 COPPER PIPE FITTINGS

A. Sweat type, wrought copper, ASTM B62, with dimensions conforming to ANSI B16.22 and sweep patterns for copper tubing.

B. Dielectric connections: Epco Sales, Inc., or "V-line" (as manufactured by Lochinvar Company) dielectric couplers. Use couplers at junction of steel pipe and equipment with copper piping systems. Do not use steel or cast iron fittings in copper piping system. Brass fittings shall be used for dielectric locations. Dielectric flange kits at dissimilar metal flange connections.

C. Unions: Brass ground joint, 250 lb. working pressure.

D. Nipples: Brass.

2.5 MISCELLANEOUS PIPE ACCESSORIES

A. Sleeves: Schedule 10 or 40 steel pipe or 16 gauge galvanized sheet metal, except use 18 gauge galvanized sheet metal for floor penetrations in mechanical rooms.

B. Escutcheons: Chrome pipe escutcheons, slip-on or split type where pipe passing through finished walls may be visible. Escutcheons are not required in mechanical rooms and janitor closets.

C. Exposed Metal Pipe and Trim in administrative and public areas: Chrome plated.

D. Pipe saddles to be 16 gauge galvanized installed to protect insulation as required by appropriate section of this chapter.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. Clean inside of pipe before installing. Keep installed piping clean, and protect ends from foreign matter by capping or plugging them.

B. Install pipe so that it does not interfere with: Opening of doors or apparatus; Access to equipment; Any portion of electrical equipment.

C. Run pipes in straight lines and square with building. Install rise plumb. Make offsets only where indicated and where necessary.

D. Install pipes so that expansion and contraction will not cause undue stress or strain to pipes or equipment. Provide loops, offsets, and expansion joints as shown on drawings. If, in Contractor's opinion, inadequate loops or offsets are shown, contact Architect for instructions.

E. Provide flanges and unions throughout the pipe systems to make installation and removal of piping and equipment convenient. Make provisions for servicing and removal of equipment without dismantling piping.

3.2 PIPE JOINTING

A. Preparing Pipe Ends:
   1. Cut pipe ends square with pipe cutters only. Do not use hacksaws or torch.
   2. Ream pipe ends, after cutting, to full diameter.
   3. Where pipe is to be threaded, die-cut right hand, pipe stand, clean cut full depth, taper threads. Make threaded joints so that they will be leakproof without caulking.
   4. Apply a thin coat of approved pipe lubricant to make threads only.

B. Soldered and Brazed Joints:
   1. Make soft copper pipe joints with suitable flux and 95/5 solder.
   2. Potable water systems including all pipe joints shall be lead free.
   3. ALL CHILLED WATER, HEATING HOT WATER, CONDENSER WATER, AND REFRIGERANT PIPING SHALL BE BRAZED ONLY.

3.3 ESCUTCHEONS

A. Provide chrome plated escutcheons where uninsulated pipes penetrate walls of finished spaces.

3.4 VALVE ACCESS

A. Locate shut off and control valves for easy access and operation. Refer to Section 08 for access door requirements.

3.5 CONTROL SYSTEMS CONNECTORS

A. Weld connectors at points indicated, and at other points where necessary for installation of thermometers and automatic controls.

3.6 RECHECKING AND REPAIRING

A. Before piping is concealed, recheck for leaks.

B. Rework or replace defective and leaking joints, and joints which are otherwise unsatisfactory. Peening, caulking, and doping are not permitted.

END OF SECTION

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SECTION 23 0523
VALVES

PART 1 - GENERAL

1.1 PROVISIONS

A. Requirements of the General Provisions apply to all work under this section.

B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition.

1.2 DESCRIPTION

A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.

B. The work described in this section of the specifications includes but is not limited to the following:
   1. Valves for mechanical piping systems as specified herein and as indicated on the drawings, complete with all unions, supports and accessories necessary for fully functional piping systems.

1.3 RELATED WORK

A. The following items of related work are specified and included in other sections of these specifications:
   1. Section 22 05 00 - General Requirements.
   2. Section 23 05 16 - Piping and Fittings
   3. Section 23 05 93 - Testing Adjusting and Balancing.
   4. Section 23 07 00 - Mechanical System Insulation.

1.4 SUBMITTALS

A. Submit seven copies of all valves for review by the Engineer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Certain items in this Specification are listed by manufacturer and/or manufacturer's model number to establish general style, type, character and quality of the product desired. Similar items manufactured by other than those listed will be considered, providing submittals are made according to Pre-Bid Approval requirements of Instructions to Bidders.

B. Where no manufacturer or model number are given, any product meeting performance or design criteria, or referenced trade association standard may be used and Pre-Bid Approval is not required.

C. Manufacturers: Subject to compliance with requirements for complete systems provide products of one of the following:

2.2 APPLICABLE PUBLICATIONS

A. The following publication form a part of the specifications. The publications are referenced in the text by basic designation only.
   1. Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc.
      a. SP-80-87 Bronze Gate, globe, Angle and Check Valves.
      b. SP-70-90 Cast Iron Gate Valves, Flanged and Threaded Ends.
      c. SP-67-95 Butterfly Valve.
   2. Federal Specification (Fed, Spec.)
      a. WW-V-35C Valve, Ball.

2.3 VALVES

A. Gate Valves: MSS SP-80, 125# SWP solder joint for water lines 2-1/2" to 3" in diameter; body and bonnet shall be of ASTM B-62 cast bronze composition, solid disc, copper-silicon alloy stem, brass packing gland, Teflon-impregnated packing, and malleable handwheel. Stockham G-612 for valves larger than 3" in diameter shall be Class 125 iron body, bronze mounted, with body and bonnet conforming to ASTM A-126, Class B cast iron, flanged ends, with Teflon impregnated packing and two-piece packing gland assembly.

B. Check Valves: MSS SP-80, 125# SWP, solder joint for water lines up to 2" in diameter with body and caps conforming to ASTM B-62, cast bronze composition and swing type disc. Stockham G-931, iron body, bronze mounted with body and caps conforming to ASTM A-126, Class B cast iron, flanged ends, swing type service for all valves larger than 2" in diameter.

C. Globe Valves: MSS SP-80, 125# SWP solder joint, body and bonnet of ASTM B-62 bronze composition, copper-silicon-bronze stem, brass packing gland, Teflon impregnated packing, and malleable handwheel for water lines up to 2" in diameter. MSS SP-80 for valves larger than 2" in diameter shall be Class 125, iron body, bronze mounted, with body and bonnet conforming to ASTM A-126, Class B cast iron, flanged ends, with Teflon impregnated packing, and two-piece packing gland assembly.

D. Ball Valves: Spec.WW-V-35, Class A for water lines up to 2" in diameter solder end joints with extended solder cups shall be 600 psi CWP, cast brass body, replaceable reinforced Teflon seats, conventional port, blowout-proof stems, and chrome-plated brass ball.

E. Butterfly Valves: MSS SP-67

1. MSS SP-67, cast iron body, aluminum-bronze disc, EPDM seat, fully lugged, 200 lb., suitable for pneumatic actuator. Unless automatic operation is called for, provide manual operator as follows:
   a. Size 4 Inch and Smaller: Lever with adjustable memory stop.
   b. Size 5 Inch and Larger: Gear operator with crank or wheel, cast iron housing and handwheels.

F. Balancing Valves:
1. Circuit setter calibrated balancing valve with calibrated nameplate and memory stop indication. Valve may be preset to a fixed open position and then closed for service without disturbing valve setting. Working pressure shall be 175 psig. Valve shall have standard cut groove or flanged type connections.
2. Valve body & bonnet to be cast iron if flanged and ductile iron if grooved connections. Disc to be bronze and stem to be stainless steel. Packing or gaskets to be asbestos free.
3. Acceptable manufacturer's include Bell and Gossett, Armstrong and Taco.

G. Automatic Flow Control Valves
1. Application: Automatic flow control valves shall be used on all HVAC equipment including but not limited to: Air Handlers, Fan Coils, Pumps, VAV's, etc.
2. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to manufacturers specified.
   a. Hays Fluid Controls
   b. Griswold Controls
   c. Flow Design
   d. AutoFlow
3. Body: Brass or ferrous metal.
4. Piston and spring assembly: Stainless steel, corrosion resistant, tamperproof, self cleaning and removable.
5. Combination Assemblies: Include bronze or brass-alloy ball valve.
6. Identification Tag: All valves shall be marked with direction of flow arrow, size, flow rate, manufacturer, and model number.
7. Size: Line sizes 1-1/2" and smaller will be automatic balancing valve hose kits without the control valve. For line sizes 2" and greater will be 2 or 3 way automatic balancing valve kits.
8. Performance: Control the flow to within +/- 10% of the rated flow, over a temperature range of 32 °F to 225°F, and a pressure differential of 2 to 80 psid.
9. Minimum Working Pressure Rating: 150 psig. Maximum Operating Temperature: 225 °F

H. Refrigerant valves shall be as manufactured by Sporlan or equal and shall be approved by the manufacturer for the pressure and refrigerant type and service of the application.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Locate valves so as to be accessible by maintenance personnel.

B. Install accessible valve and union at each equipment connection.

C. Coordinate location of valved outlets for mechanical equipment with Mechanical Contractor.

D. Install chrome-plated escutcheon plates at all wall penetrations exposed to view.

END OF SECTION

SECTION 23 0548
VIBRATION ISOLATION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This section provides minimum acceptance requirements for vibration isolation for all mechanical equipment, ductwork and piping.

1.2 RELATED WORK SPECIFIED ELSEWHERE

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

B. Ductwork flexible connections are specified elsewhere in Division 23.

C. Vibration isolation for electrical systems is provided in Division 26.

1.3 DEFINITIONS

A. IBC: International Building Code.

B. ICC-ES: ICC-Evaluation Service.

C. ASHRAE: American Society of Heating, Refrigerating and Air-Conditioning Engineers.

D. OSHA: Occupational Safety and Health Administration.

1.4 QUALITY ASSURANCE

A. Unless otherwise directed by the local authority having jurisdiction, the following codes and standards will apply:
   1. International Building Code 2012
   2. American Society of Civil Engineers 7-05
   3. Manufacturer's Standardization Society MSS-58-2002

B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.5 SUBMITTALS

A. Submit shop drawings for all devices specified herein and as indicated on the drawings. Submittals shall include dimensions, materials, attachment and anchorage requirements. Indicate compliance with each specification item herein.

B. Delegated-Design Submittal: For vibration isolation details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
   1. Design Calculations: Calculate static and/or dynamic loading due to equipment weight and operation to select vibration isolators and for designing vibration isolation bases.
   2. Riser Supports: Include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on building structure and spring deflection changes. Include certification that riser system has been examined for excessive stress and that none will exist.
   3. Vibration Isolation Base Details: Detail overall dimensions, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, base weights, equipment static loads, power transmission, component misalignment, and cantilever loads.

C. Welding certificates.

D. Qualification Data: For professional engineer and testing agency.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Certain items in this Specification are listed by manufacturer and/or manufacturer's model number to establish general style, type, character and quality of the product desired. Similar items manufactured by other than those listed will be considered, providing submittals are made according to Pre-Bid Approval requirements of Instructions to Bidders.

B. Where no manufacturer or model number are given, any product meeting performance or design criteria, or referenced trade association standard may be used and Pre-Bid Approval is not required.

C. Manufacturers: Subject to compliance with requirements for complete systems provide products of one of the following and all vibration isolation systems shall be by one manufacturer. Approved vibration isolation manufacturers are as follows:
   1. Vibro-Acoustics.
   2. Mason Industries.
   3. Amber-Booth
   4. Kinetics
   5. Or prior approved equivalent.

2.2 VIBRATION ISOLATORS AND MOUNTINGS

A. General

1. Unless otherwise specified in this Division all machinery or vibrating mechanical equipment shall be isolated from the building structure by vibration isolators with a minimum deflection as specified. Operating equipment that can transmit objectionable vibration and noise must be installed with special types of vibration isolators such as flexible connectors to ductwork, piping and wiring. In more critical areas and under particular conditions, additional vibration isolators shall be installed as specified in other related Sections in this Division, or in specific equipment schedules.
2. All equipment shall be provided with attachment points for floor or suspended mounting that will safely transmit all loads to the supports.
3. The vibration isolator manufacturer shall be responsible for the proper selection of vibration isolators suitable for the particular application. Selection of the vibration isolator shall include the following factors:
   a. Equipment Weight
   b. Equipment operating frequencies
   c. Type of building support structure
4. Unless otherwise noted, vibration isolators shall be furnished by the vibration isolation manufacturer.
5. All floor mounted vibration isolators shall be bolted to the floor or framing on which they rest. Bolts shall be arranged to prevent transmission of vibration through the bolts.
6. All springs shall have a minimum additional travel to solid equal to 50% of the rated deflection. All springs except internal nested springs shall have an outside diameter not less than 0.8 of the compressed height of the spring. Ends of springs shall be square and ground for stability. Laterally stable springs shall have kx/ky ratios of at least 0.9. All springs shall be fully color-coded to indicate capacity - color striping is not considered adequate.
7. Bases shall be of welded construction with cross members to form an integral support platform. Structural steel members shall be designed to match supported equipment. Vibration bases for fans shall have adjustable motor slide rails, and shall accommodate motor overhang. Bases for exterior use shall be painted or hot-dipped galvanized for complete corrosion resistance.
8. All isolation devices for a single piece of equipment shall be selected for a uniform static deflection according to distribution of weight in the equipment.
9. All pieces of equipment that have a variation in weight during operation or maintenance such as, but not limited to, cooling towers, shall have built-in vertical limit restraints to limit motion to a maximum of 1/4-in.
10. Equipment with large variations in the operating and installed weight, such as chillers, boilers, etc., shall be mounted on spring mountings, including a neoprene acoustical pad within a rigid sided housing that includes vertical limit stops to prevent spring extension when weight is removed and temporary steel spacers between the upper and lower housings. Housings shall serve as blocking during erection. When the equipment is at full operating weight, the springs shall be adjusted to assume the weight and the spacers removed, without changing the installed and operating heights. All restraining bolts shall have large rubber grommets to provide cushioning in the vertical as well as horizontal modes. The hole through the bushing shall be a minimum of 0.75"

larger in diameter than the restraining bolt. Horizontal clearance on the sides between the spring assembly and the housing shall be a minimum of 0.5" to avoid bumping and interfering with the spring action. Vertical limit stops shall be out of contact during normal operation.

11. Isolators exposed to the weather or in damp, wet, or corrosive environments shall be provided with corrosion protection. Steel parts other than springs shall be hot-dipped galvanized. Parts subject to wear, rubbing, shall be non-corrosive material such as rubber or stainless steel. Springs and hardware shall be cadmium plated or otherwise provided with an approved coating.
12. After installation of equipment, isolators shall be adjusted for proper loading and distribution of weight.
13. Select and locate vibration isolation equipment to give uniform loading and deflection, according to weight distribution of equipment.
14. Unless otherwise noted, minimum static deflection for spring-type isolators shall be 1 inch.
15. Unless otherwise noted, all internally isolated air handling units shall be provided with minimum 1" thick, oil resistant, solid neoprene pads. Pads shall be located between the air handling unit base rail and the emergency drain pan.
16. Air handling units with independently mounted fan sections shall be provided with tension adjustable thrust restraints to counteract reaction forces due to air flow. Restraints shall be arranged to allow a maximum 1/4-in of motion at start-up or shutdown.
17. Floor mounted fans shall be provided with structural steel vibration bases common to both fan and motor. Slab-on-grade installations shall be provided with spring-type isolators with a minimum 1" static deflection. Above-grade installations shall be provided with spring-type isolators with a minimum 2" static deflection. There shall be a minimum operating clearance of 1" between each steel base and the structure.
18. All floor-mounted pumps shall be mounted on concrete-filled inertia bases. Concrete in-fill shall be supplied by the installing contractor on site. Inertia bases shall be arranged with spring isolator locations such that a horizontal plane passing through the top of the isolators will pass through or above the center of gravity of the equipment and base. Slab-on-grade installations shall be provided with spring-type isolators with a minimum 1" static deflection. Above-grade installations shall be provided with spring-type isolators with a minimum 2" static deflection. There shall be a minimum operating clearance of 2" between each inertia base and its foundation.
19. Engine-generator sets shall be supported with spring-type isolators with a minimum 3" static deflection. There shall be a minimum operating clearance of 2" between each inertia base and its foundation.
20. Engine-generator set silencers and associated exhaust piping shall be supported with spring-type isolators with a minimum 1.5" static deflection.
21. Skid-mounted air compressors shall be supported with housed spring-type isolators. Slab-on-grade installations shall be provided with spring-type isolators with a minimum 1" static deflection. Above-grade installations shall be provided with spring-type isolators with a minimum 2" static deflection.

22. Extent of Piping Isolation:
    a. Isolate all piping between 2" and 10" dia. and directly connected to motorized and/or vibration isolated equipment with 1" static deflection spring hangers.
    b. Isolate all piping larger than 10" dia. and directly connected to motorized and/or vibration isolated equipment with 2" static deflection spring hangers.
    c. Spring hangers shall be spaced at intervals in accordance with the following:

Pipe Diameter	Distance from Vibrating Equipment
2" to 4"	50'
6" and 8"	60'
10" and larger	70'

23. Chilled, Condenser, and Domestic Cold and Hot Water Piping:
    a. Horizontal:
        1) Pipe stand supports shall be supported on isolators. The first 3 isolators shall have the same minimum static deflection as the equipment isolators. The remaining isolators shall have a minimum 1" static deflection.
        2) Piping shall be suspended with isolators. The first 3 hangers shall have the same minimum static deflection as the equipment isolators, with a maximum of 2". The remaining isolators shall have a minimum 1" static deflection.
    b. Vertical:
        1) Piping shall be isolated from the supporting members or structure with isolators with a minimum 1" static deflection.
24. Extent of Ductwork Isolation:
    a. Provide vibration isolation for ductwork as required.
    b. Floor-supported ductwork shall be isolated from the structure with isolators with minimum 1" static deflection.
25. There shall be no direct contact of isolated piping, ductwork, or equipment with shaft walls, floor slabs, partitions, or conduits.
26. Provide height saving brackets where recommended by the manufacturer for equipment stability, or operating height requirements.
27. Where recommended by the manufacturer, isolator base plates shall be bolted to the structure or foundation. Bolting shall incorporate neoprene bushings and washers.
28. Provide spring-loaded thrust restraints for fans and air handling units where movement under any operating condition will exceed 0.375".
29. Isolation hangers shall be installed with the housing a minimum of 1/4" below but as close to the structure as possible. Where isolator hangers would be concealed by non-accessible acoustical sub ceiling, install the hangers immediately below the sub ceiling for access.

B. Vibration Isolation Types
   1. Isolation Types for Floor Mounting
      a. Single elastomer-in-shear isolators, molded mound shaped element designed for 1/4-in deflection under the imposed static load. Double elastomer-in-shear isolators shall be two such elements assembled in series or a molded element designed to provide 1/2-in deflection under the imposed static load. Elastomer-in-shear isolators shall be properly housed to prevent bulging and shall be provided with adequate facilities for bolting to equipment and floor slab.
      b. Spring isolators shall be free standing and laterally stable and shall be equipped with acoustical-friction pads, leveling bolts and bolt holes for anchoring to floor slab. Springs shall have a minimum ratio of outside diameter to operating spring height of 0.8 and an additional travel to solid equal to 50 percent of the specified deflection. Where housed springs are specified or required, provide units with telescoping cast iron or steel housing, containing one or more springs, complete with resilient alignment insert and a minimum of 1/4" thick rubber or neoprene sound deadening pad bonded to the base of housing. Spring isolators shall have a minimum overload capacity of 200 percent of rated load, fully compressed, without deformation or failure.
      c. Heavy load pads shall be minimum 1-1/4" thick and shall consist of a high load capacity elastomer pad and sandwiched between two 1/8-in thick steel load distribution plates capable of supporting loads up to 250 psf. For large pad area, steel plates of suitable thickness shall be provided to distribute the load.
      d. Light load pads shall be minimum 3/4" thick solid neoprene corrugated single or laminated double, oil resistant neoprene. Pads shall be capable of loading to 50 psf.
   2. Isolation Types for Suspension
      a. Isolation hangers for suspension of equipment and piping shall have a single element of elastomer for 1/4-in deflection, a double or a single molded element for 1/2-in deflection, a single spring element with an elastomer grommet for 3/4-in deflection and a combination of an elastomer and spring elements in series for a deflection of 1" and above; elastomer and spring elements shall be contained within a structural rigid one piece steel hanger box. Springs shall have a minimum ratio of outside diameter to operating spring height of 0.8 and an additional travel to solid equal to 50 percent of the specified deflection.
      b. The neoprene element shall have a bushing to prevent hanger rod contact with the housing box. The lower rod shall be free to swing in a 30 degree arc without touching the spring or the housing.
   3. Rails and Bases - Rails and bases shall be of the following types based on the equipment and deflection required.

a. Rubber in shear type shall be steel rails running the full length of the supported equipment and extending under any overhang to counteract cantilever effects. The rails shall incorporate single or double deflection elastomer-in-shear fastened in place and a continuous steel floor bearing plate running the full length of each rail. The rails shall be drilled and tapped to accept the supported equipment and shall serve as a template.
b. Steel spring type shall be steel rails running the full length of the supported equipment and extending under any overhang to counteract cantilever effects. The rails shall consist of structural members supported by individual free standing springs. The rails shall be drilled to accept the supported equipment and shall serve as a template.
c. Fans and their driving motors shall be mounted on structural steel channel members forming a rigid base. A common member, parallel to the V-belt drive, shall run the full length of the fan and motor and shall be of sufficient rigidity to resist the bending stress of belt pull. The structural steel base shall incorporate single or double deflection elastomer-in-shear elements or free standing springs located for proper weight distribution. The base shall be drilled and tapped to accept the fan and motor and shall serve as a template. Integral motor slide rails shall be provided and welded in place.
d. Inertia bases shall be of welded steel construction with concrete in-fill supplied by the installing contractor on site and shall incorporate 15M (No.4) reinforcing bars, welded 12" maximum on centers each way.
   1) Inertia bases for pumps shall be of sufficient size to accommodate supports for pipe elbows at pump suction and discharge connections.
   2) Inertia bases for fans shall include motor slide rails.
   3) The weight of each inertia base shall be at least equal to the weight of the equipment mounted thereon or sufficient to lower the center of gravity to or below the isolator support plane.
   4) Inertia bases shall be a minimum of 6" thick.
   5) Height-saving brackets or welded steel pockets shall be incorporated to maintain a 1" minimum clearance under each inertia base.
   6) Wooden formed bases leaving a concrete rather then a steel finish are not acceptable.

4. Isolation for Piping
   a. Flexible piping for systems with operating temperatures over 200 degrees F shall be stainless steel braided annular flexible hose. The hose shall be provided with an external stainless steel braid to minimize elongation under pressure. Hoses 2-1/2-in and smaller shall be threaded and hoses 3-in and larger shall be flanged. Flanged hoses shall be provided with a fixed, raised plate flange on one end and a floating flange on the other. The manufacturer shall confirm the suitability of the flexible piping for the temperature and pressure of the systems.
   b. Rubber expansion joints shall be peroxide cured EPDM throughout with Kevlar tire cord reinforcement. Substitutions must have certifiable equal or superior characteristics. The raised face rubber flanges must encase solid steel rings to prevent pull out. Flexible cable wire is not acceptable. Sizes

1-1/2" through 14" shall have a ductile iron external ring between the two spheres. Sizes 16" through 24" may be single sphere. Sizes 3/4" through 2" may have one sphere, bolted threaded flange assemblies and cable retention. Provide control cables to prevent excessive elongation on straight connection where required. The manufacturer shall confirm the suitability of the connections for the temperature, pressure, and pipe contents for the systems. Minimum ratings through 14" shall be 250psi at 170°F and 215psi at 250°F. 16" through 24" 180psi at 170°F and 150psi at 250°F. Higher published rated connectors may be used where required. Safety factors shall be a minimum of 3/1. All expansion joints must be factory tested to 150% of maximum pressure for 12 minutes before shipment. The piping gap shall be equal to the length of the expansion joint under pressure. Control rods passing through 1/2" thick Neoprene washer bushings large enough to take the thrust at 1000 psi of surface area may be used on unanchored piping where the manufacturer determines the condition exceeds the expansion joint rating without them. Submittals shall include two test reports by independent consultants showing minimum reductions of 20 DB in vibration accelerations and 10 DB in sound pressure levels at typical blade passage frequencies on this or a similar product by the same manufacturer. All expansion joints shall be installed on the equipment side of the shut off valves.

c. Flexible stainless steel hose shall have stainless steel braid and carbon steel fittings. Sizes 3" and larger shall be flanged. Smaller sizes may have male nipples. Minimum lengths shall be as tabulated:

Flanged

3" x 12" (75 x 300mm)	6" x 18" (150 x 450mm)	12" x 24" (300 x 600mm)
4" x 12" (100 x 300mm)	8" x 18" (200 x 450mm)	14" x 30" (350 x 750mm)
5" x 18" (125 x 450mm)	10" x 18" (250 x 450mm)	16" x 32" (400 x 800mm)

Male Nipples

1/2" x 12" (12 x 300mm)	1-1/4" x 12" (32 x 300mm)	2" x 12" (50 x 300mm)
3/4" x 12" (19 x 300mm)	1-1/2"x 12" (38 x 300mm)	2-1/2" x 18" (64 x 450mm)
1" x 12" (25 x 300mm)		

d. At equipment, hoses shall be installed on the equipment side of the shut-off valves horizontal and parallel to the equipment shafts wherever possible.

C. Rigidly Mounted Equipment
1. When equipment doesn't require vibration isolation, it shall be firmly attached to the building structure.

2.3 NOISE CRITERIA

A. The selection of pumps, fans, air handling equipment, air conditioners, heating ventilating and air conditioning machinery and mechanical equipment and the installation of the system components such as duct work and piping shall be such as not to exceed noise guidelines as defined in Chapter 47 of the 2007 edition of

the ASHRAE HVAC Applications Handbook. Under no conditions shall the noise created by equipment exceed the levels of permissible noise exposures of occupational areas as established by the OSHA and other Federal, State and local safety and health standards, codes and ordinances.

B. The equipment supplier shall provide actual noise data for the equipment submitted. If the space does not meet the required criteria, and the noise level of the equipment is found to be the cause, the equipment supplier shall be responsible for the modifications required to correct the condition.

2.4 FACTORY FINISHES

A. Finish: Manufacturer's standard prime-coat finish ready for field painting.

B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
   1. Powder coating on springs and housings
   2. All hardware shall be galvanized. Metal components for exterior use shall be hot-dip galvanized.
   3. Baked enamel or powder coat for metal components on isolators for interior use.
   4. Color-code or otherwise mark vibration isolation devices to indicate capacity range.

PART 3 - EXECUTION

3.1 GENERAL

A. Coordinate size, doweling, and reinforcing of concrete equipment housekeeping pads and piers with vibration isolation to ensure adequate space and prevent edge breakout failures.

B. Coordinate locations and sizes of structural supports with locations of vibration isolators (e.g., roof curbs, cooling towers, air-cooled chillers, etc.).

3.2 VIBRATION ISOLATION

A. Block and shim all bases level so that all ductwork and piping connections can be made to a rigid system at the proper operating level, before isolator adjustment is made. Ensure that there is no physical contact between isolated equipment and the building structure.

B. Ensure housekeeping pads have adequate space to mount equipment and isolator housings and shall also be large enough to ensure adequate edge distance for isolator anchor bolts to avoid housekeeping pad breakout failure.

3.3 ADJUSTING

A. Adjust isolators after piping system is at operating weight.

B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

C. Adjust active height of spring isolators.

3.4 INSPECTION AND CERTIFICATION

A. After installation, arrange and pay for the vibration isolation product manufacturer to visit the site to verify that the vibration isolation systems are installed and operating properly. Vibration isolation product manufacturer shall submit a certificate stating that the vibration isolation systems are installed and operating properly.

B. Verify that isolators are adjusted with springs perpendicular to bases or housing, adjustment bolts are tightened up on equipment mountings, and hangers are not cocked.

C. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

D. Tests and Inspections:
   1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
   2. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
   3. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
   4. Test to 90 percent of rated proof load of device.
   5. Measure isolator deflection.
   6. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.

E. Remove and replace malfunctioning units and retest as specified above.

F. Prepare test and inspection reports.

END OF SECTION

SECTION 23 0593
HVAC TESTING, ADJUSTING AND BALANCING REQUIREMENTS

PART 1 GENERAL

1.1 PROVISIONS

A. Requirements of Division 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Architect for consideration in accordance with Division 01. Those judged to be equal to that specified, will receive written approval.

1.2 DESCRIPTION

A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.

B. The work described in this section of the specifications includes, but is not limited to, the following:
   1. Contractor shall provide air balance report for the existing (as-built) conditions for all HVAC air and water distribution systems serving the third, fourth and sixth floors which will be affected by the renovation project. Report shall include existing equipment and performance data. Equipment, duct and piping layouts shown on drawings are from best available information. Contractor shall field verify actual conditions and submit updated electronic drawings, with TAB report, which identify discrepancies from the contract documents.
   2. Replacement of all sheaves and belts for equipment listed in the Lab Exhaust Fan Schedule (Existing) and in the Air Handling Unit Schedule (Existing) after the Pre-Demolition / Pre-Construction conditions are measured and the findings have been assessed by the Architect.
   3. Testing, adjusting and balancing of new and existing HVAC systems and equipment to demonstrate proper operation.

1.3 RELATED WORK

A. The following items of related work are specified and included in other sections of these specifications:
   1. Section 20 01 00 - General.
   2. Section 23 06 30 - Cleaning Mechanical Systems.
   3. Section 23 05 16 - Piping and Fittings.

4. Section 23 05 95 - HVAC Testing, Adjusting and Balancing Procedures

1.4 SUBMITTALS

A. Submit Air Balance data in accordance with Section 23 0595.

1.5 COORDINATION

A. Advise Architect of scheduled systems testing and completed system demonstration/operation schedules so that he may witness, if desired.

1.6 QUALITY ASSURANCE

A. The TAB (Testing and Balancing) contract shall be between the Contractor and the TAB firm.

B. All TAB deficiencies shall be corrected when found. Any deficiencies that are (for whatever reason) not corrected immediately shall be shown in the TAB report and listed on a summary sheet in the front of the TAB report. The TAB report must be completed and accepted by the Architect before the project is accepted and all items on the summary sheet shall become punch list items with dollar values assigned to them.

C. TAB firms shall be certified by either the AABC (Associated Air Balance Council) or the NEBB (National Environmental Balancing Bureau).

D. Below is a partial list of TAB firms serving the State of Louisiana. This list is provided for reference only.

Firm Name	Voice Number	FAX Number
Coastal Air Balance, Inc. (Metairie)	504-834-4537	504-834-2361
Consolidated Balancing Services (Metairie)	504-455-4944	504-887-1972
Tech Test, Inc. of Louisiana (Baton Rouge)	225-752- 1664	225-752-0295
Acadian Air Balance, Inc. (Lafayette)	318-237-6494	318-237-6463
Certified Balance, Inc. (Monroe)	318-387-1550	318-322-4251
Edmonds Engineering Services (Shreveport)	318-687-4470	318-687-8945
Oxner Engineering (Shreveport)	318-424-9259	318-222-7254

1. Verification of TAB firm certification may be confirmed by contacting the certification agencies at the telephone numbers shown below:
   a. NEBB at 301-977-3698
   b. AABC at 202-737-0202

E. At the time of final inspection, the TAB agency may be required to recheck, in the presence of the Owner's representative, specific and random selections of data, air quantities, and air motion recorded in the certified report. Points and areas for recheck shall be selected by the owner's representative. Measurements and test procedures shall be the same as approved for the initial work for the certified report. Selections for recheck, specific plus random, shall not exceed 10% of the total number tabulated in the report.

F. Shop drawings must be provided to the TAB firm no later than 30 days after the final, approved shop drawings have been returned by the Architect to the Contractor.

G. Coordination between the TAB firm and the Contractor shall be left strictly to those parties.

H. The Contractor shall conduct pressure tests of supply, return, outside air and exhaust ductwork to quantify the leakage rate of the installed systems. Unless otherwise noted, duct sealing and leakage tests shall be conducted to meet or exceed the minimum requirements per ANSI/ASHRAE/IESNA Standard 90.1-2007, Section 6.4.4.2 "Ducts and Plenum Leakage". Ductwork shall be fabricated and installed in accordance with SMACNA standards.

DUCT SEAL AND LEAKAGE CLASSES		
	Duct Pressure Classification (Rated Static Pressure)	
	less than 3 in.w.g.	3 in.w.g. and above
Required Seal Class	B	A
Required Sealing	All traverse joints and longitudinal seams.	All traverse joints, longitudinal seams and duct wall penetrations
Required Leakage Class Rectangular Metal	6	6
Required Leakage Class Round Metal	3	3

I. Fire and smoke damper testing shall be done by the Contractor and witnessed by the TAB firm.

PART 2 PRODUCTS

2.1 INSTRUMENTS

A. All instruments used by the Air Balancer shall be accurately calibrated within the past calendar year and maintained in good working order.

PART 3 EXECUTION

3.1 TESTING - GENERAL

A. Test existing systems and equipment installed to demonstrate proper operation.

B. Test new systems and equipment installed to demonstrate proper operation.

C. Submit notices of readiness for testing to Architect and other appropriate people.

D. Correct and retest work found defective when tested.

E. Make repairs to air and water systems with new materials. Peening, doping or caulking of joints or holes will not be acceptable.

3.2 AIR SYSTEMS AND AIR DISTRIBUTION TEST AND BALANCE

A. Perform HVAC system test and balance in accordance with Section 23 0595.

3.3 CONDENSATE DRAIN PIPING

A. Test plug opening to permit system to be filled with water to drain pan level. System shall hold water for four hours with no drop in water level.

3.4 RECORDS OF TESTING

A. Maintain records of system testing and results thereof. Deliver to Architect as part of the maintenance and operation manual.

END OF SECTION

SECTION 23 0595
HVAC TESTING, ADJUSTING AND BALANCING PROCEDURES

PART 1 GENERAL

1.1 PROVISIONS

A. Requirements of Section 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Those judged to be equal to that specified, will receive written approval. The testing agency shall be certified by either AABC or NEBB.

1.2 DESCRIPTION

A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.

B. The work described in this section of the specifications includes but is not limited to the following:
   1. Testing and balancing services by an AABC or NEBB certified independent air balance and testing agency to include adjusting and testing of air-moving equipment and air distributing or exhausting systems as herein specified.
   2. Air-moving equipment and air distributing or exhausting systems as herein specified.
   3. All water coils.

1.3 RELATED WORK

A. The following items of related work are specified and included in other sections of these specifications:
   1. Section 23 0630 - Cleaning Mechanical Systems.

1.4 SUBMITTALS

A. Submit seven copies of the air balance report to the Engineer for review one week (7 days) after the air balance agency completes the balancing work.

B. Submit within 15 days after receipt of the contract, 7 copies of submittal data for the testing and balancing of the air conditioning and ventilating systems.

C. The balance agency shall provide proof of having successfully completed at least five projects of similar size and scope.

D. Submit all instruments for use on the project.

E. Submit the test and balance contract to the Engineer for approval within 90 days after the Air Conditioning Contractor has received his contract to proceed with the air conditioning installation to allow the air balance agency to schedule this work in cooperation with other trades involved and comply with the completion date.

1.5 REFERENCE STANDARDS

A. Published specifications standards, tests or recommended methods of trade, industry or governmental organizations apply to work in this section where cited below:
   1. AABC - Associated Air Balance Council.
   2. NEBB - National Environmental Balancing Bureau.
   3. SMACNA - Sheet Metal and Air Conditioning Contractors National Association, Inc.

1.6 QUALITY ASSURANCE

A. The testing agency shall be one which specializes in the balancing and testing of heating, ventilating and air conditioning systems.

B. All work shall be done under direct supervision of a qualified heating and ventilating certified technician employed by the agency. If requested, conduct the tests in the presence of the Engineer and/or his representative.

C. Follow procedure and use forms established by the AABC.

PART 2 PRODUCTS

2.1 INSTRUMENTS

A. All instruments used by this agency shall be accurately calibrated and maintained in good working order. As a minimum the following shall be owned and used by the Balance Contractor:
   1. 4" vane anemometers.
   2. Air velocity gauges.
   3. 10 incline vertical manometers.
   4. Magnehelic gauges.
   5. Sling psychrometers.
   6. Test thermometers.
   7. Ammeters.
   8. A.B. Strobotac.
   9. Four-point temperature analyzers.
   10. Compound test gauges.
   11. Carbon dioxide indicator fyrite.
   12. Smoke bombs.
   13. Two-way radios.
   14. Sound meter with octave bank analyzer.
   15. Flow hoods.

16. Hot wire anemometers.
17. Electronic rotating vane anemometers.
18. Electronic thermometers.
19. Electronic micromanometer.

PART 3 EXECUTION

3.1 COORDINATION

A. Do not begin air or water balance and testing until system has been completed and is in full working order.

B. Put all heating, ventilating and air conditioning systems and equipment into full operation and continue the operation of same during each working day of testing and balancing.

3.2 BALANCING

A. Upon completion of the air conditioning system, the air balance agency shall perform the following test, compile the test data, and submit seven (7) copies of the complete test data for forwarding to the Engineer for review and approval, including dates, time, personnel, status of operating of cooling or heating.

B. Testing Procedure: The air balance agency shall perform the following tests, and balance system in accordance with the following requirements:

C. Test, Adjust and Balance Procedure - Air Distribution Systems:
1. Phase I: (As Applicable)
   a. All supply and return air duct dampers are set at full open position.
   b. All diffuser and sidewall registers are set at full open position.
   c. Outside air damper is set at minimum position.
   d. All controls checked and set for full cooling cycle.
   e. Branch line splitter dampers are set to open position.
   f. Set all extractors and distribution grids in wide open positions.
2. Phase II: (As Applicable)
   a. Drill all probe holes for static pressure readings, pitot tube traverse readings and temperature readings.
   b. Check motor electrical current supply and rated running amperage of fan motors.
   c. Check fan and motor speeds.
   d. Check available adjustment tolerance.
3. Phase III: (As Applicable)
   a. Make first complete air distribution run throughout entire system and record first run statistics.
   b. Using pitot tube traverse in all main duct, branch duct downstream of VAV terminal units, supply and return, proportion all air in required amounts to the various main duct runs and branch runs.
   c. Make second complete air distribution run throughout entire system for check on proper proportion of air.

4. Phase IV: (As Applicable)
   a. Using pitot tube traverse, set all main line dampers to deliver proper amount of CFM to all areas.
   b. Using pitot tube traverse, set all branch line damper to deliver proper amount of CFM to diffusers and sidewall supply grilles in each zone.
   c. Read CFM at each outlet and adjust to meet requirements.
   d. Test and record all items to (-5% to +10%).
5. Phase V: (As Applicable)
   a. Test and adjust RPM to design requirements.
   b. Test and record motor full load amperage.
   c. Make pitot tube traverse of main supply ducts and obtain design CFM at fans.
   d. Test and record system static pressures, suction and discharge.
   e. Test and adjust system for design re-circulated air CFM.
   f. Test and adjust system for design CFM outside air.
   g. Adjust all main supply and return air ducts to proper design CEM.
   h. Adjust all zones to proper design CFM supply and return.
   i. Test and adjust each diffuser, grille and register to within (-5% to 10%) of design requirements.
   j. In order to avoid negative pressure zones in conditioned spaces to outside ambient pressure conditions, balancing return air grille flow rates in a space should be based on the supply air flow to the space being balanced <u>less</u> the ratio of the outside air to supply air flow rate on the respective AHU serving the space, times the supply airflow rate of the diffusers in the space.
   k. Each grille, diffuser and register shall be identified with appropriate tag and room location.
   l. Size, type and manufacturer of diffusers, griller registers and all test equipment shall be identified and listed. Manufacturer's ratings on all equipment shall be used for required calculations.
   m. Readings and tests of differs, grilles and registers shall include required FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustments.
   n. In cooperation with the control manufacturer's representative, set adjustments of automatically operated dampers to operate as specified, indicated and/or noted.
   o. All diffusers, grilles and registers shall be adjusted to minimize drafts in all areas.
   p. As a part of the work of this contract, the mechanical contractor shall make any changes in the pulleys, belts and dampers or the addition5 of dampers required for correct balance as recommended by the air balance agency at no additional cost to owner.
6. Phase VI: (As Applicable)
   a. Provide pressure and temperature profile of all air handling units including return air fans, filters, and coils.

D. Test, Adjust and Balance Procedure - Water Distribution System:
   1. Phase I: (As Applicable)

a. Open all valves to full position, including oil stop valves, Close bypass valves and open return line balancing cocks,
b. Examine water in system to determine if it has been treated and is clean.
c. Check pump rotation.
d. Check expansion tanks to make sure they are not air bound and that the system is full of water.
e. Check all air vents at high points of water systems to make sure they are installed properly and are operating freely. Make certain all air is removed from circulating system.
f. Set all temperature controls so that all coils are calling for full cooling. This should close all automatic bypass valves at coil and chillers. To balance hot water coils/ set system to call for full heating.
g. Check operation of automatic bypass valves.
h. Check and set operating temperatures of boilers, heat exchangers, and chillers to design requirements.
i. Complete air balance must have been accomplished before water balance is begun.

2. Phase II: (As Applicable)
   a. Check water temperature at inlet side of cooling and heating coils. Note rise or drop of temperatures from source.
   b. Balance each chilled water coil.
   c. Balance each water flow measuring device off the hot water main at each floor to the total connected load (-5% to +10%).
   d. Balance each hot water end-of-the-run three way value controlled reheat coil to (-5% to +101) (- 10% to 15% of hot coils have 3 way valves).
   e. Upon completion of flow readings and coil adjustments, mark all settings and record all data.
3. Phase III:
   a. Install pressure gauges on each coil, then read pressure drop through coil at set flow rate on call for full cooling.
   b. Check and record the following items at each cooling and heating element.
      1) Inlet water and air temperature.
      2) Leaving water and air temperatures.
      3) Pressure drop of each coil.
      4) All mechanical specifications of pumps.
      5) Rated and actual running amperage of pump motor.

E. Perform all of the air and water system balancing as specified in this section.

END OF SECTION

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SECTION 23 0630
CLEANING MECHANICAL SYSTEMS

PART 1 - GENERAL

1.1 PROVISIONS

A. Requirements of Section 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition. Alternate methods and/or materials may be submitted to the Engineer for consideration in accordance with Section 3.3 of the Instructions to Bidders. Those judged to be equal to that specified, will receive written approval.

1.2 DESCRIPTION

A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.

B. The work described in this section of the specifications includes, but is not limited to, the following:
   1. Cleaning of ducts and apparatus casings.
   2. Cleaning of HVAC systems and piping.
   3. General cleanup.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 DUCTWORK AND ACCESSORIES

A. Thoroughly clean new HVAC ductwork and accessories prior to operation of air moving equipment.

3.2 MECHANICAL SYSTEMS AND PIPING

A. Verify that all indoor and outdoor mechanical systems including, but not limited to, ductwork, piping, equipment, etc. are clean and free of construction debris prior to equipment start-up.

B. Thoroughly clean all new mechanical system and piping surfaces (interior and exterior) from construction dust and debris.

3.3 FACTORY FINISHES

A. Clean items with factory finishes.

B. Touch up bare places, scratches and other minor damage to finishes. Use only factory supplied paint of matching color and formula.

C. If finishes are badly damaged or if there are many damaged, scratched or bare places, refinish the entire item. Engineer will be the judge of whether refinishing is required.

3.4 GENERAL CLEANUP

A. Upon completion of contract and progressively as work proceeds, clean up dirt, debris, oil materials, etc., and remove from site, keeping premises in neat and clean condition to satisfaction of the Engineer.

B. Stoppage, discoloration or other damage to parts of the building, its finish, or furnishings due to failure to properly clean piping systems or duct systems shall be repaired without cost to the Owner.

END OF SECTION

SECTION 23 0700
MECHANICAL INSULATION

PART 1 GENERAL

1.1 PROVISIONS

A. Requirements of Section 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

B. Throughout the specifications, types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of quality and performance and not for the purpose of limiting competition.

1.2 DESCRIPTION

A. Work covered by this Section includes furnishing of and paying for all materials, labor, services, equipment, licenses, taxes, other items, and appliances necessary for the execution, installation and completion of all work specified herein and/or shown on the drawings.

B. The work described in this section of the specifications includes but is not limited to the following:
   1. Thermal resistance "R" values used herein are expressed in units of "Hour/Degrees F/Sq. Ft./Btu per Inch of Thickness" on a flat surface at a mean temperature of 75 degrees F, unless specifically noted.

1.3 RELATED WORK

A. The following items of related work are specified and included in other sections of these specifications:
   1. Section 22 0500 - Common Work for HVAC, Plumbing, and Fire Protection
   2. Section 23 0516 - Piping and Fittings
   3. Section 23 3113 - Sheet Metal Ductwork

1.4 APPLICABLE CODES AND STANDARDS

A. INTERNATIONAL ENERGY CONSERVATION CODE

B. ASTM E-84.

C. NFPA 225.

D. UL 723.

E. NFPA 90A.

1.5 DEFINITIONS

A. "Exposed" equipment, ducts and piping are areas which will be visible without removing ceilings or opening access panels. "Concealed" is not "Exposed".

1.6 SUBMITTALS

A. Submit seven copies of all insulating materials for review by the Engineer.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

A. CertainTeed, Armstrong, Owens-Corning, Manville.

2.2 CERTIFICATION/QUALITY ASSURANCE

A. Only products of manufacturers meeting this specification will be approved.

B. Products shall meet applicable national, model, state and local building codes and be UL (or other recognized testing lab) listed for intended service.

C. All insulation materials shall be delivered and stored in manufacturer's containers and kept free from dirt, water, chemical, and mechanical damage.

D. All insulation, jacket, adhesives, coatings, sealers, tapes, shall have a flame spread rating of 25 or less and smoke development of 50 or less when tested in accordance with ASTM E-84, NFPA 225, UL 723, and further must meet the requirements of NFPA 90-A where applicable and model and local buildings, plumbing, and mechanical codes.

E. All insulation and accessories located outdoors shall be rated for the application.

2.3 MATERIAL FOR PIPE

A. Materials for Pipe and Equipment: Provide factory pre-molded or shop or site mitered segment type insulation for pipe, pipe fittings, and valves. Fitting insulation shall be of same thickness and material as adjoining pipe insulation.

B. All miscellaneous tanks, separators, pumps, supports, exchangers, valves, converters, expansion tanks, etc shall be completely insulated with the appropriate material as specified below according to the respective mechanical/plumbing system.

2.4 DUCTWORK

A. All supply, return and outside air ductwork outside of mechanical rooms shall be externally insulated with 2-1/5 in. thick, 0.75 pounds per cubic foot, blanket flexible mineral fiber insulation conforming to ASTM C 553, Type 1, Class B-3. Provide insulation with factory applied all-purpose jacket with integral vapor barrier. Additionally, the first 15 feet of supply ductwork from each AHU shall be acoustically lined with 1" thick fiberglass duct liner minimum density of 1 ½ pcf. Exhaust duct that is subject to sweating shall also be externally insulated with 2-1/5 in. thick, 0.75 pounds per cubic foot, blanket flexible mineral fiber insulation

conforming to ASTM C 553, Type 1, Class B-3. Provide insulation with factory applied all-purpose jacket with integral vapor barrier. All joints and seams shall be sealed with a UL181 metal tape, minimum 3" wide, approved by the insulation manufacturer. Flame spread/smoke developed rating for all insulation shall not exceed 25/50. Acoustically lined ductwork shall also be externally insulated. The R value refers to the installed thickness and NOT out-of -package. Where rectangular ducts are 20" in width (and length) or greater, duct wrap shall be additionally secured to the all sides of the duct with mechanical fasteners such as pins and speed clip washers, spaced on 18" centers maximum to prevent sagging on insulation. Before applying Duct Wrap, ducts shall be clean, dry and tightly sealed at all joints and seams. Seal all tears and punctures and other penetrations of the duct wrap facing. Owens Corning all service fiber glass duct wrap or approved equal.

B. All supply, return and outside air and exhaust ductwork inside of mechanical rooms shall be externally insulated with 2 in. thick, 6 pounds per cubic foot, rigid board mineral fiber insulation conforming to ASTM C 612, Type IA or Type IB. Provide insulation with factory applied all-purpose foil jacket with integral vapor barrier. Additionally, the first 15 feet of supply ductwork from each AHU shall be acoustically lined with 1" thick fiberglass duct liner minimum density of 1 ½ pcf. Owens Corning Fiberglas 705 Series or approved equal.

C. Grease Duct (Type 1) and condensate duct (Type 2):
   1. Fire-Rated Blanket: 2 layers 1-1/2" thick each High-temperature, flexible, blanket insulation with FSK jacket that is tested and certified to provide a 2-hour fire rating by UL and acceptable to authority having jurisdiction. Product shall be tested per ASTM E-2336. Provide stainless steel banding and install as per strict manufactures recommendations.
   2. Unifrax Corporation; FyreWrap elite 1.5 or approved equal

2.5 AIR DISTRIBUTION DEVICES

A. Grille, register and diffuser housings and/or plenums, exposed to unconditioned air above ceilings, shall be insulated with 2-1/5 in. thick, 0.75 pounds per cubic foot, blanket flexible mineral fiber insulation conforming to ASTM C 553, Type 1, Class B-3. Provide insulation with factory applied all-purpose jacket with integral vapor barrier. Flame spread/smoke developed rating for all insulation shall not exceed 25/50. The R value refers to the installed thickness and not out-of -package. Before applying insulation, devices shall be clean, dry and tightly sealed at all joints and seams. Seal all tears and punctures and other penetrations of the insulation facing. Owens Corning all service fiber glass wrap or prior approved equal.

2.6 DOMESTIC COLD SUPPLY, HOT SUPPLY AND HOT RETURN WATER PIPING AND EQUIPMENT

A. Glass Fiber:
   1. Provide factory-formed, fiberglass pipe insulated factory-jacketed "system" type similar to Owens-Corning 25 ASJ heavy density, one-piece, dual temperature, pre-molded insulation.

2. Insulate all valves, fittings and flanges with 3-pound density fiberglass insulation to a thickness equal to the adjacent piping insulation and covered with pre-molded 25/50 rated PVC fitting, vapor sealed with Childers CP-30 vapor barrier mastic.
3. Jacket to be fiberglass reinforced kraft paper with aluminum foil.
4. Insulation thickness, based on insulation having a conductivity not exceeding 0.27 Btu · inch/(h · ft^2 · °F), shall be as follows:
   a. Domestic cold water piping - 1" thick
   b. Domestic hot water supply and return (90°F through 140°F) - 1" thick
5. Cover all piping, valves, fittings and all miscellaneous devices with .030" thick color coded PVC jacket and pre-molded PVC fittings secured per manufacturer's recommendations.

2.7 HEATING HOT WATER PIPING AND EQUIPMENT

A. Glass Fiber:
   1. Provide factory-formed, fiberglass pipe insulated factory-jacketed "system" type similar to Owens-Corning 25 ASJ heavy density, one-piece, dual temperature, pre-molded insulation.
   2. Insulate all valves, fittings and flanges with 3-pound density fiberglass insulation to a thickness equal to the adjacent piping insulation and covered with pre-molded 25/50 rated PVC fitting, vapor sealed with Childers CP-30 vapor barrier mastic.
   3. Jacket to be fiberglass reinforced kraft paper with aluminum foil.
   4. Insulation thickness, based on insulation having a conductivity range between 0.21 and 0.28 Btu · inch/(h · ft^2 · °F) and an operating temperature range between 105°F and 140°F, shall be as follows:
      a. 1.5" thick for pipe sizes 1-1/2" diameter and larger
      b. 1" thick for pipe sizes 1-1/4" diameter and smaller

B. Cover all piping, valves, fittings and all miscellaneous devices with .030" thick color coded PVC jacket and pre-molded PVC fittings secured per manufacturer's recommendations.

2.8 CHILLED WATER PIPING AND EQUIPMENT

A. Chilled water piping, valves and fittings shall be insulated with cellular glass, ASTM C552, Type II, Class 2. No substitutes will be considered. Insulation shall be a minimum of 1.5 inches thick for piping 2 inches and smaller, 2 inches thick for pipe sizes 2.5 inches to 4 inches, and 3 inches thick for piping 6 inches and larger.

B. Provide a factory-applied, all-purpose jacket. Cover all chilled water piping, valves, fittings and all miscellaneous devices with .030" thick color coded PVC jacket and pre-molded PVC fittings secured per manufacturer's recommendations.

C. Chiller evaporator barrel shall be insulated with cellular glass, ASTM C552, Type II, Class 2. No substitutes will be considered. Insulation shall be a minimum 3 inches thick. Provide a factory-applied, all-purpose jacket. Cover with .030" thick color coded PVC jacket and remolded PVC fittings secured per manufacturer's recommendations.

2.9 CONDENSATE DRAIN

A. Condensate drain piping shall be insulated with flexible cellular insulation, ASTM C 534, Type I, with vapor barrier. Thickness shall be a minimum of ½ inch.

2.10 REFRIGERANT PIPING AND EQUIPMENT

A. Refrigerant piping shall be insulated with flexible cellular insulation, ASTM C 534, Type I, with vapor barrier. Thickness shall be a minimum of 1 inch. Provide aluminum jacketing for all insulated refrigerant piping located outdoors.

B. All liquid and suction lines shall be insulated continuously from a point 6" inside the air handling unit to the suction service valve at the compressor.

C. Piping design must allow for adequate spacing of insulation thickness and cross ventilation around the insulation. Do not crowd the insulation.

2.11 STORM DRAIN

A. All horizontal storm drain piping up to an including the 5 feet vertical shall be externally insulated with 2 in. thick, 0.75 pounds per cubic foot, blanket flexible mineral fiber insulation conforming to ASTM C 553, Type 1, Class B-3.

2.12 DRAIN PIPING COLLECTING COLD CONDENSATE

A. Condensate drain piping shall be insulated with flexible cellular insulation, ASTM C 534, Type I, with vapor barrier. Thickness shall be a minimum of ½" inch.

2.13 COLOR IDENTIFICATION OF PIPE AND FITTINGS

A. All insulated pipe shall utilize 0.030" PVC jacket and fittings shall be pre-molded PVC. The PVC shall utilize the color described below for each utility. If the pipe and fittings are not insulated, the utility shall be painted as per the color described below. Sherwin Williams one coat KEM Prime, and 2 coats Sherwin Williams Dura Plate 235 Industrial or prior approved equal.
   1. 120 degree domestic hot water - light red
   2. 140 degree domestic hot water - purple
   3. Domestic cold water - green
   4. Natural gas - yellow
   5. Fire protection - red
   6. Chilled water - blue
   7. Heating hot water - light red
   8. Fuel oil - light yellow

PART 3 EXECUTION

3.1 GENERAL

A. Insulation shall be applied in a workmanlike manner by experienced, qualified workmen.

B. Insulation shall not be applied until all pressure testing has been completed, inspected and released for insulation applications. (This does not apply to ductwork acoustical liner.)

C. No pipe insulation shall be cut where a hanger is located. If hangers have been installed which violates this strict requirement notify the Engineer immediately.

D. All surfaces shall be clean and dry when covering is applied. Covering to be dry when installed and before and during application of any finish, unless such finish requires specifically a wetted surface for application.

E. All adhesives, cements, and mastics shall be compatible with materials applied and shall not attack materials in either wet or dry state.

F. Install insulation using professional insulators who have a minimum of 5 years of experience in commercial or industrial projects.

G. Exposed-to-view insulation shall have a well tailored appearance.

H. Install refrigeration piping insulation in accordance with ASTM C1710 and manufacturer installation recommendations.

I. Insulation end joints to be tightly butted together and the longitudinal seam stapled closed with outward clinch staples, 3" on center. Before stapling, heavily coat the underside of the jacket overlap with vapor barrier adhesive, Childers CP-30 or equal. Locate all longitudinal seams out of sight. Cover end joints with factory furnished, 4" wide vapor barrier striping tapes, heavily coating the underside and secure with vapor barrier adhesive. Seal all ends of pipe insulation with vapor barrier mastic at valves, fittings, flanges, direct hanger contacts and every butt joint of straight run.

J. Valves, Fittings and Flanges: Insulate all valves, fittings and flanges with 3-pound density, flexible fiberglass insulation to a thickness equal to the adjacent piping insulation and covered with pre-molded 25/50 rated PVC fittings, vapor sealed with Childers CP-30 vapor barrier mastic.

K. Hangers and Rollers: At hangers and rollers where the pipe is supported by the insulation, the Insulation Contractor shall install an insert section of wood cellular glass or calcium silicate on all piping 3" diameter and larger inside the vapor barrier. The length of insert section shall not be less than 12" for all piping through 8" and 18" on pipe size 10" and over. Coat the insert section with vapor barrier mastic to provide an effective vapor seal. Provide a protective shield covering of 18 gauge for piping 6" and smaller and 16 gauge for 8" and larger, galvanized steel placed centrally between the insert section of all hangers and rollers. Shield shall cover half of the insulation and have a length of not less than 12" on pipe sizes up to 8" and 18" on pipe sizes 10" and over.

L. Insulate and weather protect all valves and fittings.

END OF SECTION

SECTION 23 2300
REFRIGERANT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes refrigerant piping used for air-conditioning applications.

B. Refrigerant piping shall be designed and sized per equipment manufacturer. Provide all necessary fittings, valves, solenoids, strainers, accumulators, traps, etc. as directed by the equipment manufacturer.

1.3 PERFORMANCE REQUIREMENTS

A. Line Test Pressure for Refrigerant R-134a:
   1. Suction Lines for Air-Conditioning Applications: 115 psig.
   2. Suction Lines for Heat-Pump Applications: 225 psig.
   3. Hot-Gas and Liquid Lines: 225 psig.

B. Line Test Pressure for Refrigerant R-407C:
   1. Suction Lines for Air-Conditioning Applications: 230 psig.
   2. Suction Lines for Heat-Pump Applications: 380 psig.
   3. Hot-Gas and Liquid Lines: 380 psig.

C. Line Test Pressure for Refrigerant R-410A:
   1. Suction Lines for Air-Conditioning Applications: 300 psig.
   2. Suction Lines for Heat-Pump Applications: 535 psig.
   3. Hot-Gas and Liquid Lines: 535 psig

1.4 SUBMITTALS

A. Product Data: For each type of valve and refrigerant piping specialty indicated. Include pressure drop, based on manufacturer's test data, for the following:
   1. Thermostatic expansion valves.
   2. Solenoid valves.
   3. Hot-gas bypass valves.
   4. Filter dryers.
   5. Strainers.
   6. Pressure-regulating valves.

B. Shop Drawings: Show layout of refrigerant piping and specialties, including pipe, tube, and fitting sizes, flow capacities, valve arrangements and locations, slopes of

horizontal runs, oil traps, double risers, wall and floor penetrations, and equipment connection details. Show interface and spatial relationships between piping and equipment.

1. Shop Drawing Scale: **1/4 inch equals 1 foot.**
2. Refrigerant piping indicated on Drawings is schematic only. Size piping and design actual piping layout, including oil traps, double risers, specialties, and pipe and tube sizes to accommodate, as a minimum, equipment provided, elevation difference between compressor and evaporator, and length of piping to ensure proper operation and compliance with warranties of connected equipment.
3. Refer to section division 23 for shop drawings for complete specification

C. Field quality-control test reports.

D. Operation and Maintenance Data: For refrigerant valves and piping specialties to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."

B. Comply with ASHRAE 15, "Safety Code for Refrigeration Systems."

C. Comply with ASME B31.5, "Refrigeration Piping and Heat Transfer Components."

1.6 PRODUCT STORAGE AND HANDLING

A. Store piping in a clean and protected area with end caps in place to ensure that piping interior and exterior are clean when installed.

1.7 COORDINATION

A. Coordinate size and location of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 7 Section "Roof Accessories."

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Copper Tube: ASTM B 280, Type ACR.

B. Wrought-Copper Fittings: ASME B16.22.

C. Wrought-Copper Unions: ASME B16.22.

D. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.

E. Brazing Filler Metals: AWS A5.8.

2.2 VALVES AND SPECIALTIES

A. Diaphragm Packless Valves:
   1. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.
   2. Diaphragm: Phosphor bronze and stainless steel with stainless-steel spring.
   3. Operator: Rising stem and hand wheel.
   4. Seat: Nylon.
   5. End Connections: Socket, union, or flanged.
   6. Working Pressure Rating: 500 psig .
   7. Maximum Operating Temperature: 275 deg F.

B. Packed-Angle Valves:
   1. Body and Bonnet: Forged brass or cast bronze.
   2. Packing: Molded stem, back seating, and replaceable under pressure.
   3. Operator: Rising stem.
   4. Seat: Nonrotating, self-aligning polytetrafluoroethylene.
   5. Seal Cap: Forged-brass or valox hex cap.
   6. End Connections: Socket, union, threaded, or flanged.
   7. Working Pressure Rating: 500 psig.
   8. Maximum Operating Temperature: 275 deg F.

C. Check Valves:
   1. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
   2. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
   3. Piston: Removable polytetrafluoroethylene seat.
   4. Closing Spring: Stainless steel.
   5. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
   6. End Connections: Socket, union, threaded, or flanged.
   7. Maximum Opening Pressure: 0.50 psig .
   8. Working Pressure Rating: 500 psig .
   9. Maximum Operating Temperature: 275 deg F.

D. Service Valves:
   1. Body: Forged brass with brass cap including key end to remove core.
   2. Core: Removable ball-type check valve with stainless-steel spring.
   3. Seat: Polytetrafluoroethylene.
   4. End Connections: Copper spring.
   5. Working Pressure Rating: 500 psig.

E. Solenoid Valves: Comply with ARI 760 and UL 429; listed and labeled by an NRTL.
   1. Body and Bonnet: Plated steel.
   2. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
   3. Seat: Polytetrafluoroethylene.
   4. End Connections: Threaded.
   5. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter, and ac coil.
   6. Working Pressure Rating: 400 psig.
   7. Maximum Operating Temperature: 240 deg F.

8. Manual operator.

F. Safety Relief Valves: Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
   1. Body and Bonnet: Ductile iron and steel, with neoprene O-ring seal.
   2. Piston, Closing Spring, and Seat Insert: Stainless steel.
   3. Seat Disc: Polytetrafluoroethylene.
   4. End Connections: Threaded.
   5. Working Pressure Rating: 400 psig.
   6. Maximum Operating Temperature: 240 deg F .

G. Thermostatic Expansion Valves: Comply with ARI 750.
   1. Body, Bonnet, and Seal Cap: Forged brass or steel.
   2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
   3. Packing and Gaskets: Non-asbestos.
   4. Capillary and Bulb: Copper tubing filled with refrigerant charge.
   5. Suction Temperature:
   6. Superheat: Adjustable.
   7. Reverse-flow option (for heat-pump applications).
   8. End Connections: Socket, flare, or threaded union.
   9. Working Pressure Rating: 700 psig .

H. Hot-Gas Bypass Valves: Comply with UL 429; listed and labeled by an NRTL.
   1. Body, Bonnet, and Seal Cap: Ductile iron or steel.
   2. Diaphragm, Piston, Closing Spring, and Seat Insert: Stainless steel.
   3. Packing and Gaskets: Non-asbestos.
   4. Solenoid Tube, Plunger, Closing Spring, and Seat Orifice: Stainless steel.
   5. Seat: Polytetrafluoroethylene.
   6. Equalizer External.
   7. Electrical: Molded, watertight coil in NEMA 250 enclosure of type required by location with 1/2-inch conduit adapter, and ac coil.
   8. End Connections: Socket.
   9. Throttling Range: Maximum 5 psig .
   10. Working Pressure Rating: 500 psig .
   11. Maximum Operating Temperature: 240 deg F.

I. Straight-Type Strainers:
   1. Body: Welded steel with corrosion-resistant coating.
   2. Screen: 100-mesh stainless steel.
   3. End Connections: Socket or flare.
   4. Working Pressure Rating: 500 psig.
   5. Maximum Operating Temperature: 275 deg F.

J. Angle-Type Strainers:
   1. Body: Forged brass or cast bronze.
   2. Drain Plug: Brass hex plug.
   3. Screen: 100-mesh monel.
   4. End Connections: Socket or flare.

5. Working Pressure Rating: 500 psig.
6. Maximum Operating Temperature: 275 deg F.

K. Moisture/Liquid Indicators:
1. Body: Forged brass.
2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
3. Indicator: Color coded to show moisture content in ppm.
4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.
5. End Connections: Socket or flare.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 240 deg F.

L. Replaceable-Core Filter Dryers: Comply with ARI 730.
1. Body and Cover: Painted-steel shell with ductile-iron cover, stainless-steel screws, and neoprene gaskets.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Desiccant Media: Activated alumina.
4. Designed for reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: **[**2 psig**]**.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 240 deg F.

M. Permanent Filter Dryers: Comply with ARI 730.
1. Body and Cover: Painted-steel shell.
2. Filter Media: 10 micron, pleated with integral end rings; stainless-steel support.
3. Desiccant Media: Activated **[alumina] [charcoal]**.
4. Designed for reverse flow (for heat-pump applications).
5. End Connections: Socket.
6. Access Ports: NPS 1/4 connections at entering and leaving sides for pressure differential measurement.
7. Maximum Pressure Loss: **[2 psig]**.
8. Working Pressure Rating: 500 psig.
9. Maximum Operating Temperature: 240 deg F.

N. Mufflers:
1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or flare.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg F.

O. Receivers: Comply with ARI 495.

1. Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.
2. Comply with UL 207; listed and labeled by an NRTL.
3. Body: Welded steel with corrosion-resistant coating.
4. Tappings: Inlet, outlet, liquid level indicator, and safety relief valve.
5. End Connections: Socket or threaded.
6. Working Pressure Rating: 500 psig.
7. Maximum Operating Temperature: 275 deg F.

P. Liquid Accumulators: Comply with ARI 495.
1. Body: Welded steel with corrosion-resistant coating.
2. End Connections: Socket or threaded.
3. Working Pressure Rating: 500 psig.
4. Maximum Operating Temperature: 275 deg F.

2.3 REFRIGERANTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Atofina Chemicals, Inc.
2. DuPont Company; Fluorochemicals Div.
3. Honeywell, Inc.; Genetron Refrigerants.
4. INEOS Fluor Americas LLC.

B. ASHRAE 34, R-134a: Tetrafluoroethane.

C. ASHRAE 34,R-407C:Difluoromethane/Pentafluoroethane/1,1,1,2-Tetrafluoroethane.

D. ASHRAE 34, R-410A: Pentafluoroethane/Difluoromethane.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS FOR REFRIGERANT R-134A, R-407C, R-410A

A. Suction Lines, Hot-Gas and Liquid Lines NPS 4 and Smaller: Copper, Type ACR, drawn-temper tubing and wrought-copper fittings with brazed joints.

B. Safety-Relief-Valve Discharge Piping:
1. Copper, Type ACR, annealed- or drawn-temper tubing and wrought-copper fittings with brazed joints.

3.2 VALVE AND SPECIALTY APPLICATIONS

A. Install diaphragm packless valves in suction and discharge lines of compressor.

B. Install service valves for gage taps at inlet and outlet of hot-gas bypass valves and strainers if they are not an integral part of valves and strainers.

C. Install a check valve at the compressor discharge and a liquid accumulator at the compressor suction connection.

D. Except as otherwise indicated, install diaphragm packless valves on inlet and outlet side of filter dryers.

E. Install a full-sized, three-valve bypass around filter dryers.

F. Install solenoid valves upstream from each expansion valve and hot-gas bypass valve. Install solenoid valves in horizontal lines with coil at top.

G. Install thermostatic expansion valves as close as possible to distributors on evaporators.
   1. Install valve so diaphragm case is warmer than bulb.
   2. Secure bulb to clean, straight, horizontal section of suction line using two bulb straps. Do not mount bulb in a trap or at bottom of the line.
   3. If external equalizer lines are required, make connection where it will reflect suction-line pressure at bulb location.

H. Install safety relief valves where required by ASME Boiler and Pressure Vessel Code. Pipe safety-relief-valve discharge line to outside according to ASHRAE 15.

I. Install moisture/liquid indicators in liquid line at the inlet of the thermostatic expansion valve or at the inlet of the evaporator coil capillary tube.

J. Install strainers upstream from and adjacent to the following unless they are furnished as an integral assembly for device being protected:
   1. Solenoid valves.
   2. Thermostatic expansion valves.
   3. Hot-gas bypass valves.
   4. Compressor.

K. Install filter dryers in liquid line between compressor and thermostatic expansion valve, and in the suction line at the compressor.

L. Install receivers sized to accommodate pump-down charge.

M. Install flexible connectors at compressors.

3.3 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as per equipment manufacturer sizing and recommendations Drawings. Submit calculations for review.

B. Install refrigerant piping according to ASHRAE 15.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping adjacent to machines to allow service and maintenance.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Select system components with pressure rating equal to or greater than system operating pressure.

J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.

K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels if valves or equipment requiring maintenance is concealed behind finished surfaces.

L. Install refrigerant piping in protective conduit where installed belowground.

M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.

N. Slope refrigerant piping as follows:
   1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.
   2. Install horizontal suction lines with a uniform slope downward to compressor.
   3. Install traps and double risers to entrain oil in vertical runs.
   4. Liquid lines may be installed level.

O. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

P. Install pipe sleeves at penetrations in exterior walls and floor assemblies.

Q. Seal penetrations through fire and smoke barriers.

R. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.

S. Install sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation.

T. Seal pipe penetrations through exterior walls.

U. Identify refrigerant piping and valves according to Division 23 Section "Mechanical Identification."

3.4 PIPE JOINT CONSTRUCTION

A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.

D. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."

E. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.

F. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.

G. Welded Joints: Construct joints according to AWS D10.12/D10.12M.

3.5 HANGERS AND SUPPORTS

A. Hanger, support, and anchor products are specified in Division 15 Section "Hangers and Supports."

B. Install the following pipe attachments:
   1. Adjustable steel clevis hangers for individual horizontal runs less than 10 feet long.
   2. Spring hangers to support vertical runs.
   3. Copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.

C. Install hangers for copper tubing with the following maximum spacing and minimum rod sizes:
   1. NPS 1/2: Maximum span, 60 inches; minimum rod size, 1/4 inch.
   2. NPS 5/8: Maximum span, 60 inches; minimum rod size, 1/4 inch .
   3. NPS 1: Maximum span, 72 inches; minimum rod size, 1/4 inch .
   4. NPS 1-1/4: Maximum span, 96 inches; minimum rod size, 3/8 inch.
   5. NPS 1-1/2: Maximum span, 96 inches; minimum rod size, 3/8 inch.
   6. NPS 2: Maximum span, 96 inches; minimum rod size, 3/8 inch.
   7. NPS 2-1/2: Maximum span, 108 inches; minimum rod size, 3/8 inch.
   8. NPS 3: Maximum span, 10 feet; minimum rod size, 3/8 inch.
   9. NPS 4: Maximum span, 12 feet; minimum rod size, 1/2 inch.

D. Support multifloor vertical runs at least at each floor.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:
   1. Comply with ASME B31.5, Chapter VI.
   2. Test refrigerant piping, specialties, and receivers. Isolate compressor, condenser, evaporator, and safety devices from test pressure if they are not rated above the test pressure.
   3. Test high- and low-pressure side piping of each system separately at not less than the pressures indicated in Part 1 "Performance Requirements" Article.
      a. Fill system with nitrogen to the required test pressure.
      b. System shall maintain test pressure at the manifold gage throughout duration of test.
      c. Test joints and fittings with electronic leak detector or by brushing a small amount of soap and glycerin solution over joints.
   4. Remake leaking joints using new materials, and retest until satisfactory results are achieved.

3.7 REFRIGERANT PIPE TESTING

A. Refrigerant Leakage Test: After all components of the refrigerant system have been installed and the piping connected, the system shall be subjected to a refrigerant leakage test. The refrigerant leakage test shall be done with dry nitrogen before any refrigerant pipe is insulated or covered. High and low side of the refrigerant system shall be tested for the minimum refrigerant leakage test pressure specified in ASHRAE 15, for the refrigerant employed in the system. System shall be provided tight and free of leaks by allowing the refrigerant leakage test pressure to remain on the system for 24 hours with no drop in pressure. The initial test pressure and surrounding air temperature will be recorded. After the 24 hour hold period, the final system pressure and surrounding air temperature will be recorded. A correction of 0.3 psi shall be allowed for each degree F change in the initial and final temperature of the surrounding air, plus for an increase and minus for a decrease. The system shall have passed the refrigerant leakage test if the corrected final system pressure is equal to the initial system test pressure. If the pressures are not equal, the leaks shall be located and repaired.

B. Refrigerant Leaks: To repair leaks, the joint shall be taken apart, thoroughly cleaned, and remade as a new joint. Joints repaired by caulking or remelting and adding more brazing material will not be acceptable. After leak repairs have been made, the refrigerant leakage test shall be conducted again.

C. Evacuation Test: After the foregoing tests have been satisfactorily completed and the pressure relieved, entire system shall be evacuated to an absolute pressure of 300 microns. During evacuation of the system, the ambient temperature shall be higher than 35 degrees F. Vacuum line shall be closed, and the system shall stand for 1 hour. After this period, the absolute pressure shall not exceed 500 microns. If the pressure rises over 500 microns, the system shall continue to be evacuated

until the system reaches 300 microns and can stand for 1 hour with the vacuum line closed without the absolute pressure rising over 500 microns. During evacuation, pressures shall be recorded by a thermocouple type, electronic type, or a calibrated-micron type gauge.

3.8 SYSTEM PERFORMANCE TESTS

A. After the foregoing tests have been completed and before each refrigeration system is accepted, tests to demonstrate the general operating characteristics of all equipment shall be conducted by an approved manufacturer's startup representative experienced in system startup and testing. Tests demonstrate that the entire system is functioning in accordance with the drawings and specifications. Corrections and adjustments shall be made as necessary and tests shall be re-conducted to demonstrate that the entire system is functioning as specified.

3.9 SYSTEM CHARGING

A. Charge system using the following procedures:
   1. Install core in filter dryers after leak test but before evacuation.
   2. Evacuate entire refrigerant system with a vacuum pump to 500 micrometers. If vacuum holds for 12 hours, system is ready for charging.
   3. Break vacuum with refrigerant gas, allowing pressure to build up to 2 psig.
   4. Charge system with a new filter-dryer core in charging line.

3.10 ADJUSTING

A. Adjust thermostatic expansion valve to obtain proper evaporator superheat.

B. Adjust high- and low-pressure switch settings to avoid short cycling in response to fluctuating suction pressure.

C. Adjust set-point temperature of air-conditioning or chilled-water controllers to the system design temperature.

D. Perform the following adjustments before operating the refrigeration system, according to manufacturer's written instructions:
   1. Open shutoff valves in condenser water circuit.
   2. Verify that compressor oil level is correct.
   3. Open compressor suction and discharge valves.
   4. Open refrigerant valves except bypass valves that are used for other purposes.
   5. Check open compressor-motor alignment and verify lubrication for motors and bearings.

E. Replace core of replaceable filter dryer after system has been adjusted and after design flow rates and pressures are established.

END OF SECTION

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SECTION 23 8130
VARIABLE REFRIGERANT VOLUME SPLIT-SYSTEM AIR-CONDITIONERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Requirements of Division 01 including, but not limited to, General Requirements, Submittal Procedures, Quality Requirements, Product Requirements, Substitution Procedures, Operation and Maintenance Data, Demonstration and Training shall apply to all work under this section.

1.2 SUBMITTALS

A. Product Data: For each type of unit indicated. Include the following:
   1. Certified fan-performance curves with system operating conditions indicated.
   2. Certified fan-sound power ratings.
   3. Certified coil-performance ratings with system operating conditions indicated.
   4. Motor ratings, electrical characteristics, and motor and fan accessories.
   5. Unit construction materials and finishes.
   6. Filters with performance characteristics.

B. Shop Drawings:
   1. System layout including unit location, supports, refrigerant pipe routing/sizing, etc.
   2. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
   3. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.
   4. Wiring Diagrams: Power, signal, and control wiring.

C. Coordination Drawings: Submit with Shop Drawings. Show mechanical-room layout and relationships between components and adjacent structural and mechanical elements. Show support locations, type of support, and weight on each support. Indicate and certify field measurements.
   1. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   2. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
   3. Manufacturer recommended sizing and routing of refrigerant lines including all refrigerant piping accessories necessary for a fully functional system.

1.3 QUALITY ASSURANCE

A. Source Limitations: Obtain units through one source from a single manufacturer.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of air-handling units and are based on the specific system indicated.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. NFPA Compliance: Units and components shall be designed, fabricated, and installed in compliance with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems."

E. Comply with NFPA 70.

F. Units shall be ETL listed in compliance with UL/ANSI Standard 1995.

G. All unit coils shall meet or exceed the scheduled cooling and heating capacity, selected and rated in accordance with ARI 410.

H. All wiring shall be in accordance with the National Electric Code (NEC).

I. The system will be produced in an ISO 9001 and ISO 14001 facility, which are standards set by the International Standard Organization (ISO). The system shall be factory tested for safety and function.

J. Mechanical equipment for wind-born debris regions shall be designed in accordance with ASCE 7-2002 and installed to resist the wind pressures on the equipment and the supports.

K. The condensing unit(s) shall be factory charged with R-410A.

1.4 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

C. Coordinate size and location of structural-steel support members.

1.5 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Filters: Two sets for each indoor air-handling unit.

1.6 DELIVERY, STORAGE AND HANDLING

A. Unit shall be stored and handled according to the manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers

offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Daikin AC
2. Mitsubishi
3. LG
4. Or prior approved equivalent.

2.2 SYSTEM DESCRIPTION

A. The variable capacity, heat pump air conditioning system shall consist of multiple evaporators, joints and headers, and two-pipe refrigeration distribution system using PID control and variable refrigerant volume condenser unit(s). The condenser shall be a direct expansion (DX), air-cooled heat pump, multi-zone air-conditioning system with variable speed inverter driven compressors using R-410A refrigerant. The condensing unit(s) may connect an indoor evaporator capacity up to 200% of the condensing unit capacity. All zones are each capable of operating separately with individual temperature control.

B. The condensing unit shall be interconnected to indoor unit(s) and shall meet the capacities in accordance with contract drawings. The indoor units shall be connected to the condensing unit utilizing piping joints and headers to ensure correct refrigerant flow and balancing. T style joints are not acceptable.

C. Operation of the system shall permit either cooling or heating of all of the indoor units. Each indoor unit or group of indoor units shall be able to provide set temperature independently via a local remote controller, an Intelligent Controller, an Intelligent Manager or a BMS interface.

D. Systems shall be capable of up to 540ft (640ft equivalent) of linear piping between the condensing unit and furthest located indoor unit.

E. Systems shall be capable of up to 3,280ft total "one-way" piping in the piping network.

F. Systems shall have a vertical (height) separation of up to 295ft between the condensing unit and the indoor units.

G. Each system shall be capable of integrating with open protocol BACnet and/or LonWorks building management systems.

2.3 OPERATING RANGE

A. The operating range in cooling will be 23°F DB ~ 122°F DB.

B. The operating range in heating will be 0°F DB - 77°F DB / -4°F WB - 60°F WB.

C. Cooling mode indoor room temperature range will be 57°F-77°F WB.

D. Heating mode indoor room temperature range will be 59°F-80°F DB.

2.4 CONDENSING UNIT

A. The condensing unit shall be factory assembled and pre-wired with all necessary electronic and refrigerant controls. The refrigeration circuit of the condensing unit shall consist of scroll compressors, motors, fans, condenser coil, electronic expansion valves, solenoid valves, 4-way valve, distribution headers, capillaries, filters, shut off valves, oil separators, service ports and refrigerant regulator.

B. Liquid and suction lines must be individually insulated between the condensing and indoor units.

C. The condensing unit can be wired and piped with access from the left, right, rear or bottom.

D. The connection ratio of indoor units to condensing unit shall be permitted up to 200%.

E. The sound pressure level standard shall be as listed in the manufacturers' engineering manual for the scheduled models at 3 feet from the front of the unit. The condensing unit shall be capable of operating automatically at further reduced noise during night time.

F. The system will automatically restart operation after a power failure and will not cause any settings to be lost, thus eliminating the need for reprogramming.

G. The unit shall incorporate an auto-charging feature.

H. The condensing unit shall be modular in design and should allow for side-by-side installation with minimum spacing.

I. The following safety devices shall be included on the condensing unit; high pressure sensor and switch, low pressure sensor, control circuit fuses, crankcase heaters, fusible plug, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter and anti-recycling timers.

J. To ensure the liquid refrigerant does not flash when supplying to the various indoor units, the circuit shall be provided with a sub-cooling feature.

K. Oil recovery cycle shall be automatic occurring 2 hours after start of operation and then every 8 hours of operation. Each system shall maintain continuous heating during oil return operation. Reverse cycle (cooling mode) oil return during heating operation shall not be permitted due to the potential reduction in space temperature.

L. The condensing unit shall be capable of heating operation at 0°F dry bulb ambient temperature without additional low ambient controls or an auxiliary heat source.

M. The system shall continue to provide heat to the indoor units while in the defrost mode.

2.5 UNIT CABINET

A. The condensing unit shall be completely weatherproof and corrosion resistant. The unit shall be constructed from rust-proofed mild steel panels coated with a baked enamel finish.

2.6 FAN

A. The condensing unit shall consist of one or more propeller type, direct-drive fan motors that have multiple speed operation via a DC (digitally commutating) inverter.

B. The condensing unit fan motor shall have multiple speed operation of the DC (digitally commutating) inverter type, and be of high external static pressure and shall be factory set as standard at 0.12 in. WG. A field setting switch to a maximum 0.32 in. WG pressure is available to accommodate field applied duct for indoor mounting of condensing units.

C. The fan shall be a vertical discharge configuration with a nominal airflow maximum range of 6,530 CFM to 14,120 CFM dependant on model specified.

D. Nominal sound pressure levels shall be as shown below:

Sound Pressure Level dB(A)
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E. The fan motor shall have inherent protection and permanently lubricated bearings and be mounted.

F. The fan motor shall be provided with a fan guard to prevent contact with moving parts.

G. Night setback control of the fan motor for low noise operation by way of automatically limiting the maximum speed shall be a standard feature. Operation sound level shall be selectable from 3 steps as shown below.

Operation Sound (dB)	Night Mode Sound Pressure Level (dB)
Step 1 max.	55
Step 2 max.	50
Step 3 max.	45

2.7 CONDENSER COIL

A. The condenser coil shall be manufactured from copper tubes expanded into aluminum fins to form a mechanical bond.

B. The heat exchanger coil shall be of a waffle louver fin and rifled bore tube design to ensure high efficiency performance.

C. The heat exchanger on the condensing units shall be manufactured from Hi-X seamless copper tube with N-shape internal grooves mechanically bonded on to aluminum fins to an e-Pass Design.

D. The fins are to be covered with an anti-corrosion acrylic resin and hydrophilic film type E1.

E. The pipe plates shall be treated with powdered polyester resin for corrosion prevention. The thickness of the coating must be between 2.0 to 3.0 microns.

2.8 COMPRESSOR

A. The inverter scroll compressors shall be variable speed (PVM inverter) controlled which is capable of changing the speed to follow the variations in total cooling and heating load as determined by the suction gas pressure as measured in the condensing unit. In addition, samplings of evaporator and condenser temperatures shall be made so that the high/low pressures detected are read every 20 seconds and calculated. With each reading, the compressor capacity (INV frequency or STD ON/OFF) shall be controlled to eliminate deviation from target value.

B. The inverter driven compressor in each condensing unit shall be of highly efficient reluctance DC (digitally commutating), hermetically sealed scroll "G2-type" with a maximum speed of 7,980 rpm.

C. Neodymium magnets shall be adopted in the rotor construction to yield a higher torque and efficiency in the compressor instead of the normal ferrite magnet type. At complete stop of the compressor, the neodymium magnets will position the rotor into the optimum position for a low torque start.

D. The capacity control range shall be as low as 6% to 100%.

E. Each non-inverter compressor shall also be of the hermetically sealed scroll type.

F. Each compressor shall be equipped with a crankcase heater, high pressure safety switch, and internal thermal overload protector.

G. Oil separators shall be standard with the equipment together with an intelligent oil management system.

H. The compressor shall be spring mounted to avoid the transmission of vibration.

I. Units sized 6-9 tons shall contain a minimum of 2 compressors, 12-20 ton units shall contain a minimum of 4 compressors. In the event of compressor failure the remaining compressors shall continue to operate and provide heating or cooling at a proportionally reduced capacity. The microprocessor and associated controls shall be designed to specifically address this condition.

J. In the case of multiple condenser modules, conjoined operation hours of the compressors shall be balanced by means of the Duty Cycling Function, ensuring sequential starting of each module at each start/stop cycle, completion of oil return, completion of defrost or every 8 hours.

2.9 ELECTRICAL

A. Refer to equipment schedule for electrical requirements.

B. The control voltage between the indoor and condensing unit shall be 16VDC non-shielded, stranded 2 conductor cable.

C. The control wiring shall be a two-wire multiplex transmission system, making it possible to connect multiple indoor units to one condensing unit with one 2-cable wire, thus simplifying the wiring installation.

D. The control wiring lengths shall be as manufacturers' recommendations.

2.10 CEILING DUCTED UNIT (Med. Static)

A. General: Indoor unit shall be a built-in ceiling concealed fan coil unit, operable with refrigerant R-410A, equipped with an electronic expansion valve, for installation into the ceiling cavity. It is constructed of a galvanized steel casing. It shall be available in capacities from 72,000 Btu/h to 96,000 Btu/h. It shall be a horizontal discharge air with horizontal return air configuration. All models feature a low height cabinet making them applicable to ceiling pockets that tend to be shallow. Computerized PID control shall be used to control superheat to deliver a comfortable room temperature condition. The unit shall be equipped with a programmed drying mechanism that dehumidifies while limiting changes in room temperature. The indoor units sound pressure shall be 48 dB(A) at low speed measured 5 feet below the ducted unit.

2.11 INDOOR UNIT

A. The indoor unit shall be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch. The unit shall have an adjustable external static pressure switch.

B. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.

C. Both refrigerant lines shall be insulated from the outdoor unit.

D. The indoor units shall be equipped with a return air thermistor.

2.12 UNIT CABINET

A. The cabinet shall be located into the ceiling and ducted to the supply and return openings.

B. The cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation.

2.13 FAN

A. The fan shall be direct-drive Sirocco type fan, statically and dynamically balanced impeller with high and low fan speeds available.

B. The airflow rate shall be available in high and low settings.

C. The fan motor shall be thermally protected.

D. The fan motor shall be equipped as standard with adjustable external static pressure (ESP) settings.

2.14 COIL

A. Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond.

B. The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance.

C. The coil shall be a 3 row cross fin copper evaporator coil with 13 fpi design completely factory tested.

D. The refrigerant connections shall be flare connections and the condensate will be 1-5/16 inch outside diameter PVC.

E. A thermistor will be located on the liquid and gas line.

2.15 ELECTRICAL

A. Refer to equipment schedule for electrical requirements.

B. Transmission (control) wiring between the indoor and outdoor unit shall be a maximum of 3,280 feet (total 6,560 feet).

C. Transmission (control) wiring between the indoor unit and remote controller shall be a maximum distance of 1,640 feet.

2.16 CONTROL

A. Provide central management system for scheduling, temperature set-points, mode, fan speed, space temperature limits, and remote controller restrictions.

B. Provide web/email remote system access through an intranet or internet connected browser interface. Provide email functionality for remote notification of system alarms to facility administrator and engineering staff.

2.17 WIRED WALL MOUNT CONTROLLER

A. Features:
1. Up to 16 indoor units are controllable in one group
2. Backlit LCD display in English
3. Display of room temperature and set-point temperatures simultaneously
4. Independent cool/heat set-points with set-point range limits
5. Unoccupied mode with independent cool/heat setback set-points

6. Auto-changeover mode
7. Built in 7-day scheduling
8. Temperature sensor built in to the controller
9. 48 hour clock/calendar backup
10. Airflow direction control

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine roughing-in of steam, hydronic, and condensate drainage piping systems and electrical services to verify actual locations of connections before installation.

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

3.2 INSTALLATION

A. Install air-handling units with the following vibration control devices. Vibration control devices are specified in Section 23 05 48 - Vibration Isolation.

B. Units with Internally Isolated Fans: Secure units to anchor bolts installed in concrete bases.

C. Floor-Mounted Units: Support on concrete bases using neoprene pads. Secure units to anchor bolts installed in concrete bases.

D. Suspended Units: Suspend units from structural-steel support frame using threaded steel rods and spring hangers.

E. Arrange installation of units to provide access space around air-handling units for service and maintenance.

3.3 CONNECTIONS

A. Install piping adjacent to machine to allow service and maintenance.

B. Connect piping to indoor air-handling units mounted on vibration isolators with flexible connectors.

C. Connect condensate drain pans using Type L copper tubing. Extend to nearest equipment or floor drain. Construct deep trap at connection to drain pan and install cleanouts at changes in direction.

D. Electrical: Comply with applicable requirements in Section 26 for power wiring, switches, and motor controls.

E. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.
   1. Leak Test: After installation, fill water and steam coils with water and test coils and connections for leaks. Repair leaks and retest until no leaks exist.
   2. Charge refrigerant coils with refrigerant and test for leaks. Repair leaks and retest until no leaks exist.
   3. Fan Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new units, and retest.
   4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.5 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

B. Final Checks before Startup: Perform the following:
   1. Verify that shipping, blocking, and bracing are removed.
   2. Verify that unit is secure on mountings and supporting devices and that connections to piping, ducts, and electrical systems are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
   3. Perform cleaning and adjusting specified in this Section.
   4. Install clean filters

C. Refer to Section 23 05 93 - HVAC Testing, Adjusting and Balancing Requirements.

D. The system must be installed by a factory trained Contractor. The bidders shall be required to submit training certification proof with bid documents. The mechanical Contractor's installation price shall be based on the systems installation requirements. The mechanical Contractor bids with complete knowledge of the HVAC system requirements. Untrained Contractors who wish to bid this project shall obtain training from the equipment manufacturer or manufacturers' representative prior to bid day.

3.6 CLEANING

A. Clean indoor air-handling units internally, on completion of installation, according to manufacturer's written instructions. Clean fan interiors to remove foreign material and construction dirt and dust. Vacuum clean fan wheels, cabinets, and coils entering air face.

B. After completing system installation and testing, adjusting, and balancing indoor air-handling and air-distribution systems, clean filter housings and install new filters.

PART 4 - PRIOR APPROVED EQUIPMENT (GENERAL INFORMATION)

A. Provide a complete equipment data package for review and prior approval by the

Architect. This package shall include, but is not limited to, equipment capacities at the design condition, power requirements, indoor units CFM/static pressures, fan curves, installation requirements, physical dimensions, and weights. Nominal performance data is not acceptable.

B. Request and receive the equipment data package 15 days prior to bid date and submit this package with the alternate bid.

C. List the equipment supplier and submit the required data package with the bid detailing a complete comparison of the proposed alternate equipment to the specified equipment and the associated cost reduction of the alternate equipment. The Contractor bids an alternate manufacturer with full knowledge that that manufactures product may not be acceptable or approved.

D. Provide a complete drawing package to the Architect 15 days prior to bid day for bidding and installation. The drawing format shall be AutoCad 2007 or later version, on 30"x42" bond sheets. The HVAC and electrical series design documents will be made available in electronic format for use by the equipment supplier in preparing their drawings. The alternate equipment supplier shall prepare the following drawings:
   1. HVAC Floor Plan
   2. HVAC Refrigerant Piping Plan
   3. HVAC Refrigerant Piping/Controls Details
   4. HVAC Details
   5. HVAC Schedules

E. The alternate equipment supplier shall draft all piping circuits, components, overall building control schematic, detailed control wiring diagrams, system details and schedules for their system. The drawings shall convey all requirements to successfully install the alternate equipment suppliers system.

F. Provide (2) drawing package sets plotted on 20 lb. bond paper. Provide (1) drawing package in electronic format on CD.

G. The submitted documents shall be complete system designs and show no less information than required by the contract bid documents.

H. The equipment supplier shall submit as part of the equipment data package condensing unit data sheets. Data sheets to include the following:
   1. Capacities at project design conditions: Cooling
      a. Cooling (Btu/h)
      b. Cooling Input Power(kW)
      c. Full Load EER
   2. Capacities at project design conditions: Heating
      a. Heating (Btu/h)
      b. Heating Input Power(kW)
      c. Full Load COP

I. The submitted capacity and efficiency performance must meet or exceed the listed performance on the schedule at the designed space conditions including de-rate factors for defrost if applicable and refrigerant piping losses.

J. Operating Temperature Range:
   1. Cooling
   2. Heating

K. Power Supply:
   1. Maximum Circuit Amps (MCA)
   2. Maximum Overcurrent Protection Amps (MOP)
   3. Maximum Starting Current (MSC)
   4. Condenser Fan Motor

L. Refrigerant:
   1. Refrigerant Type
   2. Refrigerant Charge
   3. Control

M. Unit Data:
   1. Max. Number of Indoor Units
   2. Sound Pressure Level at 3ft. (dBA)
   3. Weight (lbs)
   4. Dimensions

N. The equipment supplier shall guarantee the performance of their system and all published data submitted. Performance shall be based on the design criteria below:

   1. Room Temperature (Cooling): _____
   2. Room Temperature (Heating): _____
   3. Ambient Temperature (Summer): _____
   4. Ambient Temperature (Winter): _____
   5. Defrost De-rate Factor: _____
   6. Refrigerant Piping Loss: _____

O. The alternate equipment supplier shall submit with bid, indoor unit data sheets. Data sheets to include the following:
   1. Capacities at project design conditions:
      a. Cooling (Btu/h)
      b. Heating (Btu/h)
      c. Air Flow (CFM)
      d. Full Load EER10
      e. Full Load COP
      f. External Static Pressure (ESP)
      g. Electrical Data (MCA, MOP, MSC, RLA)
      h. Weight (lbs)
      i. Dimensions

END OF SECTION

DIVISION 26

ELECTRICAL

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SECTION 26 0500
COMMON WORK FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section is an extension of the General Requirements (Division 01 of these Specifications) and certain items of a common or administrative nature that pertain to all electrical work.

B. The work of this section consists of furnishing materials, equipment, constant competent supervision, special tools, test equipment, technicians, and labor necessary for installation of a complete working electrical system as indicated herein and on the Drawings.

C. The work shall include but not necessarily be limited to the following:
1. Service entrances and mounting of metering equipment as required by the utility company
2. Connections to service from points of termination by utility company
3. Power Distribution Systems: feeder circuits, branch circuits, panels, wiring, transformers, devices, etc.
4. Installation of motor control and variable frequency drive equipment
5. Electrical work incidental to the requirements of the mechanical system.
6. Wiring and connections to equipment furnished and installed under other Divisions of these specifications
7. Raceways and fittings
8. Grounding
9. Lighting System: fixtures, lamps, wiring, connections, etc.
10. Telecommunications System
11. Lighting control system
12. All required sleeves, thimbles, anchors, hangers, bolts, miscellaneous structural steel, cutting, etc., for the complete installation of the electrical systems serving the building
13. Temporary electrical service for construction and maintenance of occupied portions of the building's electrical systems

1.2 SUBMITTALS

A. Refer to Division 01 - Submittal Procedures for submittal requirements. The following paragraphs are an extension of Division 01 - Submittal Procedures.

B. Review of shop drawings shall in no way modify the contract or relieve the Contractor from compliance with the contract.

C. When electronic submittals are allowed, the Contractor shall also provide to the Architect a minimum of 3 hard copies of the submittal for all submittals that are greater than 25 pages or have a single sheet that is larger than 11" by 17".

D. Names of manufacturers or catalog numbers are listed in the Specification in order to establish a standard for the type, general design and quality of the product required. Where "or approved equal" is indicated, other products similar in design and of equal quality and complying with the Drawings and Specifications will be considered for acceptance. See Division 01 - Substitution Procedures.

E. Any item not specified herein, but submitted as a substitute for the specified item, shall be submitted in accordance with Division 01 - Substitution Procedures and accompanied by manufacturer's documentation stating/illustrating the following applicable information in addition to the specific information requested in other sections:
   1. Dimensions and weight
   2. Electrical Ratings: voltage, amperage, short circuit rating, etc.
   3. Construction - gauge of steel/aluminum, paint finish/application method, color, NEMA type, etc.
   4. Warranty
   5. Local manufacturer's representative or nearest stocking distributor
   6. Any deviations

F. Equipment Requiring Submittals: The following items and equipment require submittals for transmittal. Refer to Phasing Plan for scheduling of submittals. No time delays will be allowed for failure to be so informed.
   1. Conductors
   2. Cables
   3. Hangers & Supports
   4. Raceway & Boxes
   5. Lighting Controls
   6. Wiring Devices
   7. Fuses
   8. Circuit Breakers
   9. Safety Switches
   10. Lighting Fixtures
   11. Lamps
   12. Telecommunication Cabling
   13. Telecommunication Patch Panels
   14. In-slab conduit layout drawing with dimensions

G. Further descriptions or information required with shop drawings shall be included with the description of materials specified herein as follows:

1. Housekeeping Pads: Include location and dimensions of housekeeping pads, including blockouts and anchor bolts.
2. Firestops: Include all firestop materials for the project, indicating intended use and UL fire rating where applicable.
3. Detailed, dimensioned shop Drawings for the installation of the work in the electrical equipment rooms shall be prepared and submitted for review. These Drawings shall be new Drawings prepared by the Contractor and shall not be reproductions or tracings of the Drawings. In preparing shop Drawings, establish lines and levels for the work specified and check the Drawings to avoid interference with structural features and the work of other trades. Immediately call to the attention of the Architect in writing any interference for clarification.
4. Detailed, dimensioned shop drawing for the installation of the conduits to be installed in the floor slab. These shop drawings shall be new drawings prepared by the contractor and shall show all conduit rating, locations where conduits are exiting slab. All junction boxes and concrete rings shall have dimensioned locations. Coordinate conduit "turn-up" or turn downs" with architect. Drawings to insure all conduits will be concealed either in the slab or in the walls.

H. Corrections or comments made on shop Drawings during the review do not relieve the Contractor from compliance with requirements of the contract documents. Shop Drawings will be checked for general conformance with the design concept of the project and general compliance with information given in the contract documents.

I. Review of the shop Drawings shall not relieve the Contractor from responsibility for confirming and correlating all quantities and dimensions, coordinating work with that of all other trades, and performing work in a safe and satisfactory manner. Review of shop Drawings shall not permit any deviation from Drawings and Specifications. Shop Drawings must be accompanied by signed statement from contractor, stating that he has reviewed the submittal and checked it for compliance.

J. Panelboard and switchboard submittals shall be submitted after the major mechanical equipment submittals have been submitted such that general coordination between Divisions can be verified.

1.3 QUALITY ASSURANCE

A. The electrical installation shall conform to the requirements of the 2011 edition of the National Electrical Code (NEC). Notify Architect of any conflicts prior to installation.

B. Electrical material shall be built and tested in accordance with the applicable standards of the National Electrical Manufacturers' Association (NEMA), the American

National Standards Institute (ANSI) the American Society for Testing and Materials (ASTM), and the Institute of Electrical and Electronic Engineers (IEEE)

C. Electrical materials shall be new and unused and shall be listed and labeled for the service intended by Underwriters' Laboratories, Inc., where such labeling service is available.

D. Applicable sections of the following codes and standards shall also be followed:
   1. NFPA - National Fire Protection Association including NFPA-101, Life Safety Code.
   2. OSHA Code of Federal Regulations
   3. IBC - International Building Code as adopted by the local authority having jurisdiction.
   4. Applicable state and local codes and ordinances
   5. ETL - Electrical Testing Laboratories
   6. IES - Illuminating Engineering Society
   7. NECA - National Electrical Contractors Association
   8. UL - Underwriters Laboratories

E. Include all items of labor and materials required to comply with the above referenced codes and standards. Where quantities, sizes, or other requirements indicated on Drawings or herein specified are in excess of the requirements of the standards and codes, the Specifications or Drawings shall govern.

1.4 REGULATORY REQUIREMENTS

A. Permits: Obtain and pay for all necessary permits, inspections, connection charges, fees, insurance, bond, licenses, and comply with all governing laws, ordinances, rules and regulations including those of the NFPA and all municipal, state or other authority having jurisdiction over the work.

B. Certificates of Inspection: Upon completion and before the date of substantial completion of each designated Phase, furnish a certificate of inspection issued by the proper authorities to the effect that the installation is in full conformity with all local and state requirements.

1.5 COORDINATION

A. Layout the work and be responsible for its correctness. Take such measurements as may be necessary to assure approved fitting and proper installation of work, and all other work depending thereon.

B. Arrange work in a neat, well organized manner with exposed conduit and similar services running parallel with primary lines of the building construction, high as possible with a minimum of 8'-0" overhead clearance or as directed by the Architect.

C. Perform all work in the best and most substantial manner by workmen skilled in the work to be done. Provide adequate supervision at all times.

D. Cooperate with other contractors to avoid complications between the installation of the various items of equipment. Advise other trades of openings required in their work for the subsequent move-in of large units of electrical equipment.

E. Locate operating and control equipment properly to provide easy access, and arrange entire electrical work with adequate access for operation and maintenance.

F. Where the method of installation is not certain, ask for details. Lack of details, not requested, will not be an excuse for improper installation, and any such work must be corrected.

G. Coordination Drawings: For locations where several elements of electrical or combined mechanical and electrical work must be sequenced and positioned with precision in order to fit into the available space, prepare coordination drawings showing the actual physical dimensions (at accurate scale, minimum 1/4") required for the installation. Prepare and submit coordination drawings prior to purchase-fabrication-installation of any of the elements involved in the coordination.

H. All Bidders shall be responsible to insure that equipment selected: switchboards, panelboards, etc., fit in spaces selected, and meet all NEC 110.26 requirements. If standard equipment does not fit, Contractor shall be required to utilize custom equipment as required.

1.6 DRAWINGS AND SPECIFICATIONS

A. Contract Documents (Drawings and Specifications) are intended to convey the scope of work and indicate general arrangements of equipment, fixtures and piping, and approximate sizes and locations of equipment and outlets. Follow these documents in laying out the work, check all Drawings to become familiar with all conditions affecting the work, and verify spaces in which the work will be installed.

B. The contract documents are diagrammatic in showing certain but not all, physical relationships which must be established within the electrical work. Its interface with other work including plumbing, fire protection and mechanical work is the exclusive responsibility of the Contractor.

C. The Drawings show approximate locations only of selected feeders, branch circuits, outlets, etc., except where specific routing or dimensions are indicated. The Architect reserves the right to make reasonable changes in locations indicated before roughing-in without additional cost to the Owner. The Contractor, at a minimum,

should allow all feeders, branch circuits, and outlets shown to be relocated 10 feet in any direction without additional cost to the Owner.

D. Because of the small scale of the Drawings, it is not possible to indicate all of the offsets, fittings, and accessories required. Contractor shall investigate the structural and finish conditions affecting Division 26, Electrical work and shall arrange such work accordingly, furnishing fittings, bends, junction boxes, pull boxes, access panels, and accessories required to meet such conditions.

E. These Specifications, together with the accompanying Drawings, contemplate apparatus fully erected, and in satisfactory operating condition with the Contractor furnishing and installing everything that may be necessary to complete the job.

1.7 PROJECT/SITE CONDITIONS

A. Visit the site before bidding to become familiar with conditions under which the work will be performed.

B. No additional compensation will be allowed for failure to be so informed.

1.8 RECORD DRAWINGS

A. Prepare Record Drawings in accordance with the requirements in Division 01 - Closeout Procedures. The following paragraphs are in addition to Division 01 - Closeout Procedures.

B. In addition to the requirements specified in Division 01 - Closeout Procedures, indicate the following installed conditions:
   1. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
   2. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
   3. Contract Modification, actual equipment and materials installed.
   4. Complete As-Built Drawings of Division 26, Electrical work shown and not shown on the contract drawings in the new and existing facilities.

C. Equipment Manuals:
   1. Before the date of substantial completion, Contractor shall furnish to the Architect three (3) bound sets of descriptive, dimensional and parts data on all major items of electrical equipment and material including those items listed above under "Shop Drawings:".
   2. Each set of this literature shall be bound in a permanent type hard cover ring binder and shall be suitably indexed.

3. This submittal shall be accompanied by final Electrical Inspection Certificate from the authority having jurisdiction and Statement of Inspection from State Fire Marshal's Office.

1.9 WARRANTY

A. Except where longer periods of warranty are specified, guarantee all labor and materials for a period of twelve (12) months from the date of substantial completion of the particular phase of the work. Repair all defective materials and work; replace with new materials and/or equipment, any material and/or equipment failing to give satisfactory service.

B. During the period of guarantee, promptly correct any defects in equipment, materials or workmanship without cost to the Owner.

C. Guarantee includes equipment capacity and performance ratings specified without excessive noise levels. Any deficiencies in equipment specified shall be promptly corrected.

D. Contractor's warranty shall include an inspection of the system one (1) week before the end of the one (1) year warranty period. Replace or repair any items found to be defective at this time.

1.10 TESTS AND BALANCING

A. At such times as the Architect directs, conduct operating tests to demonstrate that the electrical systems are installed and will operate properly and in accordance with the requirements of this Specification. Tests shall be performed in the presence of the Architect's representative. Furnish instruments and personnel required for such tests.

B. All power and lighting loads shall be tested by Contractor prior to final approval.

C. Any work and materials tested and found varying from the requirements of the Drawings and Specifications shall be replaced without additional cost to the Owner.

D. This section does not relieve the Contractor from testing equipment installed under this Division but not listed in this section. Contractor is required to test all equipment, feeders, etc., installed under this Division.

PART 2 - PRODUCTS

2.1 GENERAL

A. Refer to Division 01 sections for general requirements on products, materials and equipment. The provisions outlined below expand or modify the requirements as applicable to electrical work. Refer to other Division 26, Electrical sections for additional requirements.

B. Materials and equipment shall conform in all respects to the requirements set forth in these Specifications and the accompanying Drawings.

C. Provide products which are compatible with other products of the electrical work, and with other work requiring interface with the electrical work, including electrical connections and control devices. For exposed electrical work, coordinate colors and finishes with the Architect and as referenced in Section 09 91 23. Determine in advance of purchase that equipment and materials proposed for installation will fit into the confines indicated, leaving adequate clearance as required by applicable codes, and for adjustment, repair, or replacement.

2.2 FIREPROOFING:

A. Where conduit and/or cables penetrate fire-resistant/rated walls, partitions, ceilings, or floors, adequate fire seals using approved UL methods to maintain the fire-resistance rating shall be provided and installed in accordance with Division 07, Section "Firestopping".

B. Approved methods constitute providing a minimum of one-inch (1") depth of Scotch Putty 303 or Caulk CP25.3 surrounding metal conduit penetrations. Larger square or circular penetrations shall require construction of fire-rated barrier utilizing Scotch Series 7903/7904 barrier sheets.

C. Plastic sleeves/pipe shall not be used within the building when penetrating a fire-resistant-rated wall, ceiling, partition, or floor.

D. All fire proofing to be certified.

2.3 INSERTS AND THIMBLES

A. Set in place as form work progresses, all necessary inserts and thimbles as may be required. Cutting of beams or of concrete floors or walls will not be permitted.

B. All thimbles set in concrete shall be of standard pipe, plain ends, and shall be of proper size to allow for freedom around piping passing through thimble.

C. Thimbles set in the walls, partitions or in chases where structural requirements will allow, shall be of rigid galvanized steel conduit.

D. Inserts shall be nailed to form work and shall be of size to allow for installation of hangers for the particular pipe served.

2.4 MANUFACTURERS' NAMEPLATES

A. Each major component of the equipment shall have the manufacturer's name, address, model number, and rating on a plate securely affixed in a conspicuous place. The nameplate of a distributing agent will not be acceptable. NEMA Code ratings, or other data which are die-stamped into the surface of the equipment shall be stamped in an easily visible location.

PART 3 - EXECUTION

3.1 GENERAL

A. Visit the building site before bidding to determine existing conditions and assume all responsibility and bear all expenses in allowing for these conditions in the bid.

B. No work shall be concealed until approved by the local inspector and all local regulations are adhered to.

C. Upon completion, a certificate of approval from the appropriate regulatory agency shall be furnished to the Architect.

D. Study all sections of the Specifications and Drawings. Notify Architect of conflict between Drawings and Specifications before bidding.

E. Electrical Drawings are diagrammatic except where dimensioned. Do not scale. Follow manufacturers certified shop drawings for accuracy. Unless noted as fixed, dimensions are based on the product of one (1) manufacturer. Verify dimensions with certified shop Drawings of the materials actually approved and purchased.

3.2 PROTECTION OF APPARATUS

A. At all times the Contractor shall take precautions necessary to protect his apparatus from damage. Failure on the part of the Contractor to comply with the above to the Architect's satisfaction shall be sufficient cause for the rejection of the particular piece of apparatus in question.

3.3 CUTTING AND PATCHING

A. Do all cutting, fitting, and all other work that may be required to make the several parts come together and fit. Cutting for equipment entry shall be under other Divisions. Do not endanger any work by cutting, digging, or otherwise, and do not cut or alter the work of any other Divisions, except with the consent of the Architect. Cutting shall be done under the supervision of the Project Superintendent. Patching, including patching of bonded roofing, shall be performed under Division 02.

B. Provide, properly located and sized, all required chases, shafts, openings, furred spaces, etc., required for the work or to conceal any of the work, in any part of the structure.

C. It is the responsibility of this Division to coordinate with other responsible Divisions for required cutting and patching.

3.4 TEMPORARY WIRING, LIGHTING AND POWER AT THE SITE

A. Furnish and install provisions for temporary electrical service and construction light and power during the construction period conforming to the contract documents, all local code and State labor law requirements.

B. Arrange for temporary service with the Utility Company.

C. Furnish, install, and maintain all temporary service equipment as required until permanent service is installed switch-over of temporary systems on the permanent service when latter is ready for same.

D. Furnish, install, maintain, and switch on and off on all regular work days a complete temporary light system, for the building while under construction.

E. Provide any and/or all relocations of temporary electric facilities as necessary to clear the permanent installations of all trades.

3.5 WIRING FOR EQUIPMENT BY OTHERS

A. Electrical service for all equipment furnished under this Specification and/or indicated on the Drawings shall be roughed-in and connected under this Section. It is the responsibility of the Contractor to obtain correct roughing-in dimensions and requirements for this equipment.

B. Raceways, outlets, backboards, cabinets, grounding connections, handholes, underground distribution system, and other roughing-in indicated shall be provided as work of this division for telephone system, security system and data system.

3.6 MECHANICAL EQUIPMENT

A. All power wiring associated with Division 21, Fire Suppression, Division 22, Plumbing, and/or Division 23, HVAC shall be done as work under Division 26, Electrical. All power disconnect switches and single speed manual starting switches shall be furnished and installed under Division 26. Multi-speed manual starters, magnetic starters, variable frequency drives shall be furnished under Division 21, Fire Suppression, Division 22, Plumbing, and/or Division 23, HVAC and installed under Division 26, Electrical.

B. Except as may be indicated on the Drawings and/or hereinafter noted, all control wiring, including all temperature control wiring, interlocking, start-stop wiring, shall be furnished and installed under Division 21, Fire Suppression, Division 22, Plumbing, and/or Division 23, HVAC. This includes, but is not limited to, wiring to low voltage thermostats, damper motors, aquastats, firestats, pushbuttons, selector switches, and control panel(s). All disconnect switches for control shall be furnished and installed under Division 21, Fire Suppression, Division 22, Plumbing, and/or Division 23, HVAC. Wiring, conduit, and control shall meet the requirements of Division 26, Electrical.

C. Work of other divisions will include furnishing and setting motors.

D. All magnetic starters and variable frequency drives will be furnished under Division 26, Electrical, except for packaged equipment that will be furnished under another division of the Specifications. Overload elements in all starters shall be selected according to actual motor nameplate full load current. Responsibility for this coordination shall lie with the division under which the particular starter was furnished.

E. Firestats for single phase exhaust fans with manual starting switches and wall mounted thermostats which interrupt line voltage power circuits to motors shall be furnished and set under Division 21, Fire Suppression, Division 22, Plumbing, and/or Division 23, HVAC, and electrically connected in the branch circuit wiring as work of Division 26, Electrical.

3.7 WORKMANSHIP

A. Install all materials and electrical components of the work in accordance with instructions of manufacturer following the best modern construction practices and conforming with the Contract Documents. Workmanship shall be first class, in both function and appearance, whether finally concealed or exposed and shall be performed by experienced workmen skilled in the type of work.

B. As practicable, the lines of all components of the system shall be perpendicular or parallel. In general, workmanship shall conform to guidelines set forth in N.E.C.A. manuals.

3.8 CLEANING UP

A. Remove once per week and at the completion of the work all empty cartons, scrap wire, raceways, rubbish, etc., accumulated on the project as a result of work performed.

B. Remove all marks, stains, fingerprints, bugs, dust and other foreign material from all electrical components. Refinish damaged surfaces and restore original finish to the satisfaction of the Architect.

3.9 CONTRACTOR OPERATIONAL TESTING

A. Contractor shall verify proper operation of systems prior to Owner acceptance testing and prior to substantial completion.

3.10 SAFETY

A. It shall be the Contractor's responsibility to do all things necessary in the pursuit of the installation or testing to provide safe conditions in which to work.

END OF SECTION

SECTION 26 0501
ELECTRICAL RELATED WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Extent of electrical related work required by this section is indicated on Drawings and/or specified in other Division 26, Electrical sections.

B. Types of electrical related work specified in this section include the following:
   1. Access to Electrical Work: Removable cover plate in walls, ceiling and floors
   2. Excavating, Trenching and Backfill for Electrical Work
   3. Foundations and Supports
   4. Cutting and patching
   5. Concrete for Electrical Work:
      a. Encasement of electrical work
      b. Underground structural concrete to accommodate electrical work
      c. Electrical equipment foundations and mounting pads
      d. Rough grouting in and around electrical work
      e. Patching concrete which has been cut to accommodate electrical work

1.2 PROJECT/SITE CONDITIONS

A. Protect property from damage which might result from excavating and backfilling.

B. Protect persons from injury at excavations by barricades, warnings and illumination.

C. Coordinate excavations with weather conditions, to minimize possibility of washouts, settlements and other damages and hazards.

1.3 ACCESS TO ELECTRICAL WORK

A. Access Doors: General: Where floors, walls and ceilings must be penetrated for access to electrical work, provide types of access doors indicated by project conditions, including floor doors if any. Furnish sizes indicated or, where not otherwise indicated by project conditions, furnish adequate size for intended and necessary access. Furnish manufacturer's complete units, of type recommended for application in indicated substrate construction, in each case, completes with anchorages and hardware.

B. Access Door Construction: Except as otherwise indicated, fabricate wall/ceiling door units of welded steel construction with welds ground smooth; 16-gage frames and 14-gage flush panel doors, 175 degree swing with concealed spring hinges; flush screw-driver-operated cam locks; factory-applied rust-inhibitive prime-coat paint finish.

C. Removable Access Plates: General: Where switches, control devices, pull boxes, and similar elements of electrical work are located within or behind wall or ceiling construction of finishes, or below grade, and are not (cannot be) provided with integral removable access plates as specified in other Division-26 Electrical, sections, provide removable access plates of types and sizes needed for access requirements. Provide manufacturer's complete units with anchorages, fasteners, and standard factory-applied finishes.

D. Wall/Ceiling Unit Construction: Except as otherwise indicated, and where adaptable to substrate, provide manufacturer's standard frameless round formed stainless steel or chrome-plated brass low-profile plate cover, with single exposed flush screw anchor, with bright polished finish.

E. Units Set at Grade: Except as otherwise indicated, provide manufacturer's standard round or square cast-iron units, complete with cast-iron pipe extension to protect electrical elements being accessed; designed to be set slightly above finish grade, and to be encased in concrete; secure plate to body with bronze screws; natural mill finish on plate and body.

1.4 EXCAVATING FOR ELECTRICAL WORK

A. Backfill Materials: Refer to Division 31 Section, Earth Moving.

B. Materials of Concrete Work: Refer to Division 03 Section, Concrete.

1.5 DUCT BANK COLORING

A. All underground and above grade concrete electrical duct banks shall be colored red.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 EXCAVATION, TRENCHING AND BACKFILLING

A. Perform all excavation of every description and of whatever substances encountered to the depths indicated on the Drawings or as otherwise specified. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or not suitable for backfill shall be removed and wasted or removed from jobsite as indicated on the Drawings or as directed by Architect at no additional cost to Owner.

B. Sheeting and shoring shall be done as necessary for the protection of the work and for the safety of personnel. Provide necessary pumping and/or well pointing at all

times to maintain a dry working condition in all trenches. Unless otherwise indicated, excavations shall be by open cut except that short sections of a trench may be tunneled if, in the opinion of the Architect the conduit can be safely and properly installed and backfill can be properly tamped in such tunneled sections.

C. No excavation or trenches shall be cut near or under footings without first consulting Architect.

D. Where open cut excavations/trenches are near tree root system, consult architect for directions prior to excavation. Contractor shall ultimately be responsible for installations of conduits by methods best suited to preserve tree root systems as per architect directions.

E. Bottom of trench shall be shaped to give substantially uniform circumferential support to lower third of each pipe. Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with adjoining pipe and to prevent sudden offset to flow line. As work progresses, interior of pipe shall be cleared of dirt and superfluous materials of every description.

F. Wherever wet or otherwise unstable soil that is incapable of properly supporting the pipe, as determined by the Architect is encountered in the bottom of the trench, such soil shall be removed to the depth required and the trench backfilled to the proper grade with coarse sand, fine gravel, or other suitable material, and approved by the Architect.

G. Trenches for utilities shall be of a depth that will provide the following minimum depth of cover from existing grade or from indicated finish grade, whichever is lower, unless otherwise specifically shown:
   1. 30-inch minimum cover - electrical conduits/cables over 600 volts
   2. 24-inch minimum cover - electrical cables/conduits under 600 volts

H. Backfill shall be installed in layers 6" deep, adequately wetted and tamped using materials as noted above. The surface shall be graded to a reasonable uniformity and the mounding over trenches left in a uniform and neat condition as approved by the Architect. Refer to plans for compaction densities.

I. Restore all hard finished surfaces such as roadways, sidewalks, grass, shrubbery, etc., removed for installation of utilities (and not shown on Drawings or specified to be reworked under other sections of the work) to their original condition using the same type as original materials. Patching concrete roadways shall require doweling to tie-in matching reinforcement rods or highway mesh to existing roadway. Doweling shall occur every 18 inches on both sides of the trench. Restore to near original condition acceptable to Architect.

J. Carefully plan all work to avoid existing utilities and other interferences. The Drawings do not indicate all existing underground utilities. Existing utility lines to be

retained that are shown on the Drawings or the locations of which are made known to the Contractor prior to excavation, as well as all utility lines uncovered during excavation operations, shall be protected from damage during excavation and backfilling and, if damaged, shall be repaired by Contractor at his expense. Prior to doing any excavation with power tools, carefully investigate and locate any exiting conduit, pipes, and other lines.

K. Install access units in accordance with manufacturer's written instructions, in compliance with NEC and recognized industry practices.

L. Coordinate with other work, including substrate construction work, as necessary to interface installation of access units with other work.

M. Locate each removable access unit accurately in relation to electrical work requiring access.

N. Provide adequate temporary support or attachment to framing or form work so that units will not be dislocated during construction of substrates. Set frames accurately in position and securely attach to supports with face panels plumb or level in relation to adjacent finish surfaces.

O. Adjust hardware and panels after installation for proper operation.

P. Remove and replace panels or frames, which are warped, bowed or damaged.

3.2 PAINTING

A. Factory painted equipment shall have finish restored to Manufacturer's finish if scratched or damaged before acceptance or use by Owner.

END OF SECTION

SECTION 26 0519
LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes wires, cables, and connectors for power, lighting, signal, control and related systems rated 600 volts and less.

B. Related Sections include the following:
   1. Section 26 05 26 - Grounding & Bonding
   2. Section 26 05 29 - Hangars & Supports for Electrical Systems
   3. Section 26 05 33 - Raceways & Boxes for Electrical Systems

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with provisions of the NEC.

B. Conform to applicable Codes and regulations regarding toxicity of combustion products of insulating materials.

C. UL Compliance: Provide components which are listed and labeled by UL under the following standards.
   1. UL 4
   2. UL 83
   3. UL 486

D. NEMA/ICEA Compliance: Provide components which comply with the following standards:
   1. WC-5 Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy IEEE Compliance: Provide components which comply with the following standard.
   2. Std. 82 Test procedures for Impulse Voltage Tests on Insulated Conductors.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver wire and cable according to NEMA WC-26

1.5 COORDINATION

A. Coordinate layout and installation of cable with other installations. Revise locations and elevations from those indicated as required to suit field conditions and as approved by the Architect.

PART 2 PRODUCTS

2.1 CONDUCTORS AND CABLES

A. General: Provide wire and cable suitable for the temperature, conditions and location where indicated.

B. Conductors: Provide stranded conductors for power and lighting circuits #12 AWG minimum size. Provide stranded conductors for size #14 AWG for control circuits.

C. Multi-conductor Cable: Comply with NEMA WC 70 for Metal-Clad, Type MC, with ground wire. Interlocking Aluminum Strip Armor with polypropylene tape assembly covering. Meets UL 83, 1479 1569, and 1581.

D. Conductor Material: copper for all wires and cables.

E. Aluminum conductors shall not be used.

F. Insulation: Provide 600 volt THHN/THWN insulation for all conductors unless otherwise noted.

G. Color Coding for phase identification in accordance with Table 1 in Part 3 below.

H. Jackets: Factory-applied nylon or PVC external jacketed wires and cables for pulls in raceways over 100-feet in length, for pulls in raceways with more than three equivalent 90 deg. bends, for pulls in conduits underground or under slabs on grade, and where indicated.

I. Cables: Provide the following type(s) of cables in NEC approved locations and applications where indicated. Provide cable UL listed for particular application:
   1. Armored Cable.
   2. Factory manufactured and listed fixture whips.

2.2 ACCESSORIES

A. Provide UL-listed factory-fabricated, solderless metal connectors of sizes, ampacity ratings, materials, types and classes for applications and for services indicated. Use connectors with temperature ratings equal to or greater than those of the wires upon which used.

B. For conductors larger than #6 AWG use compression type connectors only for splices and terminations to equipment where possible.

C. At cable size transition splices use compression connectors, with bolted connection if necessary. Use bolted compression or tee connections where the number of connections exceed two.

D. Split bolts and mechanical connectors may only be used if a compression method is not feasible.

E. Push-in wire connector shall not be used.

PART 3 EXECUTION

3.1 APPLICATIONS

A. Service Entrance: Type THWN, copper conductor, in raceway.

B. Feeder and Branch Circuits: Type THHN/THWN, copper conductor, in raceway.

C. Class 1 Control Circuits: Type THHN/THWN, copper conductor in raceway.

D. Class 2 Control Circuits: Type THHN/THWN, copper conductor in raceway.

E. MC Cable may be installed in the following conditions:
   1. Connections to light fixtures in lay-in ceilings. Minimum inside diameter shall be 1/2".
   2. For all recessed and semi-recessed lighting fixtures in lay in ceilings, the cable shall be long enough to allow fixtures to be moved one ceiling grid space in any direction.
   3. Between devices on the same circuit with a maximum length of 40'.

3.2 INSTALLATION

A. Install all power wire in raceway as indicated in Section 26 05 33.

B. General: Install electrical cables, wires, and connectors in compliance with NEC.

C. Coordinate cable installation with other Work.

D. Pull conductors simultaneously where more than one is being installed in same raceway. Use UL listed pulling compound or lubricant, where necessary.

E. Use pulling means including, fish tape, cable, rope, and basket weave wire/cable grips which will not damage cables or raceways. Do not use rope hitches for pulling attachment to wire or cable.

F. Conceal all cable in finished spaces.

G. Install exposed cable parallel and perpendicular to surfaces or exposed structural members, and follow surface contours, where possible.

H. Keep conductor splices to minimum.

I. TAPS and splices of #6 AWG and larger shall use compression bolted connectors. Splices in #8 AWG and smaller shall be made using preinsulated wing-nut spring tension connectors manufactured by 3-M Scotch, Ideal, or approved equal.

J. Install splice and tap connectors which possess equivalent or better mechanical strength and insulation rating than conductors being spliced.

K. Use splice and tap connectors which are compatible with conductor material.

L. Provide adequate length of conductors within electrical enclosures and train the conductors m terminal points with no excess. Bundle multiple conductors, with conductors larger than #10 AWG cabled in individual circuits. Make terminations so there is no bare conductor at the terminal.

M. Wiring at Outlets: Install with at least 9 inches of slack conductor at each outlet.

N. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where

manufacturer's torque requirements are not indicated, tighten connectors and terminals to comply with tightening torque's specified in UL 486A and UL 486B.

O. Minimum size power and lighting wiring shall be #12 AWG.

P. Motor control circuits may be #14 AWG.

Q. Use #10 AWG conductor for 20 amp. 120 volt branch circuit home runs longer than 100 ft., and for a 277 volt branch circuit home runs longer than 200 ft.

R. Conductor derating: Derate conductor ampacity in accordance with NEC raceway fill requirements. Do not fill raceways so that conductor derating will exceed 50 percent. Harmonic loading shall be considered for circuits serving office and/or classroom spaces.

S. Power Branch circuit neutrals: Provide separate grounded conductor (neutral) for each receptacle circuit 15 and/or 20 amps, that serves office and/or classroom spaces. Harmonic's shall be assumed in these areas.

T. Power branch circuits for receptacles in mechanical spaces, rooftop, outside convenience outlets, and other similar locations may use shared grounded conductors.

U. Identify phases on at all termination and splice points, by a following method and as required by the NEC:
   1. For conductors #6 AWG and larger use color tape, at least 4 inches at each required location.
   2. For conductors smaller than #6 AWG, marking shall be completed with continuous insulation color. These conductors shall not be color taped.

3.3 FIELD QUALITY CONTROL

A. Prior to energizing, check installed wires and cables with mega-ohm meter to determine insulation resistance levels to assure requirements are fulfilled.

B. Prior to energizing, test wires and cables for electrical continuity and for short-circuits.

C. Subsequent to wire and cable hook-ups, energize circuits and demonstrate proper functioning. Correct malfunctioning units, and retest to demonstrate compliance.

D. Color code secondary service, feeder, and branch circuit conductors with factory applied color as follows:

208Y/120 Volts	Phase	480Y/277 Volts
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray
Green	Ground	Green
Green with Yellow Stripe	Isolated Ground	

END OF SECTION

SECTION 26 0526
GROUNDING & BONDING

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section consists of providing labor, materials, tools, appliances and miscellaneous accessories associated with grounding of the electrical system as required by and as is indicated herein and/or on the Drawings.

1.2 SCOPE OF WORK

A. Main electric service equipment, raceways, motors, panelboards and other electrical equipment shall be effectively and permanently grounded to a grounding electrode. This electrode shall be the nearest available effectively grounded structural metal member of the structure or the nearest available effectively grounded metal water pipe and also a driven rod. Grounding connections and conductor sizes shall be in accordance with requirements of the NEC, Article 250, and local ordinances, and as described herein.

B. A separate grounding conductor, sized in accordance with NEC shall be provided in the conduit with the circuit conductors for all feeder and branch circuits. The grounding conductor may be bare or insulated copper; however, if this conductor is insulated, the insulating covering shall be a green color. Conduit runs shall be increased in size where necessary to accommodate the grounding conductor in addition to circuit conductors. The electrical continuity of all conduit runs shall be verified and corrected where necessary.

C. Isolated Ground Connectors shall be insulated. Additional grounding conductors and conduit shall be provided as specified herein or shown on the drawings. All conduit for grounding system conductors, not run in conduit with circuit conductors, shall be rigid steel conduit.

D. All electrical equipment enclosures and conductor enclosures shall be grounded. This includes but is not limited to metal raceways, outlet boxes, cabinets, switch boxes, motor frames, transformer cases and metallic enclosure for all electrical equipment.

E. Under no circumstances shall neutral conductors again be grounded after they have been grounded once at the transformer secondary.

F. Panelboards shall be equipped with a neutral bar which is insulated from the enclosure, and a grounding bar which is bonded to the enclosure. The grounding bar shall provide for terminating the green equipment grounding conductors in the panelboard or motor control center cabinets. The grounding bar shall be bonded to the cabinet. Neutral busses shall be isolated from ground except at the transformer ground connection.

G. Types of grounding in this section include the following:
   1. Underground metal water piping
   2. Grounding electrodes
   3. Service equipment
   4. Enclosures
   5. Systems
   6. Equipment

H. Requirements of this section apply to electrical grounding work specified elsewhere in these specifications.

I. Provide Bonding Jumper across water meter.

1.3 SUBMITTALS

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

B. Other Informational Submittals:
   1. Test wells.
   2. Ground rods.
   3. Ground rings.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS

A. General: Except as otherwise indicated, provide electrical grounding and bonding systems indicated, with assembly of materials including, but not necessarily limited to, cables/wires, connectors, terminals (solderless lugs), grounding rods/electrodes, bonding jumper braid, surge arrestors and other items and accessories needed for complete installation. Where more than one type meets indicated requirements, selection is Installer's option. Where materials or components are not otherwise indicated, comply with NEC, UL and IEEE requirements and with established industry standards for applications indicated.

B. Bonding Jumper Braid: Copper braided tape, constructed of 30-gage bare copper wires and properly sized for indicated applications.

C. Flexible Jumper Strap: Flexible flat conductor, 480 strands of 30-gage bare copper wire, 3/4" wide, 9-1/2" long, 48, 250 CM. Protect braid with copper bolt hole ends with holes sized for 3/8" dia. bolts.

D. Grounding Conductors: Unless otherwise indicated, provide electrical grounding conductors for grounding connections matching power supply wiring materials and sized according to NEC.

E. Connectors, Terminals and Clamps: Provide electrical bonding plates, connectors terminals and clamps as recommended by bonding plate, connector, terminal and clamp manufacturers for indicated applications.

F. Ground Electrodes: Ground Rods: Steel with copper welded exterior, 5/8" dia. X 10'.

G. Electrical Grounding Connection Accessories: Provide electrical insulating tape, heat-shrinkable insulating tubing, solder, soldering flux, bonding straps, as recommended by accessories manufacturers for type services indicated.

H. Field Welding: Comply with AWS code for procedures, appearance, and quality of welds and methods used in connecting welding work. Provide welded connections where grounding conductors connect to underground grounding rods/electrodes.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install electrical grounding and bonding systems as indicated, in accordance with manufacturer's written instructions and with recognized industry practices to ensure grounding and ground-fault protection devices comply with requirements. Comply with requirements of NEC, and NECA's "Standard of Installation".

B. Coordinate with other electrical work as necessary to interface installation of grounding system and ground fault protection devices with other work.

C. Cadweld grounding conductors to underground grounding electrodes. The building equipment grounding system shall consist of the ground wire, and electrically continuous metallic conduit system. Every item of equipment served by the electrical system shall be bonded to the building equipment ground.

D. Portions of metallic piping and duct systems which are electrically isolated shall be bonded to the equipment grounding system with a flexible bonding jumper.

E. The neutral shall be grounded to the grounding electrode system at the service entrance only, and shall be kept isolated from the building grounding system throughout the building. The neutral of separately derived systems shall be grounded at one point.

F. Provide bonding and grounding wires run in conduit and sized per the NEC in accordance with the local electrical inspection department and the NEC. Metallic piping and duct systems which enter the building shall be grounded at the point of entry to the building, in accordance with the NEC.

G. Continuity of the building equipment grounding system shall be maintained throughout the project. Grounding jumpers shall be installed across conduit expansion fittings, all liquid-tight flexible metal and flexible metal conduit, light fixture pigtails in excess of 6', and all other nonelectrically continuous raceway fittings.

H. All main grounding conductors shall be stranded copper conductors, sized as shown and/or required, and run in a suitable raceway. All main grounding conductors shall be continuous without joints or splices over their entire length.

I. Bond the case and neutral of each transformer directly to the nearest available effectively grounded structural metal member of the structure, the nearest available

effectively grounded metal water pipe, or in accordance with the local electrical inspection department. Flexible conduit shall not be used as a ground path to a transformer.

J. Provide a #6 ground conductor from the telephone service equipment to the building grounding system as required by the local Telephone Company.

K. Carefully and securely ground all fluorescent fixture bodies to the conduit grounding system. Flexible conduit longer than 6' shall not be considered a ground path.

L. Ground all grounding-type receptacles with a separate ground wire.

M. Grounding of all motors or equipment connected to terminal box with flexible conduit shall be made with separate grounding conductor between motor frame or equipment cabinet and rigid conduit system. Grounding conductor shall be sized in accordance with NEC Table 250.122.

N. All grounding conductors shall be amply protected from mechanical injury and shall be supported in an approved manner. Where conductors are located in concrete, they shall be installed in conduit. Where ground conductors enter or emerge from slabs bearing directly on fill or soil, the voids between the conductor and surrounding conduit shall be filled with compound to provide an effective water seal.

O. Grounding conductors shall be not smaller than #12 AWG. Conductors shall be high conductivity copper, and sizes larger than #10 AWG shall be stranded.

P. Insulated bushings shall be installed on all raceways at transformers, switchboards, motor-control centers, dry-type transformers, as well as switches used as service equipment.

Q. Install braided type bonding jumpers with clamps on water meter piping to electrically bypass water meter.

R. Install clamp-on connectors only on thoroughly cleaned metal contact surfaces, to ensure electrical conductivity and circuit integrity.

S. For all motor circuit and all circuits serving multi-outlet assemblies provide a separate grounding conductor in addition to any conduit ground. Conduit runs shall be increased in size where necessary to accommodate the grounding conductor in addition to circuit conductors.

3.2 FIELD QUALITY CONTROL

A. Upon completion of installation of electrical grounding system, test ground resistance with ground resistance tester. Where tests show resistance-to-ground is over 3 ohms, take appropriate action to reduce resistance to 3 ohms or less by driving additional ground rods and/or by chemically treating soil encircling ground rods with sodium chloride, calcium chloride, copper sulphate, or magnesium. Then retest to demonstrate compliance.

END OF SECTION

SECTION 26 0529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes secure support from the building structure for electrical items by means of hangers, supports, anchors, sleeves, inserts, seals, and associated fastenings.

B. Related Sections include the following:
   1. Division 03 Section "Cast-in-place Concrete" for inserts, anchors, and sleeves to be installed in concrete for use with supporting devices.
   2. Division 05 Section "Metal Fabrications" for requirements for miscellaneous metal items involved in supports and fastenings.
   3. Division 07 Section "Joint Sealants" for requirements for fire stopping at sleeves through walls and floors that are fire barriers.
   4. Section 26 05 00 - Common Work for Electrical

1.2 SUBMITTALS

A. Product data for each type of product specified.

B. Hanger and support schedule showing manufacturer's figure number, size, spacing, features, and applications for each required type of support, hanger, sleeve, seal, and fastener to be used.

1.3 QUALITY ASSURANCE

A. Electrical Component Standard: Component and installation shall comply with NEC & NECA "Standard For Installation"

B. Electrical components shall be listed and labeled by UL, ETL, CSA, or other approved, nationally recognized testing and listing agency that provides third party certification follow-up services.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Raceway Supports: Clevis hangers, riser clamps, conduit straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps

B. Fasteners: Types, materials, and construction features as follows:

C. Expansion Anchors: Carbon steel wedge or sleeve type.

D. Toggle Bolts: All steel springhead type.

E. Powder-Driven Threaded Studs: Heat-treated steel, designed specifically for the intended service.

F. Conduit Sealing Bushings: Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit, or tubing passing through concrete floors and walls. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.

G. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non armored electrical cables in riser conduits. Provide plugs with number and size of conductor gripping holes as required to suit individual risers. Construct body of malleable-iron casting with hot-dip galvanized finish.

H. U-Channel Systems: 16-gage steel channels, with 9/16-inch-diameter holes, at a minimum of 8 inches on center, in top surface. Provide fittings and accessories that mate and match with U-channel and are of the same manufacture.

2.2 FABRICATION

A. General: Shop- or field-fabricated supports or manufactured supports assembled from U-channel components.

B. Steel Brackets: Fabricated of angles, channels, and other standard structural shapes. Connect with welds and machine bolts to form rigid supports.

C. Pipe Sleeves: Provide pipe sleeves of one of the following:

D. Sheet Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate sleeves from the following gage metal for sleeve diameter noted:
   1. < 4": 20-gage
   2. 4" to 6": 16-gage
   3. > 6": 14-gage
   4. Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe
   5. Plastic Pipe: Fabricate from Schedule 80 PVC plastic pipe

2.3 FINISHES

A. Coating: Supports, support hardware, and fasteners shall be protected with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic. Products for use outdoors shall be hot-dip galvanized.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install supporting devices to fasten electric components securely and permanently in accordance with NEC requirements, NECA 1, NECA 101, and with support manufacturer instructions.

B. Coordinate with the building structural system and with other electrical installation.

C. Tie-wraps shall not be used.

D. Raceway Supports: Comply with the NEC and the following requirements:
   1. Conform to manufacturer's recommendations for selection and installation of supports.
   2. Strength of each support shall be adequate to carry present and future load multiplied by a safety factor of at least four. Where this determination results in a safety allowance of less than 200 lbs, provide additional strength until there is a minimum of 200 lbs safety allowance in the strength of each support.
   3. Install individual and multiple (trapeze) raceway hangers and riser clamps as necessary to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.
   4. Support parallel runs of horizontal raceways together on trapeze-type hangers.
   5. Support individual horizontal raceways by separate pipe hangers. Spring steel fasteners may be used in lieu of hangers only for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings only. For hanger rods with spring steel fasteners, use 1/4-inch-diameter or larger threaded steel. Use spring steel fasteners that are specifically designed for supporting single conduits or tubing.
   6. Space supports for raceway in accordance with NEC.
   7. Support exposed and concealed raceway within 1 foot of an unsupported box and access fittings. In horizontal runs. support at the box and access fittings may be omitted where box or access fittings are independently supported and raceway terminals are not made with chase nipples or threadless box connectors.
   8. In vertical runs, arrange support so the load produced by the weight of the raceway and the enclosed conductors is carried entirely by the conduit supports with no weight load on raceway terminals.

E. All hangers installed below the slab shall be stainless steel and attached to the building slab.

F. Vertical Conductor Supports: Install simultaneously with installation of conductors.

G. Miscellaneous Supports: Support miscellaneous electrical components as required to produce the same structural safety factors as specified for raceway supports. Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices.

H. In open overhead spaces, cast boxes threaded to raceways need not be supported separately except where used for fixture support; support sheet metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on opposite sides of the box and support the raceway with an approved type of fastener not more than 24 inches from the box.

I. Sleeves: Install in concrete slabs and walls and all other fire-rated floors and walls for raceways and cable installations. For sleeves through fire-rated wall or floor construction, apply UL-listed firestopping sealant in gaps between sleeves and

enclosed conduits and cables in accordance with requirements of Division 7 Section "Joint Sealants."

J. Conduit Seals: Install seals for conduit penetrations of slabs on grade and exterior wails below grade and where indicated. Tighten sleeve seal screws until sealing grommets have expanded to form watertight seal.

K. Fastening: Unless otherwise indicated, fasten electrical items and their supporting hardware securely to the building structure, including but not limited to conduits, raceways, cables, cable trays, busways, cabinets, panelboards, transformers, boxes, disconnect switches, and control components in accordance with the following:
   1. Fasten by means of wood screws or screw-type nails on wood, toggle bolts on hollow masonry units, concrete inserts or expansion bolts on concrete or solid masonry, and machine screws, welded threaded studs, or spring-tension clamps on steel. Threaded studs driven by a powder charge and provided with lock washers and nuts may be used instead of expansion bolts and machine or wood screws. Do not weld conduit, pipe straps, or items other than threaded studs to steel structures. In partitions of light steel construction, use sheet metal screws.
   2. Holes cut to depth of more than 1-1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete shall not cut the main reinforcing bars. Fill holes that are not used.
   3. Ensure that the load applied to any fastener does not exceed 25 percent of the proof test load. Use vibration- and shock-resistant fasteners for attachments to concrete slabs.

L. Test pull-out resistance of one of each type, size, and anchorage material for the following fastener types:
   1. Expansion anchors.
   2. Toggle bolts.
   3. Powder-driven threaded studs.
   4. E-Z type anchors.

M. Provide all jacks, jigs, fixtures, and calibrated indicating scales required for reliable testing. Obtain the Architects's approval before transmitting loads to the structure. Test to 90 percent of rated proof load for fastener. If fastening fails test, revise all similar fastener installations and retest until satisfactory results are achieved.

END OF SECTION

SECTION 26 0533
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes raceways and various types of electrical boxes, tubs, and enclosures for electrical wiring.

1.2 SUBMITTALS

A. Product data for conduit, surface raceways, and floor boxes.

B. Shop drawing for the installation of conduit in and under the slab.

1.3 QUALITY ASSURANCE

A. Comply with NEC for components and installation. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

B. The Terms "Listed" and "Labeled" as defined by the NEC, Article 100.

C. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined by OSHA Regulation 1910.7.

D. Comply with NECA "Standard of Installation."

E. Coordinate layout and installation of raceway with other construction elements to ensure adequate headroom, working clearance, and access.

F. Comply with UL 50, UL 514, and UL 886. Provide electrical boxes and fittings which are UL listed for that use.

PART 2 - PRODUCTS

2.1 CONDUITS AND TUBING

A. TYPES

1. Rigid Steel Conduit (RSC): Rigid steel conduit shall be heavy wall, hot-dipped galvanized or electro-galvanized. Conduit shall be in standard 10 foot lengths, threaded on both ends. Each length shall bear an UL label showing the manufacturer's name and/or trade mark. The label shall also designate the primary protective coating. The conduit shall have the inside and outside surfaces of each length thoroughly protected against corrosion by an even coating of zinc. Zinc coating of the finished shall have an even, smooth appearance and be of uniform quality for the entire length. The zinc coating shall be protected by a coating of acid and alkali-resisting lacquer on the inside and outside of each length. Rigid steel conduit shall comply with ANSI C80.1 and UL 6. Minimum size of 3/4".

2. Intermediate Metal Conduit (IMC): Except for the wall thickness, the intermediate metal conduit shall comply with the requirements of Rigid Steel Conduit. Intermediate metal conduit shall comply with ANSI 80.6 and UL 1242. Minimum size of 3/4".
3. Electrical Metallic Tubing (EMT): Electrical metallic tubing shall be zinc coated steel tubing. The inside surface shall be coated with zinc or enamel. The coating on the inside and outside shall have an even and smooth appearance and be of uniform quality for the entire length. The tubing shall be in standard 10 foot lengths. Each length shall bear an UL label showing the manufacturer's name and/or trade mark. The label shall also designate the primary protective coating. Electrical metallic tubing shall comply with ANSI C80.3 and UL 797. Minimum size of 3/4".
4. Rigid Nonmetallic Conduit: Rigid nonmetallic conduit shall be schedule 40 or 80 polyvinyl chloride (PVC) rated for use with 90 degree C conductors and sunlight resistant. The conduit shall be in standard 10 foot lengths. Each length shall bear an UL label showing the manufacturer's name and/or trade mark. Rigid nonmetallic conduit shall comply with UL 651. Minimum size of 3/4".
5. Flexible Steel Conduit: Flexible steel conduit shall be continuous length of spirally wound, interlocked zinc-coated strip steel. Flexible steel conduit shall comply with UL 1. Install separate ground conductor across flexible connections. Minimum size of 1/2".
6. Liquid-tight Flexible Steel Conduit: Liquid-tight flexible steel conduit shall be continuous length of spirally wound, interlocked zinc-coated strip steel coated with flexible polyvinyl chloride. Liquid-tight flexible steel conduit shall comply with UL 360. Install separate ground conductor across flexible connections. Minimum size of 1/2".
7. Aluminum Conduit: Shall be rigid and in standard 10 foot lengths, threaded on both ends. Each shall bear an UL label showing the manufacturer's name and/or trade mark. Aluminum conduit shall comply with UL 6A and ANSI C80.5. Minimum size of 3/4".
8. MC Cable: See Section 26 05 19 for requirements.
9. High-Density Polyethylene (HDPE) Conduit: Schedule 80 only, Meet requirements of NEMA Pub. No. TC 7-2000 for EPEC-80-HDPE and UL 651B and be UL listed for intended use. Minimum size of 3/4".

2.2 BOXES

A. DEVICE BOXES AND ACCESSORIES
1. Provide galvanized coated flat-rolled sheet-steel non-gangable device boxes, (2 1/8" deep minimum) of shapes, cubic inch capacities, and sizes, suitable for installation at respective locations.
2. Construct device boxes for flush mounting with mounting holes, and with cable-size knockout openings in bottom and ends, and with threaded screw holes in end plates for fastening devices.
3. Provide cable clamps and corrosion-resistant screws for fastening cable clamps, and for equipment type grounding.
4. Provide device box accessories as required for each installation, including mounting brackets, device box extensions, switch box supports, plaster ears, and plaster board expandable grip fasteners, which are compatible with device

boxes being utilized to fulfill installation requirements for individual wiring situations.

5. Use appropriate box brackets and support to minimize box movement into wall.
6. Use wet location while in use covers for receptacles, where appropriate.

B. FLOOR BOXES
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Wiremold
   b. Hubbell
   c. Thomas & Betts
2. Standards
   a. Comply with UL 514A
   b. Comply with NEC 300.21
3. Construction
   a. Shall be stamped steel and approved for use on above grade floors.
   b. Shall be fully adjustable, providing a maximum of 2" pre-pour adjustment and a maximum of 1" after-pour adjustment.
   c. Provide device mounting plates that accept devices shown on plan.
   d. Provide wiring devices and telecommunication outlets as shown on drawings. See Divisions 26 27 26 and 27 00 00 for wiring devices.
   e. Provide flangeless, die-cast aluminum activation covers with a black powder-coated paint finish.
4. Installation
   a. The minimum concrete pour depth shall be 3 7/16" plus 1/16" above the top of the box.
   b. The box shall contain four locations to accommodate leveling for pre-concrete pour adjustment and shall provide four leveling screws for the pre-pour adjustment

C. RAINTIGHT OUTLET BOXES
1. Provide corrosion-resistant cast-metal raintight outlet wiring boxes with threaded conduit holes for fastening electrical conduit, cast-metal face plates with spring-hinged watertight caps suitably configured for each application, including face plate gaskets and corrosion-resistant plugs and fasteners.

D. PANELBOARD TUBS
1. Tubs shall be provided by the panelboard manufacturer.

E. JUNCTION AND PULL BOXES
1. Provide galvanized code-gage sheet steel junction and pull boxes, with screw-on covers, welded seams and equipped with plated steel nuts, screws, and washers.
2. Provide junction and pull boxes where required to facilitate pulling of wire whether specified or not on drawings.
3. Maximum of 359 degrees of total turning radius shall be allowed between two pull points.

F. BUSHINGS, KNOCKOUT CLOSURES AND LOCKOUTS

1. Provide corrosion-resistant box knockout closures, conduit locknuts, and malleable iron conduit bushings, offset connectors, to suit respective installation requirements and applications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of the raceway system. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 RACEWAY APPLICATION

A. Rigid Steel or Intermediate Metal Conduit:
   1. Install rigid steel conduit or intermediate metal conduit for the following conditions:
      a. Outdoor installations exposed or on rooftop
      b. Indoor conduit over 4"diameter
      c. Conduit subject to water or physical damage, unless otherwise specified
      d. Installations in hazardous-classified areas
      e. RGS elbows shall be used where conduit below the slab turns up to go above the slab and shall be extended to a minimum of 3" above the slab.

B. Electrical Metallic Tubing (EMT):
   1. Install electrical metallic tubing for wiring less than 600 volts and in dry locations for the following conditions:
      a. Indoor branch circuits
      b. EMT may be installed exposed above suspended ceilings or in partitions.
      c. EMT shall not be used in concrete, direct burial, or in water softener areas or similar corrosive locations.
      d. Panelboard and mechanical equipment feeders

C. Rigid Nonmetallic Conduit:
   1. Install rigid nonmetallic conduit (PVC) for the following conditions:
      a. Underground branch circuits and feeders.
      b. Underground signal, control, and communication circuits.
      c. Conduit installed in slab or other flat concrete.
   2. When PVC is used at turn up above grade or above finished slab, only schedule 80 shall be used at the turn up location.

D. Liquid-Tight Flexible Steel Conduit:
   1. Install liquid-tight flexible steel conduit for the following conditions:
      a. Connections to equipment subject to vibration, movement, or noise transmission such as motors, transformers, generators, dimmer banks.
      b. Exterior equipment connections
   2. Maximum length is 6 feet.

E. Aluminum Conduit
   1. Conduit subject to chemical reactions causing corrosion.

F. MC Cable: See Section 26 0519 for uses.

G. High-Density Polyethylene (HDPE) Conduit
   1. Install HDPE conduit for the following conditions
      a. All conduit requiring boring for installation
      b. Conduits between telecommunication hand holes and telecommunication man holes.

3.3 INSTALLATION

A. Installation of electrical boxes, tubs and enclosures shall be coordinated with other trades.

B. All branch circuits shall be routed in conduit, at a minimum, to within 15' of the first device the circuit serves before transitioning to multi-conductor cable.

C. Conceal all conduit within finished walls, ceilings, and floors unless otherwise noted.

D. Conduits shall not be encapsulated by fire proofing or any other material.

E. Provide labels and identification per NEC requirements and 26 05 53.

F. Additional expense incurred by the Contractor as a result of ill timed work will be born by the Contractor, at no additional charge to the Owner.

G. Install all electrical raceways and factory assemblies in accordance with manufacturer's written installation instructions, applicable requirements of NEC.

H. Complete installation of electrical raceways before starting installation of conductors within raceways.

I. Use approved conduit hangers and support conduit in a neat and orderly manner regardless of location.

J. Die cast conduit couplings and connectors are prohibited.

K. Keep raceways at least 6 inches away from parallel runs of flues or hot water pipes.

L. Install raceways level and square and at proper elevations.

M. Where possible, install horizontal raceway runs above water piping.

N. Prevent foreign matter from entering raceways by using temporary closure protection.

O. Make bends and offsets so the inside diameter is not effectively reduced. Keep the legs of a bend in the same plane and the straight legs of offsets parallel.

P. Run concealed raceways with a minimum of bends in the shortest practical distance considering the type of building construction and obstructions.

Q. When conduit extends below the bottom of a slab on the ground, the slab shall be thickened in the area of the conduit so as to encase the conduit in concrete by at least 2 inches on all sides.

R. Where high voltage conduit or fiber duct is laid beneath the floor slab of a building, there shall be a minimum of 6 inches of sand fill between the outside of the concrete envelope around the conduit and the underside of the floor slab.

S. RGS elbows shall be used where conduit below the slab turns up to go above the slab and shall be extended to a minimum of 3" above the slab.

T. Protect stub-ups from damage where conduits rise from floor slabs. Arrange so curved portion of bends is not visible above the finished slab.

U. Raceways embedded in slabs: Install in middle third of the slab thickness where practical and leave at least 1 inch concrete cover. Tie raceways to reinforcing rods or otherwise secure them to prevent sagging or shifting during concrete placement. Place raceways laterally to prevent voids in concrete. Run conduit larger than one inch parallel with or at right angles to the main reinforcement; where at right angles to the reinforcement, the conduit shall be close to one of the supports of the slab.

V. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment with an adjustable top or coupling threaded inside for plugs and set flush with the finished floor. Extend conductors to equipment with rigid steel conduit; flexible metal conduit may be used 6 inches above the floor where equipment connections are not to be made under this contract, install screwdriver-operated threaded flush plugs flush with floor.

W. Exposed raceways: Install parallel and perpendicular to nearby surfaces or structural members and follow the surface contours as much as practical.

X. Run exposed, parallel, or banked runs from the same centerline so that the bends are parallel. Factory elbows may be used in banked runs only where they can be installed parallel. This requires that there be a change in the plane of the run such as from wall to ceiling and that the raceways be of the same size. In other cases provide field bends for parallel raceways.

Y. Join raceways with fittings designed and approved for the purpose and make joints wrench tight. Where joints cannot be made tight, use bonding jumpers to provide electrical continuity of the raceway system. Make raceway terminations tight. Where terminations are subject to vibration, use bonding bushings or wedges to assure electrical continuity. Where subject to vibration or dampness, use insulating bushings to protect conductors.

Z. Where raceways are terminated with locknuts and bushings, align the raceway to enter squarely and install the locknuts with dished part against the box. Where terminations cannot be made secure with one locknut, use two locknuts, one inside and one outside the box. Bushings on all conduit 1 inch and larger shall be insulating type.

AA. Where terminating in threaded hubs, screw the raceway or fitting tight into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align the raceway so the coupling is square to the box, and tighten the chase nipple so no threads are exposed.

BB. Expansion fittings shall be used in all conduit runs crossing expansion joints, where required by NEC, or manufacturers recommendations.

CC. Install raceway sealing fittings in accordance with the manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following locations:
1. Where conduits enter or leave hazardous locations.
2. Where conduits pass from warm locations to cold locations, such as the boundaries of refrigerated spaces and air conditioned spaces.
3. Where required by NEC.

DD. Install pull wires in all empty raceways. Use monofilament plastic line having not less than 100 lb tensile strength. Leave not less than 12 inches of slack at each end of the pull wire.

EE. Seal spare and empty conduits with a conduit cap or plug to which the pull wire is attached.

FF. Conduit fill: Do not exceed 30 percent conductor fill in conduits, containing branch circuit conductors. Do not exceed NEC requirements for all other conduits.

GG. Conductor derating: Derate conductor ampacity in accordance with NEC raceway fill requirements. Do not fill raceways so that conductor derating will exceed 50 percent.

HH. Provide boxes flush mounted in walls for switches, receptacles, telecommunications outlets, and manual motor starters.

II. Provide rain-tight outlet boxes for interior and exterior locations exposed to weather or moisture.

JJ. Install all boxes level and square.

KK. Install switch boxes six inches from latch side of door openings.

LL. Do not install aluminum products in concrete.

MM. Do not install boxes back-to-back or use through-the-wall boxes.

NN. Set floor boxes level and flush with finished flooring material.

OO. Fasten electrical boxes firmly and rigidly to substrates, or structural surfaces to which attached, or solidly embed boxes in concrete or masonry. Support boxes independently of conduit system.

PP. Install cover plates and plug unused openings in boxes, raceways, cabinets, and equipment cases to afford protection equivalent to the wall of the equipment.

END OF SECTION

SECTION 26 0553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section consists of providing labor, materials, tools, appliances and miscellaneous accessories associated with electrical identification as indicated herein and on the Drawings.

B. Types of electrical identification specified in this section include the following:
   1. Exposed conduit color banding
   2. Cable/Conductor identification
   3. Operational instructions and warnings
   4. Danger signs
   5. Equipment/system identification signs
   6. required identification

1.2 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and ANSI C2.

B. Comply with NEC.

PART 2 - PRODUCTS

2.1 ELECTRICAL IDENTIFICATION MATERIALS

A. General: Except as otherwise indicated, provide manufacturer's standard products of categories and types required for each application. Where more than one type is specified for an application, selection is Installer's option, but provide single selection for each application.

B. Provide identification and signage for all emergency systems, services, and other systems as required per NEC.

C. Cable/Conductor Identification Bands: General: Provide manufacturer's standard vinyl-cloth self-adhesive cable/conductor wire markers or wrap-around type, either pre-numbered plastic coated type, or write on type with clear plastic self-adhesive cover flap, numbered to show circuit identification.

D. Self-adhesive Plastic Signs: Provide manufacturer's standard, self-adhesive or pressure-sensitive, pre-printed, flexible vinyl signs for operational instructions or warnings, of sizes suitable for application areas and adequate for visibility, with proper wording for each application (as examples: "208V", "EXHAUST FAN", "RECTIFIER"). Unless otherwise indicated or required by governing regulations, provide orange signs with black lettering.

E. Danger Signs: Provide Manufacturer's standard "DANGER" signs of baked enamel finish on 20-gage steel, of standard red, black and white graphics, 14" x 10" size except where 10" x 7" is the largest size which can be applied where needed and except where larger size is needed for adequate vision, and with recognized standard explanation wording (as examples: "HIGH VOLTAGE", "KEEP AWAY", "BURIED CABLE", "DO NOT TOUCH SWITCH").

F. Engraved Plastic-Laminate Signs: Provide engraved stock melamine plastic-laminate, complying with FS L-P-387, in sizes and thicknesses indicated, engraved with engraver's standard letter style of sizes and wording indicated, black and white core (letter color) except as otherwise indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate.
   1. Thickness: 1/16", for units up to 20 sq. in. or 8" length, 1/8" for larger units.
   2. Fasteners: Self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate substrate.

2.2 LETTERING AND GRAPHICS

A. Coordinate names, abbreviations and other designations used in electrical identification work, with corresponding designations shown, specified for scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of electrical system and equipment.

PART 3 - EXECUTION

3.1 APPLICATION AND INSTALLATION

A. General Installation Requirements:
   1. Coordination: Where identification to be applied to surfaces which require finish, install identification after completion of painting.
   2. Regulations: Comply with governing regulations and requests of governing authorities for identification of electrical work.

B. Conduit Identification: Where electrical conduit is exposed in spaces with exposed mechanical piping which is identified by a color-coded method, apply color-coded identification on electrical conduit in a manner similar to piping identification. Except as otherwise indicated, use orange as coded color for conduit.

C. Cable/Conductor Identification:
   1. Apply cable/conductor identification on each box/enclosure/cabinet where wires are present, Match identification with marking system used in panelboards, shop drawings, contract documents, and similar previously established identification for project electrical work.
   2. Conductors shall be clearly and permanently identified.
   3. All control circuit and instrument circuit terminations shall be identified. For conductors #6 and smaller, conductor color coding shall be color insulation.

For conductor color coding of wire larger than #6, use self-adhesive wrap around tape markers. Use markers at all panelboards, boxes, outlets, switches, circuit breakers and control centers.

4. All ground conductors and these only: Green.
5. 208Y/120V: Phase Conductors: Black, red, blue. Neutral Conductor: White
6. 480y/277V: Phase conductors: Yellow, Orange, Brown Neutral, Conductor: Gray

D. Operational Instructions and Warnings: Wherever reasonably required to ensure safe and efficient operation and maintenance of electrical systems, and electrically connected mechanical systems and general systems and equipment, including prevention of misuse of electrical facilities by unauthorized personnel, install self-adhesive plastic signs or similar equivalent identification, instruction or warnings on switches, outlets and other controls devices and covers of electrical enclosures. Where detailed instructions or explanations are needed, provide plasticized tags with clearly written messages adequate for intended purposes.

E. Equipment/System Identification:
1. Install engraved plastic-laminate sign on each major unit of electrical equipment in building unless unit is specified with its own self-explanatory identification. Except as otherwise indicated, provide single line of text, 1/2" high lettering on 1-1/2" high sign (2" high where 2 lines are required), white lettering in black field.
2. Provide text matching terminology and numbering of the contract documents and shop drawings. Provide signs for the following categories of electrical work:
   a. Panelboards, electrical cabinets and enclosures
   b. Access panel/doors to electrical facilities
   c. Major electrical switchboard
   d. Disconnect Switches
   e. Transformers
   f. Telephone switching equipment
   g. Fire alarm master station
3. For all service equipment, provide nameplate stating available fault current at equipment. Verify available fault current with Architect.
4. Provide identification for all emergency system equipment, service equipment, and other systems per NEC requirements.
5. Install signs at locations indicated or, where not otherwise indicated, at location for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with fasteners, except use adhesive where fasteners should not or cannot penetrate the substrate.

END OF SECTION

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SECTION 26 0923
LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Extent of lighting control equipment work is indicated by drawings and schedules, and is hereby defined to include, but not by way of limitation, photocells, lighting contactors, and time switches.

1.2 SUBMITTALS

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

B. Maintenance Manuals: Furnish maintenance manuals which contain equipment cuts, operating instructions, troubleshooting procedures and spare parts list for equipment. Ensure manual includes operating instructions.

1.3 QUALITY ASSURANCE

A. Installer's Qualifications: Firm with at least 5 years of successful installation experience on projects with lighting control equipment work similar to that required for this project.

B. Codes and Standards:
   1. Electrical Code Compliance: Comply with applicable local electrical code requirements of the authority having jurisdiction and NEC as applicable to construction, installation of lighting control and communications equipment.
   2. UL Compliance: Comply with applicable requirements of UL Std 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors". Provide lighting control equipment and components which are UL-listed and labeled.
   3. NEMA Compliance: Comply with applicable requirements of NEMA's Stds Pub No. 250, "Enclosures for Electrical Equipment (1000-Volts Maximum)."

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver lighting control equipment and components in factory-fabricated type contains or wrappings, which properly protect equipment from damage.

B. Store lighting control equipment in original packaging and protect from weather and construction traffic. Wherever possible, store indoors; where necessary to store outdoors, store above grade and enclose with watertight wrapping.

C. Handle lighting control equipment carefully to prevent physical damage to equipment and components. Do not install damaged equipment; remove from site and replace damaged equipment with new.

1.5 WARRANTY

A. Special Warranty for sensors, digital time switches, and power packs: Manufacturer's standard form in which manufacturer of agrees to repair or replace components that fail in materials or workmanship within specified warranty period.
   1. Warranty Period for Sensors, Digital Time Switches, and Power Packs: 3 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Dimming Control, Occupancy Sensors, Digital Time Switches, & Interior Photosensors
      a. Watt-Stopper
      b. Lutron
      c. Leviton
      d. Sensor Switch
      e. Douglas

2.2 DIGITAL TIME SWITCH

1. Wattstopper TS-400 or equivalent
2. Wall mounted and shall be programmable to turn lights off after a preset time
3. The unit shall fit in or on a standard single gang switch box and require only two wires and a grounded box for operation.
4. Electroluminescent backlit Liquid Crystal Display that shows the timer's countdown.
5. Time scroll feature shall allow manual overriding of the preset time-out period. Selecting time scroll UP shall allow time-out period to scroll up throughout the timer possibilities to the maximum. Time scroll DN (down) shall allow time-out period to scroll down to minimum.
6. The unit shall have the option for a one second light flash warning at five minutes before the timer runs out and twice when the countdown reaches one minute.
7. The unit shall have the option for a beep warning that shall sound every five seconds once the time switch countdown reaches one minute.
8. The unit shall have manual feature for timer reset where pressing the ON/OFF switch for more than 2 seconds resets the timer to the programmed time-out period.
9. Decorator style faceplate.
10. Time-out period shall be adjustable in increments of 5 minutes from 5 minutes to 1 hour, and in increments of 15 minutes from 1 hour to 12 hours.
11. The unit shall be UL listed for intended use.

2.3 OCCUPANCY SENSORS

A. Wall Mounted
   1. The unit shall fit in or on a standard single gang switch box and require only two wires and a grounded box for operation.

2. Sensitivity shall be adjustable.
3. The delay timer shall be adjustable with a range of 5 to 30 minutes minimum.
4. The off switch shall have manual override for positive off and positive on.
5. The test LED shall indicate motion.
6. The unit shall be UL listed for intended use.
7. See schedule for more information.

B. Ceiling Mounted
1. The unit shall fit in or on a standard octagon box.
2. The sensitivity shall be adjustable
3. The delay timer shall be adjustable 5 to 30 minutes minimum range.
4. The sensor shall have provisions, such as masking, to block out problem areas.
5. Test LED to indicate motion.
6. The unit shall be UL listed for intended use.
7. See schedule for more information.

2.4 POWER PACKS AND SLAVE PACKS

A. Provide as required per the sensor manufacturer's recommendations to operate the lighting control zones as described.

B. Universal input voltage

C. Self contained power supply and relay module

D. Dry contacts capable of switching 20-amp ballast and incandescent loads and circuited voltage.

E. LED indicator status of relay

F. Over-current protection for low voltage output.

G. UL 2043 plenum rated

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which lighting control equipment is to be installed and notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 INSTALLATION

A. Install lighting control system components and ancillary equipment as indicated, in accordance with equipment manufacturer's written instructions, and with recognized industry practices, to ensure that lighting control equipment complies with requirements. Comply with requirements of NEC, and applicable portions of NECA's Standard of Installation" pertaining to general electrical installation practices.

B. Furnish and install all required low voltage cabling to interconnect lighting control devices and control panels.

C. Program all sensors, wall stations, and dimming control systems.

D. Coordinate with other electrical work, including raceways, and electrical boxes and fittings, as necessary to interface installation of lighting control equipment work with other work.

E. Tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Stds 486A and B.

F. Contractor shall provide sensor adjustment and relocation and system reprogramming per Owner's request after 6 months of substantial completion being awarded.

3.3 FIELD QUALITY CONTROL

A. Upon completion of installation and after circuitry has been energized, demonstrate capability and compliance of system with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting. Testing and retesting at no cost to Owner.

3.4 DEMONSTRATION

A. Building Operating Personnel Training: Train Owner's building personnel in procedures for starting-up, testing and operating lighting control system equipment. Provide at least 1 hour of training.

END OF SECTION

SECTION 26 2726
WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this section consists of providing labor, materials, tools, appliances and miscellaneous accessories for wiring device work indicated by Drawings and schedules. Wiring devices are defined as single discrete units of electrical distribution systems which are intended to carry but not utilize electric energy.

1.2 SUBMITTALS

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

B. Maintenance Manuals: Furnish maintenance manuals which contain equipment cuts, operating instructions, troubleshooting procedures and spare parts list for equipment. Ensure manual includes operating instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Subject to compliance with requirements, manufacturers offering devices which may be incorporated in the work include, but are not limited to the following:
   1. Bryant Electric Co.
   2. Harvey Hubbell, Inc.
   3. Pass and Seymour, Inc.
   4. Leviton Co.
   5. Wiremold Company

2.2 FABRICATED WIRING DEVICES

A. General: Provide factory-fabricated wiring devices, in types, colors, and electrical ratings for applications indicated and complying with NEMA Stds. Pub. No. WD 1. Where types and grades are not indicated, provide proper selection as determined by Installer to fulfill wiring requirements, and color devices and wallplates except as otherwise selected.

B. Receptacles:
   1. Duplex: Provide duplex "specification grade" receptacles, 2-pole, 3-wire grounding, with green hexagonal equipment ground screw, ground terminals and poles internally connected to mounting yoke and mounting yoke provided with automatic grounding feature between mounting screws and yoke, 20-amperes, 125-volts, with metal plaster ears, back and side wiring, NEMA

configuration 5-20R unless otherwise indicated. Pass & Seymour 5362 series (see below for color).

2. Simplex: Provide simplex "specification grade" receptacles, 2-pole, 3-wire grounding, with green hexagonal equipment ground screw, ground terminals and poles internally connected to mounting yoke and mounting yoke provided with automatic grounding feature between mounting screws and yoke, 20-amperes, 125 volts, with metal plate ears, (back and) side wiring, NEMA configuration 5-20R unless otherwise indicated. Pass & Seymour 5361 series (see below for color).
3. Ground-Fault Interrupter: Provide "specification grade" duplex receptacles, ground-fault circuit interrupters (GFCI), feed-thru type, capable of protecting connected downstream receptacles on single-circuit, grounding type UL-rated Class A, 20-amperes rating, 120-volts, 60 Hz, with solid-state ground-fault sensing and signaling, with 5 milliamperes ground-fault trip level; equip with 20-ampere plug configuration, NEMA 5-20R with local test/reset buttons and LED signal light to signify power is available. Pass & Seymour 2095 series (see below for color).

C. Plugs and Connectors: Refer to drawings.

D. Switches
1. Single Pole Toggle
   a. "Specification grade" flush, quiet, AC-type, single-pole toggle switches
   b. 20-amperes, 277/125 volts AC, with mounting yoke insulated from mechanism
   c. Plaster ears, switch handle, side-wired screw terminals (and backwiring with clamp type terminals).
   d. Pass & Seymour PS20AC1 series (see below for color).
2. Double-Pole Toggle
   a. "Specification grade" flush, quiet, AC type, double-pole toggle switches
   b. 20-amperes, 277/125 volts AC, with mounting yoke insulated from mechanism
   c. Plaster ears, switch handle, side-wired screw terminals (and backwiring with clamp type terminals) and ground screw.
   d. Pass & Seymour PS20AC2 series (see below for color).
3. Three-Way Toggle
   a. "Specification grade" flush, quiet, AC-type, three-way toggle switches
   b. 20-amperes, 277/125 volts AC, with mounting yoke insulated from mechanism
   c. Plaster ears, switch handle, side-wired screw terminals (and backwiring with clamp type terminals).
   d. Pass & Seymour series PS20AC3 (see below for color).
4. Four-Way Toggle
   a. "Specification grade" flush, quiet, AC-type, four-way toggle switches

b. 20-amperes, 277/125 volts AC, with mounting yoke insulated from mechanism
c. Plaster ears, switch handle, side-wired screw terminals (and backwiring with clamp type terminals)
d. Pass & Seymour PS20AC4 series (see below for color).

2.3 DIMMERS

A. Controls
1. Dimmers shall provide full-range, continuously variable control of light intensity.
2. Controls shall fit a 1 inch wide, 1.5 inch tall wallplate opening with a vertical linear-slide. Controls shall be thin profile with no exposed heatsink/yoke. Unless otherwise specified, controls shall have a matte finish.
3. Controls shall provide a vertical slider allowing the light level or fan speed to be set by the user. "Slide-to-off" controls shall use the vertical slider to turn the control on and off.
4. "Preset" dimmers shall provide the on/off function independent of the dimmer slider position. This preset function shall be provided as a push on/push off switch integral to the slider knob and visibly distinct from the slider. For preset dimmers, when the lights are on, the slider shall change the light level and when the lights are off, the slider shall preselect the light level the lights will turn on to.
5. Control on/off function must be accomplished utilizing a mechanical air-gap switch to totally disconnect power from the load during "off" condition, no leakage current shall be present at the fixture(s).
6. Controls shall be able to have their visible plastic parts replaced, for color changes in the field, without removing the body of the control from the wall and without requiring special tools.
7. Within rated capacity, dimmers shall be available for direct control of incandescent, electronic low voltage, magnetic low voltage, and fluorescent. Matching fan-speed controls and switches shall also be available.
8. Controls shall be capable of operating at the rated capacity; this includes modified capacities for ganging configurations which require the removal of fins. Operation at rated capacity shall be possible across the full ambient temperature range, without shortening design lifetime.
9. Dimmer shall provide smooth and continuous Square Law dimming curve, for the full slider travel, on their rated load per The IESNA Lighting Handbook
10. Controls shall meet the applicable requirements of UL 20 and UL 1472 referring to the inclusion of a visible, accessible air-gap off switch and the limited short circuit test.
11. Dimmers shall be designed to reduce interference with radio, audio, and video equipment.

12. Controls shall incorporate power-failure memory. Should power be interrupted and subsequently returned, the lights or fans will come back on to the same levels set prior to the power interruption. Restoration to some other default level is not acceptable.
13. Dimmer shall include voltage compensation to compensate light output for variation in the AC line-voltage. Dimmers in which the light output is not held constant with varying AC line-voltage shall not be acceptable.

B. Incandescent Dimmers
1. Provide incandescent dimmers for direct control of up to a full 20A lighting circuit, which is derated by 20% to 16 Amps per the NEC.
2. Dimmers shall have a high-end of no less than 95% of line voltage.
3. Dimmer shall be capable of operating in either 3-way switch location.

C. Electronic (Solid-State) Low Voltage (ELV) Transformer Dimmers
1. Dimmers shall contain circuitry specifically designed to control the input of electronic (solid state) low voltage transformers. Dimmers using standard phase control shall not be acceptable.
2. Provide ELV dimmers for direct control of up to 600 watts of electronic low voltage load.
3. Dimmers shall have a high-end of no less than 90% of line voltage.

D. Magnetic Low Voltage (MLV) Transformer Dimmers
1. Provide MLV dimmers for direct control of up to 1500VA of 120 volt magnetic low voltage load.
2. Provide MLV dimmers for direct control of up to 1000VA of 277 volt magnetic low voltage load.
3. Dimmers shall contain circuitry specifically designed to control and provide a symmetrical AC waveform to the input of magnetic low voltage transformers per UL1472 section 5.11.
4. Dimmers shall not cause a magnetic low voltage transformer to operate above the transformers rated operating current or temperature.
5. Dimmers shall have a high-end of no less than 95% of line voltage.

E. Fluorescent Dimming Ballast Dimmers
1. Provide Fluorescent dimmers for direct control of fluorescent dimming ballasts up to the manufacturers specified rating.
2. Dimmers shall be designed to provide full ballast output at high-end.

F. Remote dimming modules for high power loads
1. Where lighting loads exceed the full rated capacity of single dimmers, provide an incandescent dimmer driving high power modules.
2. High power modules shall be remotely mounted.

3. High power module shall be rated and UL listed for control of incandescent, magnetic low voltage, electronic low voltage, fluorescent, and neon/cold cathode loads.

2.4 WIRING DEVICE ACCESSORIES

A. Wall Plates: Provide wall plates for wiring devices, of types, sizes, and with ganging and cutouts as indicated on drawings (or schedules). Construct with metal screws with tamperproof heads for securing plates to devices, screw heads colored to match finish of plates. All aluminum plates shall be made of solid anodized aluminum (not painted aluminum). All plastic plates shall be high-impact, smooth nylon.

2.5 WIRING DEVICE FINISHES

A. Provide device material and finish for all locations according to the below list:
   1. Switches: Ivory
   2. Switch Cover Plates: Nylon, Ivory
   3. Receptacles: Ivory
   4. Receptacle Cover Plates: Nylon, Ivory
   5. Ground-Fault Interrupter: Ivory
   6. Ground-Fault Interrupter Plates: Nylon, Ivory
   7. Telephone Data Plates: Nylon, Ivory

PART 3 - EXECUTION

3.1 INSTALLATION OF WIRING DEVICES/PLATES

A. Install wiring devices as indicated, in compliance with manufacturer's written instructions, applicable requirements of NEC and NECA's "Standard of Installation", and in accordance with recognized industry practices to fulfill project requirements.

B. Coordinate with other work, including painting, electrical box and wiring work, as necessary to interface installation of wiring devices with other work, furniture locations, and door swings.

C. Verify location of all devices with Architect before beginning construction.

D. Install wiring devices only in electrical boxes which are clean, free from excess building materials, dirt, and debris.

E. Install galvanized steel wall plates in unfinished spaces.

F. Install weatherproof covers at all damp or exposed locations, as indicated on drawings.

G. Delay installation of wiring devices until wiring work is completed.

H. Delay installation of wall plates until after painting work is completed.

I. Protect wiring devices during painting.

J. Plates shall be installed with all four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings will not be permitted. Plates shall be installed with an alignment tolerance of 1/16" from the vertical or horizontal.

K. All 20 amp and 15 amp, 3-wire receptacles shall be mounted with a "u" shaped grounding connection at the top, except for weatherproof receptacles and major appliance receptacles.

L. Provide monolithic cover plate for all switches and dimmer switches adjacent to each other.

3.2 PROTECTION OF WALL PLATES AND RECEPTACLES

A. Upon installation of wall plates and receptacles, advise Contractor regarding proper and cautious use of convenience outlets. At time of Substantial Completion, replace those items which have been damaged, including those burned and scored by faulty plugs.

3.3 GROUNDING

A. Provide electrically continuous, tight grounding connections for wiring devices, unless otherwise indicated. Tighten connections to comply with tightening torques specified in UL standard 486A to assure permanent and effective grounds.

3.4 TESTING

A. Prior to energizing circuitry, test wiring devices for electrical continuity and proper polarity connections. After energizing circuitry, test wiring devices to demonstrate compliance with requirements.

B. Sensitivity Test: After the sensor has been energized for at least 15 minutes, walk to the middle of the room (if conference room) or sit at the normal desk position (if and office). Make no motion for 20 seconds. Move one arm up and down slowly.

C. Time Delay Test: Set the time delay for 10 minutes. Walk into the room to activate the sensor then leave room. Sensor must turn lights off at approximately 10 minutes. Walk into the room again to reactivate the lights. Lights should activate within 1 second.

3.5 ADJUSTING

A. Adjust devices and wall plates to be flush and level (within 1/16"). Mark all conductors with the panel and circuit number serving the device, at the device.

Mark the panel and circuit number serving the device on the backside of the device plate with a permanent marking system that does not show through the front of the plate.

3.6 MOUNTING HEIGHTS

A. Unless otherwise noted on the Drawings or required by the Architect, the following mounting heights shall apply:

Toggle switches	48" AFF	Vertical
Receptacles	18" AFF	Vertical
Over counter receptacles	6" Above Counter	Horizontal
Above back splashes	2" Above Splash Guard	Horizontal
Mechanical Room receptacles	18" AFF	Vertical
Receptacles above or adjacent to lavatories	42" AFF	Vertical
Telephone outlets for wall mounted telephones	48" AFF	Vertical
Data Outlets:	18" AFF	Vertical

B. Upon approval of the Architect mounting heights may be adjusted.

END OF SECTION

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SECTION 26 2813
FUSES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Fuses

B. Related Sections include the following:
   1. Section 26 28 16 - Enclosed Switches and Circuit Breakers

1.2 SUBMITTALS

A. Submit the following according to the Conditions of the Contract and Division 01 Specification Sections.

B. Product data for each fuse type. Include the following:

C. Descriptive data and time-current curves.
   1. Let-through current curves for fuses with current limiting characteristics.
   2. Coordination charts and tables and related data.

1.3 QUALITY ASSURANCE

A. Comply with NEC for components and installation.

B. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

C. The Terms "Listed" and "Labeled": As defined in the "National Electrical Code," Article 100.

D. Single-Source Responsibility: All fuses shall be the product of a single manufacturer.

1.4 EXTRA MATERIALS

A. Furnish the following extra materials that match products installed, packaged with protective covering for storage, and with identification labels clearly describing contents.
   1. Fuses: 1 for every 10 of each type and rating installed. Furnish at least 1 of each type and rating.

PART 2 - PRODUCTS

2.1 CARTRIDGE FUSES

A. All fuses: 200,000 AIC at rated AC or DC voltage.

B. Fuses 1/10 through 600 A
   1. UL Class: RK- 1, time delay
   2. Maximum operating temperature: 300 deg. F
   3. Self protecting thermally
   4. Separate overload and short circuit element
   5. Incorporate a spring-activated "snap-trigger" thermal overload element responsive to fuse temperatures exceeding 284 deg. F

C. Fuses 601 to 6,000 A
   1. UL Class: L, time delay
   2. Pure silver links
   3. "O" ring seal
   4. 600V or less AC
   5. 250V or less DC

2.2 CONTROL CIRCUIT FUSES

A. UL Class CC

B. Dual element, time delay

2.3 PLUG FUSES

A. Type: UL 198F, Type S, dual element, time delay

B. Edison base fuses shall not be used

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fuses in fusible devices as indicated. Arrange fuses so that fuse ratings are readable without removing fuse.

END OF SECTION

SECTION 26 2816
ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Feeder and equipment disconnects
   2. Enclosed circuit breakers

B. Related Sections include the following:
   1. Section 26 28 13 - Fuses

1.2 SUBMITTALS

A. Product data for switches, circuit breakers, and accessories specified in this Section.

B. Descriptive data and time-current curves for protective devices and let-through current curves for those devices with current-limiting characteristics. Include coordination charts and tables, and related data.

1.3 QUALITY ASSURANCE

A. Comply with NEC for components and installation.

B. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

C. The Terms "Listed" and "Labeled": As defined in the "National Electrical Code," Article 100.

D. Single-Source Responsibility: All enclosed switches and circuit breakers shall be the product of a single manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Square D
   2. Eaton
   3. GE
   4. Siemens

2.2 MATERIALS

A. ENCLOSED SWITCHES

1. Enclosed Non-fusible Switch: NEMA KS 1, Type HD, handle lockable with 2 padlocks.
2. Enclosed Fusible Switch, 800 Amperes and Smaller: NEMA KS 1, Type HD, clips to accommodate specified fuses, enclosure consistent with environment where located, handle lockable with 2 padlocks, and interlocked with cover in CLOSED position.
3. Switches serving fire pumps: Shall be lockable in closed position.
4. Enclosure: See plan.

B. **ENCLOSED CIRCUIT BREAKERS**

1. Enclosed Molded-Case Circuit Breaker: NEMA AB 1, handle lockable with 2 padlocks.
2. Characteristics: Frame size, trip rating, number of poles, and auxiliary devices as indicated; interrupting capacity rating to meet available fault current, 35,000 symmetrical RMS amperes minimum. With appropriate application listing when used for switching fluorescent lighting loads or heating, air conditioning, and refrigeration equipment.
3. Interchangeable Trips: Circuit breakers, 200 amperes and larger, with trip units interchangeable within frame size.
4. Lugs: Mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated.
5. Shunt Trip: Where indicated, 120 volts, 60 Hz.
6. Enclosure: See plan

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install enclosed switches and circuit breakers in locations as indicated, according to manufacturer's written instructions.

B. Install enclosed switches and circuit breakers level and plumb.

C. Install wiring between enclosed switches and circuit breakers and control and indication devices.

D. Disconnects shall be mounted at 6'-6" AFF to top of enclosure in accessible areas, unless otherwise indicated.

E. Fusible disconnects shall not be mounted over 12 feet AFF. Unless otherwise indicated.

F. Disconnects mounted on equipment higher than 12 feet AFF, shall be non-fused. Fusing protection must be provided in a more readily accessible location.

G. All motors shall have a disconnecting means with in sight of, and not more than 20 feet from motor.

H. Provide a "Lock-Out" means at disconnect for all motors, at disconnect nearest motor or equipment.

I. Connect enclosed switches and circuit breakers and components to wiring system and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts according to equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals according to tightening torques specified in UL Standard 486A.

3.2 FIELD QUALITY CONTROL

A. Testing: After installing enclosed switches and circuit breakers and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

B. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA Standard ATS, Section 7.5 for enclosed switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.

C. Verify all interlock devices (mechanical and electrical) are in place and working correctly.

D. Correct malfunctioning units at site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units, and retest.

3.3 CLEANING

A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

3.4 DEMONSTRATION

A. Review data in the "Operating and Maintenance Manual." Refer to Division 01 Section "Closeout Procedures."

END OF SECTION

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SECTION 26 5000
LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Extent, location, and details of interior lighting fixture work are indicated on drawings and in schedules.

1.2 PRIOR APPROVALS

A. For prior approvals, submit all requirements specified in Section 1.3. To be considered an equal fixture, the fixture must meet all criteria specified on the fixture schedule.

B. Any proposed substitute must be submitted with proper documentation as noted in this specification along with a working sample at no charge at least 7 days prior to the bid date for approval.

1.3 SUBMITTALS

A. Product data shall be submitted as a paper copy, in booklet form, in alphanumeric order, by fixture type.

B. All submittals shall match exactly the style, design, and appearance of the fixtures specified in the fixture schedule and details of the drawings in order to be considered for substitution as an approved equal.

C. Product Data: Submit manufacturer's product data and installation instructions on each type interior building lighting fixture and component. Include data on features, accessories, finishes, warranty, and the following:
   1. Photometrics
      a. Coefficients of utilization
      b. Candlepower data presented graphically and numerically
      c. Zonal lumens
      d. Efficiency
   2. Materials and dimensions of luminaires and mounting accessories.
   3. Certified results of independent laboratory tests for fixtures and lamps for electrical ratings and photometric performance per IES LM-79-08 and LM-80-08.
   4. Luminaire ballasts, drivers, transformers, and other components necessary for operation.
   5. Photocell

D. Shop Drawings: Fixture shop drawings with ballast manufacturer information in booklet form with separate sheet for each fixture, assembled in "luminaire type" alphabetical or numerical order, with proposed fixture and accessories clearly indicated on each sheet. Submit details indicating compatibility with ceiling grid system. Submit locations of remote ballasts when specified.

E. Samples for Verification: For lighting units or luminaires designated for sample submission in the Fixture Schedule shown on the drawings or for fixtures being submitted for prior approval:
   1. Lamps or LED Modules: Specified units installed.
   2. Ballast or Driver: 120-V model of specified ballast or driver type.
   3. Finishes: For each finished metal used in support components.
   4. Product Certificates: Signed by manufacturers of lighting units certifying that products comply with requirements.
   5. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.
   6. Maintenance Data: For lighting units to include in maintenance manuals specified in Division 1.

F. Light fixture submittals requiring a resubmittal shall only have the light fixtures that were marked with comments be resubmitted. Light fixtures in previous submissions that were not marked with comments will not be rereviewed unless the Contractor states in writing why that light fixture was resubmitted (fixture has changed, etc).

1.4 QUALITY ASSURANCE

A. Installer's Qualifications: Firms with at least 3 years of successful installation experience on projects with interior lighting fixture work similar to that required for this project.

B. Codes and Standards
   1. Electrical Code Compliance: Comply with applicable local code requirements of the authority having jurisdiction and NEC Articles 220, 410, and 510 as applicable to installation, and construction of interior building lighting fixtures.
   2. NEMA Compliance: Comply with applicable requirements of NEMA LE 1 and LE 2 pertaining to lighting equipment.
   3. IES Compliance: Comply with IES RP-1 pertaining to office lighting practices and RP-15, regarding selection of illuminance values for interior office lighting.
   4. UL Compliance: Comply with UL standards, including UL 486A and B, pertaining to interior lighting fixtures. Provide interior lighting fixtures and components which are UL-listed and labeled.
   5. CBM Labels: Provide fluorescent lamp ballasts which comply with Certified Ballast Manufacturers Association standards and carry the CBM label.
   6. NSF Compliance: Provide fixtures compliant with NSF-2 where specified.
   7. IEC 60598: Provide IP ratings per IEC 60598-1 where specified.

C. Coordination of Fixtures with Ceiling and exposed structure areas: Coordinate fixtures mounting hardware and trim with the ceiling system.

D. Manufacturers Qualifications: Firms experienced in manufacturing fixtures that are similar to those indicated for this Project and that have a record of successful in-service performance.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver interior lighting fixtures in factory-fabricated containers or wrappings, which properly protect fixtures from damage.

B. Store interior lighting fixtures in original packaging. Store inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, laid flat and blocked off ground.

C. Handle interior lighting fixtures carefully to prevent damage, breaking, and scoring of finishes. Do not install damaged units or components; replace with new.

1.6 WARRANTY

A. Special Warranty for luminares and poles exhibiting a failure of finish as specified below.
   1. Protection of Metal from Corrosion: Warranty against perforation or erosion of finish due to weathering.
   2. Color Retention: Warranty against fading, staining, and chalking due to effects of weather and solar radiation
   3. Warranty Period: 5 years from date of Substantial Completion.

B. Special Warranty for Ballasts, Drivers, and Emergency Battery Packs: Manufacturer's standard form in which ballast manufacturer agrees to repair or replace ballasts that fail in materials or workmanship within specified warranty period.
   1. Warranty Period for Ballasts, Drivers, and Emergency Batter Packs: 5 years from date of Substantial Completion.

C. Special Warranty for LED modules: Manufacturer's standard form in which LED manufacturer agrees to repair or replace LED modules that fail in materials or workmanship within specified warranty period.
   1. Warranty Period for LED modules: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Certain items in this Specification are listed by manufacturer and/or manufacturer's model number to establish general style, type, character and quality of the product desired. Similar items manufactured by other than those listed will be considered, providing submittals are made according to Pre-Bid Approval requirements of Instructions to Bidders.

B. All lamps of the different types (fluorescent, LED, etc.) shall be by the same manufacturer.

C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work are listed on the lighting fixture schedule and the following:
   1. Light Fixtures: See fixture schedule
   2. Ballasts:
      a. Advance
      b. Universal
      c. Lutron
      d. General Electric

e. Osram Sylvania

3. LED Drivers:
   a. Advance/Philips
   b. General Electric
   c. National Semiconductor
   d. Osram Sylvania
4. Light Emitting Diodes:
   a. CREE
   b. General Electric
   c. Nichia
   d. Phillips Lumileds
   e. Osram Sylvania
5. Emergency Battery Packs
   a. Iota
   b. Bodine

2.2 FIXTURES

A. Comply with the requirements specified in the Articles below and lighting fixture schedule.

B. General: Provide lighting fixtures, of sizes, types and ratings indicated; complete with, but not limited to, housings, energy-efficient lamps, lamp holders, reflectors, energy efficient ballasts, starters and wiring. Ship fixtures factory-assembled, with parts required for a complete installation. Design fixtures with concealed hinges and catches, with metal parts grounded as common unit, and so constructed as to dampen ballast generated noise.

C. Metal Parts: Free from burrs, sharp edges, and corners.

D. Sheet Metal Components: Corrosion-resistant aluminum, unless otherwise indicated. Form and support to prevent warping and sagging.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

F. Doors, Frames, and Other Internals Access: Smooth operating and free from light leakage under operating conditions. Arrange to permit re-lamping without use of tools, except where specified to be tamper resistant. Arrange doors, frames, lenses, diffusers, and other pieces to prevent accidental falling during re-lamping and secured in the operating position.

G. Exposed Hardware Material: Stainless steel finished to match luminaire.

H. Lenses, Diffusers, Covers, and Globes: 100 percents virgin acrylic plastic or water white, annealed crystal glass except as indicated.
   1. Plastic: Highly resistant to yellowing and other changes due to aging, exposure to heat and UV radiation.
   2. Lens Thickness: 0.125 inches, minimum

I. Photoelectric Relays: As follows when indicated in luminaires:

1. Contact Relays: Single throw, arranged to fail in the on position and factory set to turn light unit on at 1.5 to 3 fc and off at 4.5 to 10 fc with 15-second minimum time delay.
2. Relay Mounting: In luminaire housing

J. Finish: As follows except as indicated:
1. Pretreatment: Minimum 5-stage
2. Powder Coat: Electrostatically applied baked on textured acrylic enamel except as indicated. Two coats minimum. Color as indicated.

K. Electrostatically applied baked on textured acrylic enamel except as indicated. Color as indicated.

2.3 SUSPENDED FIXTURE SUPPORT COMPONENTS

A. Rod Hangers: 3/16 inch diameter cadmium plated, threaded steel rod.

B. Hook Hanger: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking type plug.

2.4 FLUORESCENT FIXTURES

A. Electronic Ballasts: Solid-State, full light output, energy saving type. Conform to FCC rules Part 15, subpart J for electromagnetic interference. Conform to IEEE C62.51, "Guide for Surge Voltages in Low-Voltage AC Power Circuits," Category A, for resistance to voltage surges for normal and common modes.
1. Ballast shall operate the lamps at a frequency of 25 KHz or higher with less than 2% lamp flicker.
2. Ballast shall operate at within 10% of input voltage at an input frequency of 60 Hz. Light output shall remain constant for line voltage fluctuation of 5%.
3. Ballast shall have a guaranteed minimum power factor of 0.90. (PF = Watts/Volt-Amps).
4. Ballast shall not contain PCBs.
5. Ballast shall have less than 1.5 lamp current crest factor for rapid start and less than 1.7 for instant start. (Crest factor is defined as lamp peak current divided by lamp RMS current).
6. Ballast shall have less than 10% total harmonic distortion.
7. Ballast shall be better than 90% efficient (power out/power in).
8. Ballast noise shall be better than sound rated A. (No audible noise)
9. Ballast must be Underwriters Laboratories (UL) listed Class P
10. Ballasts shall be individually fused.
11. Ballast shall have 5 years minimum replacement warranty. Warranty shall include labor for replacement.
12. Maximum inrush current shall be 20 times rated current or less.
13. Ballast shall be rapid start, and parallel wired operation.
14. Dimmable ballast
    a. Shall control light output from 100% to as low as 5% relative light output for parallel operation.
    b. Shall ignite the lamps at any output setting without first going to another output setting.
    c. Shall not be a 2-wire system.

B. Fluorescent Lamps: Shall contain less than 100 pictograms of mercury per lamp.

2.5 HIGH INTENSITY DISCHARGE (HID) FIXTURES

A. Provide HID lamp ballasts, of ratings, types and makes as recommended by lamp manufacturer. Ballasts shall be type Constant Wattage Auto Transformer, 1 phase, 60 hertz, high power factor with wattage regulation for low in-rush current characteristics.

B. Ballast's for HID lamps shall have the lowest sound rating available for each ballast type.

C. Core and coil ballasts shall be encapsulated type with high thermal conductivity potting material.

D. Ballasts shall be individually fused. Fuse ratings shall be based on 2-1/2 times the rated nominal operating line current.

E. Mercury fixtures are not acceptable.

2.6 INCANDESCENT FIXTURES

A. Conform to UL 1571, "Incandescent Lighting Fixtures."

2.7 LIGHT EMITTING DIODE (LED) FIXTURES

A. Light Emitting Diode Luminaire:
   1. Provide LED fixtures complete with LED module, aluminum heat sink, drivers, base, pole, and other accessories as shown in drawings.
   2. Fixture shall be completely designed based on LEDs and not designed around an LED-based lamp meant to install into an existing fixture. Retrofit LED lamp/module into an existing fixture shall not be allowed.
   3. Aluminum Heat Sinks: All LED luminaires shall have an aluminum heat sink integral to fixture housing and designed for proper electrical bonding of LED module to allow maximum heat dissipation and to provide thermal management within the allowable operating range of the LED as specified by the LED manufacturer. The junction temperature (Tj) of each LED shall not exceed the maximum junction temperature specified in the manufacturer's product data sheet.
   4. Unless noted otherwise on the drawings, LEDs installed in each fixture shall be of the type specifically recommended by the manufacturer of the fixture for use in the fixture.

B. Light Emitting Diode System Drivers:
   1. Provide LED system drivers, of ratings, types and makes as recommended by LED manufacturer. Driver for LED systems shall be electronic, 1 phase, 60 hertz, high power factor, constant current, electronic, low noise level, a minus 40 deg C temperature rating, and shall be furnished by the manufacturer of each type or particular lighting fixture specified.
   2. Driver shall have a Class A sound rating.
   3. Driver shall have a guaranteed minimum power factor of 0.90. (PF = Watts/Volt-Amps).

4. Driver shall be installed inside an electrical enclosure. Wiring inside electrical enclosure shall comply with 600V/105degC rating or higher.
5. Driver shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.
6. Driver shall be provided with poke-in wire trap connectors or integral leads color coded per ANSI C82.11.
7. Driver shall comply with UL standard UL1012
8. Driver shall have a rated lifetime of 50,000 hours
9. Driver shall operate from 60 Hz input source of 120 to 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the Driver
10. Driver output shall be regulated to +/- 5% across published load range.
11. Driver input current shall have Total Harmonic Distortion (THD) of less than 20%
12. Driver shall reduce output power to LEDs if its case temperature exceeds 85C - thermal protection.
13. Driver shall tolerate sustained open circuit and short circuit output conditions without damage and without need for external fuses or trip devices
14. Driver shall be IP64 rated except as indicated.
15. Driver shall not contain PCBs.
16. Driver shall comply with ANSI C62.41 Category A for Transient protection.
17. Driver shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR parth 15, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).
18. Driver shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
19. Driver shall carry a five-year manufacturer's warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 90C.
20. Driver manufacturer shall have a fifteen year history of producing electronic drivers for the North American market.

C. Light Emitting Diode System Module: LED Modules shall be of the type, color, and optical distribution indicated, as shown, and scheduled
1. LEDs shall be handled and soldered to printed circuit boards (PCBs) according to the manufacturers specifications.
2. LEDs shall produce a white light of the color temperature shown on the Fixture Schedule located on the drawings and not less than 75CRI value on the color rendering index.
3. LEDs shall be high brightness and high output.
4. LED performance and lumen maintenance testing shall be performed in accordance with IES LM-79-08 and LM-80-08.
5. LEDs shall provide approximately 50,000 hours of lighting at a level not less than 70% of initial lumen output.
6. LEDs shall operate from 60 Hz input source of constant 350mA with sustained variations of +/- 10% (current and frequency) with no damage to the LEDs.
7. LED lumen output shall be regulated to meet or exceed the published standard minimum luminous flux.
8. LEDs shall be within +/- 200K of specified color temperature shown in Fixture Schedule on drawings and shall be from the same bin.
9. LED manufacturer shall utilize strict binning and labeling techniques to ensure consistent brightness within +6 lm of published standard luminous flux and

consistent chromaticity within +/-200K of specified color temperature per bin. Each bin shall be labeled with appropriate bin code relative to luminous flux and chromaticity.

10. LEDs shall have a minimum operating temperature of -40C.
11. LEDs shall be environmentally friendly, contain no mercury, lead or other heavy metals, and manufactured in compliance with RoHS and REACH.
12. LEDs and associated components of the LED Modules shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
13. LEDs and associated components of the LED Modules shall carry a five-year manufacturer's warranty from date of manufacture against defects in material or workmanship, including replacement, for operation within specified system design parameters.
14. LED manufacturer shall have a fifteen year history of producing LEDs for the North American market.

2.8 LAMPS

A. Provide all lamps as listed in the fixture schedule on the drawings or as described here under.

B. All lamps shall be low mercury type when available.

C. Incandescent lamps for general service, inside-frosted, wattage at 130 volt as noted on the lighting fixture schedule.

D. Minimum lamp life ratings (hours):
   1. Linear Fluorescent 20,000
   2. Compact Fluorescent 16,000
   3. Ceramic Metal Halide
      a. PAR 10,000
      b. Pin Base
         1) <200W 12,000
         2) >200W 20,000
      c. Medium Base 24,000
      d. Mogul Base 24,000
   4. Metal Halide 15,000
   5. High Pressure Sodium 24,000
   6. Incandescent 2,000
   7. Light Emitting Diode 50,000

E. Metal halide lamps shall be clear or coated

2.9 EMERGENCY BATTERY PACKS

A. Self test and self diagnostic

B. Minimum Emergency Lumen Output:
   1. Compact Fluorescent:
      a. 1-lamp: 500 lumens
      b. 2-lamp: 1100 lumens
   2. Linear Fluorescent: 1100 Lumens

3. LED Troffer: 1100 Lumens
4. LED Downlights
   a. <1000 Lumens: 500 lumens
   b. 1000 - 2000 Lumens 1000 lumens

C. Run time: 90 minutes

D. Batteries: Nickel Cadmium

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions under which lighting fixtures are to be installed, and substrate for supporting lighting fixtures. Notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 INSTALLATION

A. Install interior lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NECA's "Standard of Installation", NEMA standards, and with recognized industry practices to ensure that lighting fixtures fulfill requirements.

B. Setting and Securing: Set units plumb, square, and level with ceiling and walls, and secure according to manufacturers printed instructions and approved shop drawings.

C. Recessed Fixtures: Installed units may be supported from suspended ceiling support system. Install ceiling system support rods or wires at a minimum of four rods or wires per fixture located not more than 6 inches from fixture corners.
   1. Fixtures Smaller Than Ceiling Grid: Install a minimum of four rods or wires for each fixture and locate at corner of the ceiling grid where the fixture is located. Do not support fixtures by ceiling acoustical panels.
   2. Fixtures of Sizes Less than Ceiling Grid: Center in the acoustical panel. Support fixtures independently with at least two ¾ inch metal channels spanning and secured to the ceiling tees.
   3. Install support clips for recessed fixtures, securely fastened to ceiling grid members, at or near each fixture corners.

D. Light fixtures in suspended ceiling systems shall be positively attached to the ceiling system using screws or manufacturer supplied clips, in accordance with manufacturer written instructions. When using screws avoid bending fixture frame. Minimum of four attachment points, additional if required.

E. Light fixtures in suspended ceiling systems shall be connected with a flexible wiring method. Provide additional length to allow the fixture to be moved two feet in any direction.

F. Provide fixtures and/or fixture outlet boxes with hangers to properly support fixture weight. Submit design of hangers, method of fastening, other than indicated or specified herein, for review by Architect.

G. Install flush mounted fixtures to eliminate light leakage between fixture frame and finished surface.

H. Provide plaster frames for recessed fixtures installed in other than suspended grid type acoustical ceiling systems. Brace frames temporarily to prevent distortion during handling.

I. For air supply type fixtures, retain side slot closures in place for adjustment by Balancing Contractor.

J. Fasten fixtures securely to indicated structural supports; and ensure that pendant fixtures are plumb and level. Provide individually mounted pendant fixtures longer than 2 feet with twin stem hangers. Provide stem hanger with ball aligners and provisions for minimum 1" vertical adjustment. Mount continuous rows of fixtures with an additional stem hanger greater than number of fixtures in the row.

K. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Stds 486A and B, and the National Electrical Code.

L. Support surface mounted fixtures greater than 2 feet in length at a point in addition to the outlet box fixture stud.

3.3 FIELD QUALITY CONTROL:

A. Permanent LED fixtures installed as part of the Contract may not be used for construction lighting.

B. At Date of Substantial Completion, replace lamps in interior lighting fixtures which are observed to be noticeably dimmed after Contractor's use and testing, as judged by Architect.

C. Any lamp or LED Module as judged by the Architect as having a different apparent color or apparent color rendering shall be replaced by the Contractor without any additional cost.

3.4 AIMING, ADJUSTMENT, AND CLEANING

A. All adjustable lighting units shall be aimed by the Contractor under the supervision of the Architect. All aiming shall be done after the installation is complete. Where daylight interferes, as deemed by the Architect, with the aiming the aiming shall be done at night.

B. Clean interior lighting fixtures of dirt and construction debris upon completion of installation. Clean fingerprints and smudges from lenses.

C. Protect installed fixtures from damage during remainder of construction period.

3.5 DEMONSTRATION

A. Upon completion of installation of interior lighting fixtures, and after building circuitry has been energized, apply electrical energy to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.

END OF SECTION

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DIVISION 27

COMMUNICATIONS

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SECTION 27 0000
COMMUNICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Provide and install a complete data wiring system. This system shall include but not limited to patch panels, punch down blocks and terminators, plenum rated wiring of category specified, cable jacks, plates, labels, complete test meeting IEEE TIA 568b standards for each device/wire after completion of installation, etc. All wiring to be installed and supported independent of all other support systems in a neat and organized fashion. Wiring shall be routed so there is separation from all electrical devices, fixtures, electrical power wiring, etc.

1.2 STANDARDS

A. Conformance to the latest revision of the following is required under this specification.
   1. FCC Part 15 - Radio Frequency Devices and Radiation Limits
   2. FCC Part 68 - Connection of Terminal Equipment to the Telephone Network
   3. NEC
   4. National, state, and local building and fire codes.
   5. TIA/EIA 568 - Commercial Building Telecommunications Cabling Standard
   6. TIA/EIA 569 - Commercial Building Standard for Telecommunications Pathways and Spaces.
   7. TIA/EIA 606 - Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
   8. UL

1.3 GENERAL REQUIREMENTS

A. Provide on the existing backboard the appropriate number of termination/connection blocks, having the appropriate capacities, as required for all telephone cables being connected as part of this project, and make all required connections. Provide all required cross connections.

B. Provide data patch panels to the building; make thereon all connections required for the data cables being provided as part of the project, utilizing connections hardware which is appropriate for the respective applications. Install in existing rack.

C. Provide telephone outlets where shown on the drawings. Each telephone outlet shall consist of an outlet box recessed to the full extent practicable.

D. Provide data outlets where shown on the drawings. Each computer outlet shall consist of an outlet box recessed to the full extent practicable.

E. Provide a combination telephone/data outlet where shown on the drawings. Each combination shall consist of an outlet box recessed to the full extent practicable.

F. Provide a 3/4" EMT conduit, from each telephone outlet and each data outlet into the drop ceiling or to equipment room backboard, unless shown on the drawings

otherwise. Provide a cable from each telephone station outlet and data outlet, though the respecting conduit to the appropriate telecommunication equipment room backboard or patch panel located in the building. Make the proper cable termination/connection at each end of the each such cable utilizing the connecting hardware which is appropriate for the respective applications.

G. Completely test and prove all data cables, all telephone cables, all terminations/connections, all equipment, and all devices, before and after installation and connection, to the architect's and the owner's complete satisfaction, and as required for the proper operation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products of one of the following or prior approved equal:
   1. Amp
   2. Mohawk
   3. Berk-Tek
   4. Belden
   5. Leviton
   6. Ortronics
   7. Nordx

2.2 HORIZONTAL DATA & TELEPHONE CABLE - IDF TO STATION

A. Category 6, 100 ohm, 4-pair, unshielded twisted pair (UTP), #24 AWG insulated copper conductors

B. Type: CMP

C. Jacket Color:
   1. Telephone: White
   2. Data: Blue

D. Insulation: Fully insulated with retardant low-smoke thermoplastic material.

E. Color code twisted pairs individually, within color coded bundles, to industry standards (ANSI/ICEA Publications 80-576, and EIA-230).

F. Label all drops on both ends indicating where the other end of the cable terminates (patch panel, wall plate, etc.)

2.3 HORIZONTAL CABLING PATCH PANELS

A. Rack mounted, 48-port, modular panel

B. One-piece steel construction with factory-applied black baked enamel finish, with device, junction fittings and other matching accessories as required for a complete category 6 system and per UL 5.

2.4 TERMINAL BLOCKS

A. Terminate telephone cabling to existing terminal blocks

2.5 LABELS

A. Provide self-laminating adhesive labels, machine printable with a laser printer suitable for cable diameters installed.

B. Printable area: 2-inchesby 1/2-inch

C. Color: white

2.6 CONNECTORS

A. Color to be selected at time of submittal for each type.

B. Copper - Category 6, 8-pin modular connectors, T568-a wired.

C. Provide station outlets with connectors. Provide permanent machine generated clear laminated labels on the front of each faceplate or surface box.

2.7 CABLE SUPPORTS

A. Provide J-hooks rated to support category 6 cable and optical fiber cable, mounted 5-feet on-center for support of horizontal cabling. Provide J-hooks with a static load capacity of 30 pounds per hook and fastener hole that accepts 1/4-inch bolts Do not exceed 40 percent fill ratio.

B. Galvanized steel construction and 90 degree rolled safety edges.

C. Latched retainers to contain cables within the hook area.

2.8 FACEPLATES

A. Face plates shall be single gang with multi-ports as required for terminations. See 26 27 26 - Wiring Devices for colors.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All data cabling terminating in the rack will have a service loop of no less than 8 feet located above the ceiling where it enters the room. All data cabling will be installed IAW with TIA/EIA-568b "Commercial Building Standard for Telecommunications Pathways and Spaces". Telephone cabling will be installed per telephone industry standard TIA/EIA 568-b.2-1.

B. Terminate all data and telephone drops. Modular wall plates and surface blocks shall be used to terminate the data cable and in the patch panels inside the rack. RJ45 TIA/EIA CAT 6 connectors shall be used for the data drops. All telephone cabling shall be terminated in RJ45 jacks and wall plates or surface blocks at outlets and on wall mounted punch down blocks.

C. The telephone pair shall be terminated at the correct insert pair for a telephone application.

D. Provide a continuous single cable, homogeneous in nature for every cable run. Splices are not permitted. Space as defined by the local building code. The cable shall be installed in a workmanlike manner and comply with standard TIA/EIA CAT 6 system requirements, and all local, state and national codes. Floor penetrations and conduit sleeves should allow 25% extra room for future cabling requirements.

E. Support station cables exiting the telecommunications room every 5-feet on-center using j-hook cable hangers in call accessible ceilings.

F. Do not exceed 300-feet in length from the termination at the user's faceplate to the termination at the telecommunications rooms.

G. All wiring located above hard or inaccessible ceilings shall be routed in conduit. Where only a portion of the wiring is installed in hard or inaccessible ceilings the wiring shall be in conduit for the entire length of that is routed through the hard or inaccessible ceilings. Refer to Section 26 05 33 for conduit requirements.

H. Provide a minimum of 6 inches of slack sheathed cable behind each station outlet faceplate. Coil slack cable inside the junction box or raceway as per the cabling manufacturer's installation standards.

I. Route cables a minimum of 6 inches away from power sources to reduce interference from EMI.

J. Install cables with sufficient bending radius so as not to break or kink, shear or damage binders, or to interfere with transmission in any way.

K. Neatly dress and organize cables in the accessible ceiling sequentially into groups of 12. Wrap every 24 inches with velcro cable ties as required. Do not tightly bundle cables together.

L. Route cable homeruns, parallel and perpendicular to building structure allowing for bending radius, and along corridors for ease of access. Do not route cables through an adjacent space if a corridor borders at least one wall of the room.

M. Provide permanent machine generated labels on each end of the cable no more than 4 inches from the edge of the cable jacket.

N. Terminate cables with category 6 modular connectors and T568-a pin-pair assignment.

O. Test cables to TIA/EIA 568 performance standard for the appropriate cable type. Reterminate or replace any cables that do not meet the performance standard.

3.2 INSPECTION

A. Test results
   1. Provide one electronic copy and one printed copy of cable test results documentation appropriately formatted for retrieval by the contracting officer.
   2. Provide the Architect and Owner with a written form of acceptance for signature. All corrections must be completed before acceptance is given.

END OF SECTION

DIVISION 31

EARTHWORK

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SECTION 31 3116
TERMITE CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Chemical soil treatment.

1.2 REFERENCE STANDARDS

A. Title 7, United States Code, 136 through 136y - Federal Insecticide, Fungicide and Rodenticide Act; United States Code; 1947 (Revised 2001).

1.3 SUBMITTALS

A. See Section 01 3300 - Submittal Procedures.

B. Product Data: Indicate toxicants to be used, composition by percentage, dilution schedule, intended application rate.

C. Test Reports: Indicate regulatory agency approval reports when required.

D. Manufacturer's Application Instructions: Indicate caution requirements and ____.

E. Manufacturer's Certificate: Certify that toxicants meet or exceed specified requirements.

F. Certificate of compliance from authority having jurisdiction indicating approval of toxicants.

G. Record moisture content of soil before application.

H. Maintenance Data: Indicate re-treatment schedule .

I. Warranty: Submit warranty and ensure that forms have been completed in Owner's name.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing this type of work and:
   1. Having minimum of 2 years documented experience.
   2. Approved by manufacturer of treatment materials.
   3. Licensed in LOUISIANA.

1.5 WARRANTY

A. See Section 01 7780 - Closeout Submittals, for additional warranty requirements.

B. Provide five year installer's warranty against damage to building caused by termites.

1. Include coverage for repairs to building and to contents damaged due to building damage. Repair damage and, if required, re-treat.
   a. Treatment shall be performed by a licensed and bonded applicator in accordance with requirements of the Louisiana Structural Pest Commission, and shall be guaranteed in writing for a period of five (5) years from time of Substantial Completion. Limits of insurance shall be minimum $50,000.00, subject to annual renewal thereafter. Warranty shall state concentrations and rates of application used.
   b. If Subterranean or Formosan termite activity is discovered in or under buildings during the Warranty period, upon notification by the Owner, the applicator shall promptly and without expense to the Owner re-treat the soil, using means acceptable to the Owner, and make good all damage caused by Subterranean or Formosan termite activity, up to the specified limits of insurance. Furnish Owner with 2 copies of Warranty.
2. Inspect annually and report in writing to Owner. Provide inspection service for 1 years from Date of Substantial Completion.
   a. Continuing Service: Beginning at Substantial Completion, provide 12 months' continuing service including monitoring, inspection, and re-treatment for occurrences of termite activity. Provide a standard continuing service agreement. State services, obligations, conditions, and terms for agreement period; and terms for future renewal options.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers:
   1. Bayer Environmental Science Corp; Product Premise: www.backedbybayer.com/pest-management.
   2. Syngenta Professional Products; Product Demon Max or ProBuild TC: www.syngentaprofessionalproducts.com.
   3. BASF; Product Termidor: www.basf.com.
   4. Substitutions: See Section 01 6300 - Product Substitution Procedures.
      a. Product selections are based on physical properties and design qualities integral to the design of the project. All substitutions must meet the criteria stipulated in this section, and the substitution must meet the aesthetic qualities and intent of the design to the satisfaction of the Architect. The Architect's decision regarding this matter is final.

B. Toxicant Chemical: EPA approved; synthetically color dyed to permit visual identification of treated soil.

C. Diluent: Recommended by toxicant manufacturer.

2.2 MIXES

A. Mix toxicant to manufacturer's instructions.

B. SOIL TREATMENT

1. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label. Product to treat against Formosa termites (Coptotermes species).

C. BAIT TREATMENT SYSTEM
1. Provide bait stations based on the dimensions of building perimeter, according to manufacturer's EPA-Registered Label for product and manufacturer's written instructions. Provide the following product:

PART 3 EXECUTION

3.1 PREPARATION

A. General: Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations. Post warning signs in areas of application.

B. Soil Treatment Preparation: Loosen, rake, and level soil to be treated except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.

3.2 EXAMINATION

A. Verify that soil surfaces are unfrozen, sufficiently dry to absorb toxicant, and ready to receive treatment.

B. Verify final grading is complete.

3.3 APPLICATION

A. Comply with requirements of U.S. EPA and applicable state and local codes.

B. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute treatment evenly.

C. Slabs-on-Grade: Underground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.

D. Foundations: Adjacent soil including soil along the entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes

and electric conduit penetrating the slab, and around interior column footers, piers, and chimney bases; also along the entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.

E. Masonry: Treat voids.

F. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.

G. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.

H. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed.

I. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

J. Spray apply toxicant in accordance with manufacturer's instructions.

K. Apply toxicant at following locations:
   1. Under Slabs-on-Grade.

L. Under slabs, apply toxicant immediately prior to installation of vapor barrier.

M. Apply extra treatment to structure penetration surfaces such as pipe or ducts, and soil penetrations such as grounding rods or posts.

N. Re-treat disturbed treated soil with same toxicant as original treatment.

O. If inspection or testing identifies the presence of termites, re-treat soil and re-test.

3.4 INSTALLATION OF BAIT-STATION SYSTEMS

A. Place bait stations according to the EPA-Registered Label for the product and manufacturer’s written instructions, in areas that are conducive to termite feeding and activity including near irrigation sprinkler heads, along drip lines of roof overhangs without gutters, and other sites and locations around the existing building as determined licensed Installer

B. Place bait stations according to the EPA-Registered Label for the product and manufacturer’s written instructions, in areas that are conducive to termite feeding and activity including near irrigation sprinkler heads, along drip lines of roof overhangs without gutters, and other sites and locations around the existing building as determined licensed Installer

3.5 CLEAN-UP

A. Upon completion of treatment work, remove from the premises all trash and debris, including wood and other foreign materials removed during preparation, related to treatment.

3.6 PROTECTION

A. Do not permit soil grading over treated work.

END OF SECTION

SECTION 31 6200
DRIVEN PILES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Treated timber job piles.

1.2 TESTING LABORATORY SERVICES

A. Piles: The independent Testing Laboratory shall perform the following services:
1. Inspection: Perform inspections at point of treatment and at project site. Mark conforming piles for identification.
2. Logging: Log the driving of all piling and record the following:
   a. Date driven, type of hammer, pile description including tip, length and butt dimensions measured just prior to driving, pre-drilling size, depth, and time, downtime, and any unusual driving conditions.
   b. Location of pile.
   c. Number of blows per foot for full length of pile.
   d. Tip and butt elevation.
   e. Vibration Measurements during all driving operations. Driving shall be terminated, and the Architect advised for sustained peak particle velocities in excess of .25in. per second.
   f. Record control elevations provided by Contractor.
3. Heaved piles.
4. Reporting: Submit driving records daily.
5. Pile numbering plan.

1.3 CONTRACTOR DUTIES

A. Protection of Property: The Contractor shall document the conditions of existing paving, structures, sewers, utilities, and other property on and adjacent to the work site and shall take suitable precautions to protect such property from damage which could result from the piling work. Should damage occur due to Contractor's operations, the Contractor shall repair or replace the damaged work to restore it to its original condition, without additional cost to the Owner. The survey Information shall not preclude the Contractor from performing the required investigative work prior to driving operations to verify clearance from underground utilities.
1. Documentation: Photograph existing conditions of structures, finishes, equipment, and adjacent improvements that might be construed as damage resulting from pile driving operations. File photos with Architect before starting pile driving.

B. Notification: The Contractor shall notify the Architect, Owner and the Testing Laboratory 48 hours prior to driving initial pile. Pile driving must not commence without the Testing Laboratory representative being present. The Engineer shall be contacted after the installation of the first pile, prior to proceeding with additional piles. Direction on how to proceed will be given at that time.

C. Regulatory Agency: In accordance with the applicable Building Code, the Contractor shall notify the Director of the responsible regulatory agency at least 24 hours in advance of pile driving.

1.4 SUBMITTALS

A. General: Submit the following for review.
1. Driving Equipment: Descriptive data for hammer, pre-punch, and other accessory equipment.
2. Timber pile sketch indicating length and tip/butt dimensions.
3. Preservative treatment.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to Project site in such quantities and at such times to ensure continuity of pile driving operations and adherence to project schedule.

B. Storage: Store piles in orderly groups above ground and blocked to prevent distortion of piles.

C. Handling: Handle piles carefully without dropping, breaking, or abrading the surface. Repair damage or replace with new material.

D. Brush treat all cut or damaged surfaces of treated piles, including the tops of piles after cut-off. Treatment complying with AWPA M4 and P9 to fill all shakes and splits and thoroughly penetrate the cut surfaces.

1.6 PROJECT CONDITIONS

A. Basis for Bids: Bids shall be based on indicated number of piles and dimensions from required tip elevation to cut-off, plus extra length above the cut-off elevation as required for driving.

B. No payment will be made for rejected piles including piles driven out of place, imperfect piles, or piles damaged in driving or handling.

C. Site Information: Data for subsurface conditions is available through the Owner and is not intended as a representation or warranty of continuity of conditions. It is expressly understood that the Owner, the Architect, and the Architect's consultants will not be

responsible for interpretations or conclusions drawn by Contractor from the data which is made available for the information and convenience of Contractor.

D. Protection: Protect structures, utilities, and other improvements and construction from damage caused by pile driving operations.

E. Control: Establish surveyed elevation bench marks on structures where directed by Architect before commencing work when structures are within 10 feet of pile driving operations. Record and report elevation of each bench mark at least twice a day while pile driving is in progress and at completion of driving. If bench mark readings indicate displacement, halt driving operations until corrective action has been provided and is acceptable to Architect.

F. Test Pile Program:
1. A test pile program has previously been completed.

PART 2 PRODUCTS

2.1 PILES

A. Treated Piles: Southern Pine conforming to ASTM D25 with dimensions as follows:
1. Minimum tip diameter shall be 6".
2. Minimum butt diameter 8”.
3. Tip elevation = 42” below existing grade.

B. Preservative Treatment: Comply with AWPA Standards C1 and C3 for foundation piles using chromated copper arsenate (CCA) with a minimum wet retention of .80 lbs. per cu. foot. Testing of retention by the gauge method will be acceptable.

C. Brush Treatment: Comply with AWPA M4 and P9.

D. Identification: Every treated pile shall be identified in accordance with AWPA M1 by branding or aluminum tag.

E. Pile Length Markings: Mark each pile with horizontal lines at 1'-0" intervals, and the number of feet from pile point at 5'-0" intervals.

2.2 DRIVING EQUIPMENT

A. General: Provide pile driving equipment of type generally used in standard pile driving practice, operated at manufacturer's specified rate, to develop required rated energy per blow.

B. Hammer: Single acting air hammer delivering 7,260 FT/LB of energy per blow (Vulcan No. 2) with refusal established as 25 blows per foot.

C. Driving Procedure: Driving shall be done with fixed leads that shall hold the pile firmly in position and in alignment with the hammer. The butt of each timber pile before driving shall be cut at right angles to the longitudinal axis of the pile, and shall be taper trimmed. The top of the pile shall be protected with a standard steel hood or similar type device, which will prevent damage to the pile during driving. Driving shall progress continuously until the specified tip elevation is reached. Should refusal be obtained prior to reaching the specified tip embedment, terminate driving operations and notify Architect immediately.

D. Location: Piles shall be driven plumb and accurately into positions shown on drawings: a maximum variation not exceeding 3" will be accepted as fulfillment of contract. Should the variation from true center exceed the above, the piles in each cluster shall be plotted by the Contractor and the center of gravity of said cluster determined. If required, sufficient piles shall then be added at locations determined by the Architect. Contractor shall, at his own cost, drive such additional piling and/or alter pile caps as may be required to compensate for or to rectify the conditions brought about by failure to preserve proper spacing, whether this defect is discovered before or after the conclusion of driving.

E. Over-Driving: Any piles driven too low to permit proper cut-off must be corrected without extra charge. Any pile, which is damaged, defected, or broken, or any pile which cannot be driven to proper tip penetration because of interference by stumps or other underground obstructions, shall be immediately removed and replaced with an acceptable substitute pile at the location determined by the Architect. Solidly fill spaces left by withdrawn piles that will not be filled by new piles using cohesion less soil material such as gravel, broken stone, and gravel-sand mixtures. Place and compact throughout length of space in lifts not exceeding 6-feet. In the event that such removal should prove impossible the defective pile shall be abandoned and a suitable pile shall be driven close to the worthless one, where the Architect directs. Payment will be made to the Contractor in accordance with the terms of the contract unless the defect is due to the Contractor's negligence.

F. Pre-Punch: 6” diameter steel spud.

PART 3 EXECUTION

3.1 PRELIMINARY WORK

A. Investigation of Utilities: Investigate locations of underground utilities to identify possible interferences, before starting pile driving. Notify Architect of any interference discovered before or during driving and obtain instructions before proceeding.

B. Site Conditions: Do not drive piles until the building pad fill has been installed.

3.2 DRIVING PILES

A. General: Continuously drive piles at locations indicated to a tip elevation of 42 feet below existing grade. Refusal shall be established as 25 blows per foot. Terminate driving operations and notify Architect immediately if refusal is obtained prior to the specific tip embedment.

B. Pre-punch: Immediately prior to each pile's installation pre-punch 5'-0" deep.

C. Corrections for Misdriven Piles: If variations exceed the tolerances specified above, unless limiting and controlling conditions as determined by the Architect make it impossible to maintain positions more accurately, the Contractor shall furnish and drive additional piles and/or modify pile caps, as instructed by the Architect, without additional cost to the Owner.

1. The Contractor shall plot the pile locations in each cluster and submit data to the Architect, who will then issue instructions for corrective action.
2. Additional piles and/or alterations to pile caps to compensate for or rectify failures to achieve proper locations will be the Contractor's responsibility, whether defects are discovered before or after cutting off.

D. Heaved Piles: Provide recorded instrument observations made during pile driving to determine whether driven pile has lifted from its original seat during driving of adjacent piles. If uplift occurs, re-drive affected piles to point elevation at least as deep as original point elevation with a driving resistance at least as great as original driving resistance.

E. Damaged Piles: Damaged piles will not be accepted. Any pile which is damaged, broken, or deflected, or which cannot be driven to required penetration because of underground obstructions, shall be rejected.

F. Over-Driven Piles: Any piles driven too low to permit proper cut-off shall be corrected without additional cost to the Owner, as instructed by the Architect.

G. Cutting-Off: Cut-off tops of driven piles on a horizontal plane and at elevations indicated. Dispose of excess materials off site.

H. Pile Driving Operations shall immediately be terminated, and the Architect contacted, if sustained vibrations exceed .25 in/sec.

3.3 CUT OFF

A. Piles shall be cut-off on a neat horizontal plane and the cut-off portions shall be removed from the job site. No additional compensation or time will be allowed regardless of the length of cut-off to be removed.

B. Treat tops of timber piles, after cut off, with 2 brush coats of preservative.

END OF SECTION

APPENDIXES

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APPENDIX A

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GEOTECHNICAL INVESTIGATION

ST. JOHN THE BAPTIST PARISH

WEST BANK LIBRARY

EDGARD, LOUISIANA

FOR
ST. JOHN THE BAPTIST PARISH LIBRARY
LAPLACE, LOUISIANA

SIZELER ARCHITECTS
NEW ORLEANS, LOUISIANA

By
Eustis Engineering Company, Inc.
Metairie, Louisiana

21 AUGUST 1998

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GEOTECHNICAL INVESTIGATION
ST. JOHN THE BAPTIST PARISH
WEST BANK LIBRARY
EDGARD, LOUISIANA

INTRODUCTION

1. This report contains the results of a geotechnical investigation performed for the proposed St. John the Baptist Parish west bank library in Edgard, Louisiana. The investigation was approved by a representative of St. John the Baptist Parish Library by signed acceptance of Eustis Engineering Company, Inc.'s proposal dated 7 July 1998. Sizeler Architects are the architects and Schrenk & Peterson Consulting Engineers Inc. are the structural engineers for the project.

2. This report has been prepared in accordance with generally accepted geotechnical engineering practice for the exclusive use of the St. John the Baptist Parish Library and their consultants for specific application to the subject site. In the event any changes in the nature, design, or location of the proposed facility are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing. Should these data be used by anyone other than the St. John the Baptist Parish Library or their consultants, they should contact Eustis Engineering for

interpretation of data and to secure other information that may be pertinent to this project.

3. Recommendations and conclusions contained in this report are to some degree subjective. The report in its entirety should not be included in the contract plans and specifications. However, the results of the soil borings and laboratory tests contained in the Appendix of this report may be included in the plans and specifications.

4. The analyses and recommendations contained in this report are based in part on data obtained from the soil borings. The nature and extent of variations in subsoil conditions that may exist between and away from the boring locations may not become evident until construction. If variations then appear, it will be necessary to reevaluate the recommendations contained in this report.

SCOPE

5. This investigation included the drilling of two undisturbed sample type soil test borings to determine subsoil conditions and stratification, and to obtain samples of the various strata encountered. Soil mechanics laboratory tests performed on samples obtained from the borings were used to evaluate the physical properties of the subsoils. Engineering analyses, based on the soil borings and laboratory test results, were performed to determine estimates of allowable soil bearing values, allowable pile load capacities, and settlement.

Recommendations were also formulated regarding site preparation, rigid and flexible pavement components, and foundation construction procedures.

SOIL BORINGS

6. Two undisturbed soil test borings were drilled on 7 August 1998 at the locations shown on Figure 1. The borings were located using a site plan furnished by Sizeler Architects. The undisturbed borings were made to the 20 and 50-ft depths for the project. Detailed descriptive logs of the borings are shown in both tabular and graphical form in the Appendix.

7. The undisturbed borings were made with a truck mounted rotary type drill rig. Undisturbed samples of cohesive or semi-cohesive subsoils were obtained at close intervals or changes in strata using a 3-in. diameter thinwall Shelby tube sampling barrel. The samples were immediately extruded from the sampling barrel, inspected, and visually classified by Eustis Engineering's soil technician. Pocket penetrometer tests were performed on the soil samples to give a general indication of their shear strength or consistency. The results of these tests are shown on the boring logs under the column heading "PP." Representative samples were placed in moisture proof containers and sealed for preservation. Upon completion of drilling operations, the borings were backfilled in accordance with current regulatory requirements.

8. Samples of cohesionless materials were obtained during the performance of Standard Penetration Tests. The Standard Penetration Test consists of driving a 2-in. diameter sampler 1 foot into the soil after first seating it 6 inches. A

140-lb weight dropped 30 inches is used to advance the sampler. The number of blows required to drive the sampler is indicative of the relative density of cohesionless soils and the consistency of cohesive soils. The results of the Standard Penetration Tests are shown on the boring logs under the column heading "SPT." Samples obtained during the Standard Penetration Tests were retained in glass jars for subsequent laboratory tests.

LABORATORY TESTS

9. A series of soil mechanics laboratory tests was performed on undisturbed samples obtained from the borings. Included in these laboratory tests were natural water content, unit weight, and unconfined compression shear (UC). The results of these laboratory tests are shown on the boring logs in the Appendix.

DESCRIPTION OF SUBSOIL CONDITIONS

Stratigraphy

10. The soils encountered at the borings consist of medium stiff to very stiff gray, tan, brown and tan, and brown and gray silty clay or sandy clay from the ground surface to the approximate 4-ft depth. Medium stiff to stiff tan, tan and brown, and gray and brown clay follows to the approximate 10 to 13-ft depths. Boring 1 encountered a loose gray and brown clayey silt layer between the 10 and 14-ft depths. Strata of loose gray sandy silt and very soft to soft gray and tan and light brown sandy clay or silty clay is present from

the 13 to 32-ft depths at Boring 2, and below the 14-ft depth to the termination of Boring 1 at 20 feet. Medium stiff gray clay was encountered from the approximate 32 to 36-ft depths at Boring 2. Loose to medium dense gray sand then follows to the 45-ft depth and is underlain by medium stiff gray clay to the termination of Boring 2 at 50 feet.

Ground Water

11. In order to determine the ground water conditions at the time of the field investigation, observations were made during the drilling of Boring 1. The boring was made without the addition of water to a depth of 20 feet. Free water was initially encountered at the 9-ft depth. Subsequent observations over a period of 30 minutes indicated the ground water table to be approximately 5.5 feet below the existing ground surface.

12. The depth to ground water will vary with climatic conditions, drainage improvements, and other factors. The ground water level should be determined by those persons responsible for construction immediately prior to beginning work.

FOUNDATION ANALYSIS

Furnished Information

13. The site plan provided by Sizeler Architects indicates the proposed west bank library will have approximate plan dimensions of 62' x 89'. Schrenk &

Peterson, the structural engineers for the projects, indicated half of the building will be used for book stacks with the other half being used for office space. Areas designated for the book stacks will be subjected to an approximate live load of 150 psf and a dead load of 75 psf. Areas designated for office space will be subjected to an approximate live load of 50 psf and a dead load of 75 psf.

Foundation Recommendations

14. The structure can be supported on spread or continuous footings provided the settlements presented in this report can be tolerated. The near surface soils at the site consist of clays. Without proper preparation and drainage, these soils could produce excessive settlement and differential settlement. Therefore, site preparation and drainage are extremely important.

15. As an alternative to shallow foundations, the building may be supported on a deep foundation comprised of driven treated timber pile foundations. All structural loads from the building (floor, walls, and columns) should be supported on piles having the same tip embedment below the existing ground surface in order to minimize differential settlement. Pile caps should be poured integrally with the floor slab and grade beams.

Site Preparation

16. Drainage During Construction. The initial step to prepare the site for construction should be to establish adequate temporary and permanent

drainage to prevent ponding of water and ensure immediate runoff of all rainfall. It is strongly recommended the contractor maintain adequate surface drainage away from all foundations during and after construction. This may be accomplished by setting grades to ensure positive drainage of water away from the foundation areas and providing adequate surface and subsurface drainage structures as required.

17. Permanent Drainage. Permanent drainage should direct flow away from the buildings and pavement. This may be accomplished by setting grades to ensure positive drainage of water away from the foundation areas and providing adequate surface and subsurface drainage structures as required.

18. Clearing. The ground surface should be stripped of vegetation, loose topsoil, debris, stumps, organic matter, loose fill, and any other deleterious materials. Stripping should be to the minimum depth necessary to remove any vegetation and roots. All depressions and weak areas should be thoroughly cleaned out to the surface of firm undisturbed soil and backfilled with a select structural fill material placed and compacted under controlled conditions.

19. Subgrade Preparation. After the stripping and clearing operations, the exposed surface should be crowned and sealed with several passes of a smooth steel drum roller compactor. Any depressions or weak areas identified should be thoroughly cleaned out to the surface of undisturbed soil and backfilled with a structural fill material placed and compacted under controlled conditions. All clearing and compaction operations should be performed during periods of dry weather only.

20. Structural Fill. A select granular material, such as locally available hydraulically pumped sand, should be used as backfill or fill required to reach design grade. Sand fill should be non-plastic and free of roots, clay lumps, and other deleterious materials with no more than 10% by weight of material passing a U.S. Standard No. 200 mesh sieve.

21. Compaction. Structural fill should be spread in loose lifts of 6 to 8 inches. Each lift should be compacted to at least 95% of the maximum dry density near optimum water content in accordance with ASTM D 698. All clearing and compaction operations should be accomplished during periods of dry weather only.

Shallow Foundations

22. Slab. A lightly loaded building slab may be placed to bear in compacted fill or existing subgrade. Assuming a load of 225 psf (including the sustained floor load, concrete slab, and weight of fill of 120 pcf), settlement is estimated to be 1 to 1½ inches. This represents the settlement at the center of a flexible slab. Settlement at the corners and sides should be anticipated to be 25% and 50%, respectively, of the settlement at the center. Slab settlement should be considered additive to the settlement for footings supporting separate uniform load intensities. Differential settlement between the corners, sides, and center of the slab can be minimized by providing rigidity to the slab. Uniform settlement of a rigid slab may be estimated as 85% of the center settlement for a flexible slab. For this reason, we

recommend the slab be poured monolithically with footings. Interior grade beam footings can also be added to increase rigidity.

23. Depth of Footings. Based on the boring logs, continuous grade beam footings for the proposed building should be placed to bear at least 24 inches but no more than 30 inches below the existing ground surface on firm undisturbed soil. Precautions should be exercised so excavations for footings do not become wet prior to pouring concrete. Foundations should be poured immediately after the completion of the excavations. All footing excavations should be carefully inspected by a geotechnical engineer to verify footings will be placed to bear on firm undisturbed soil at the recommended depth and the excavation is in a dry condition prior to pouring concrete. Eustis Engineering should be contacted to observe the condition within footing excavations prior to concrete placement.

24. Allowable Soil Bearing Values. Analyses have been made to estimate the net allowable soil bearing values for continuous grade beam footing foundations and isolated square footing foundations. The use of these foundations should be restricted to the proposed building to be constructed. A shallow continuous footing foundation, placed to bear at least 24 inches below the existing ground surface and having a width of 1.5 to 3 feet, may be designed for a net allowable soil bearing value of 850 psf. A shallow isolated square footing foundation, placed to bear at least 24 inches below the existing ground surface and having a width of 3 to 5 feet, may be designed for a net allowable soil bearing value of 1,100 psf.

25. Estimated Settlement of Footings. Assuming a long term dead load pressure intensity equal to 80% of the allowable soil bearing value, it is estimated settlement of continuous or spread footings for support of the proposed building will be ½ to 1 inch. This settlement estimate should be considered additive to the settlement estimated for a slab supporting a separate uniform dead load.

26. Our estimate of settlement is based on the following assumptions:

- the center to center spacing between continuous footings is not less than three times the footing width,
- the center to center spacing between adjacent square footings is not less than twice the largest footing side dimension,
- the foundation soils are not degraded or exposed to excess moisture prior to placing concrete for the footings, and
- less than 1 foot of additional fill will be required at the site.

If our assumptions are not met, Eustis Engineering should be notified to reevaluate potential settlement.

Pile Foundations

27. Allowable Pile Load Capacities. Analyses have been made to determine the estimated allowable single pile load capacities for treated ASTM D 25 quality timber piles used in compression and tension to support the proposed building. The results of these analyses are tabulated on Figure 2. Timber

piles should have a minimum tip embedment of 38 feet below the existing ground surface to ensure they are tipped in a medium dense sand layer present below the 36-ft depth.

28. The allowable pile load capacities provide for a 2-ft cutoff below the existing ground surface and contain an estimated factor of safety of 2 against failure of a single pile through the soil. The analyses for pile capacities are based on a soil-pile relationship only. Therefore, the structural capacity of the piles and their connections to transmit these loads should be determined by a structural engineer.

29. Pile Group Capacity and Spacing. Piles firmly seated in sand deposits will derive a significant portion of their supporting capacity through end bearing. Consideration of group effects is not necessary for these piles. The minimum center to center pile spacing within a row or group of piles should be determined in accordance with the pile spacing formula given on Figure 3. The pile spacing and group dimension should also meet the requirements contained in the following paragraphs.

30. Estimated Settlement Due to Structural Loads. We recommend the slab be cast monolithically with pile caps and grade beams to minimize the potential for differential settlements. We estimate settlement of timber piles driven to a minimum tip embedment depth of 38 feet to be to ¼ to ½ inch. This estimate does not include elastic deformation of the piles which should be added to the settlement estimate. Elastic deformation of the piles may be estimated at 67% of the static column strain of a pile acting as a column.

31. Our estimates of settlement are based on the assumption piles will be driven in small groups or widely spaced rows. We have assumed the largest group dimension will be no greater than 20% of the pile length and the center to center spacing between groups will be no closer than twice the largest group dimension. We have assumed the center to center spacing between rows of single piles be no closer than 8 feet. All piles should be driven to the same tip embedment in order to minimize differential foundation settlement. In the event any of our assumptions are not met, Eustis Engineering should be contacted to evaluate the potential settlement of pile foundations.

32. Pile Driving. Close field supervision should be maintained by experienced personnel to ensure proper procedures are followed and accurate records are kept during all pile driving operations. The driving record should include pile type, overall length, tip and butt diameters, embedment below finished grade, and the number of blows per foot of penetration. An accurate driving record is especially important to verify all piles are installed to the required tip embedment and to give an indication of any unusual driving characteristics which may indicate pile breakage.

33. Small treated ASTM D 25 quality timber piles having tip diameters of 6 inches may be driven with a single acting air hammer delivering 7,500 ft-lbs of energy per blow. Larger treated ASTM D 25 quality timber piles having tip diameters of 7 inches or greater may be driven with a single acting air hammer with a manufacturer's rated energy of 15,000 ft-lbs per blow. Piles should be driven to their designated tip embedment or to a maximum of 25 blows per foot in order to minimize structural damage to the piles. Driving

records for piles not reaching their recommended tip embedment should be reviewed by Eustis Engineering.

34. Prepunching or Preaugering. Prepunching or preaugering of stiff surficial fill material may be required to avoid damage to the timber piles. The prepunch or preauger should be no greater than the tip diameter of the pile and should extend no deeper than 5 feet below the existing ground surface. Preaugering may be by dry auger methods.

35. Test Piles and Pile Load Tests. Once the design pile type and length have been selected, it is recommended at least one test pile be driven within the area of the proposed building. The test pile should be installed with equipment and methods which are used to drive the job piles. The test pile should be allowed to set for a period of 14 days and then should be load tested to failure in accordance with ASTM D 1143. The results of the pile load test should be evaluated by Eustis Engineering to verify the estimated pile load capacities.

36. Vibrations. Pile driving will cause vibrations which may affect nearby structures and utilities. Pile driving should be monitored with a seismograph at any structure of concern during the test pile program and driving of the job piles to record their magnitude of vibrations. Peak particle velocities of 0.25 in./sec as measured by the seismograph are generally regarded as a vibration level uncomfortable to human perception. Exceeding peak particle velocities of 0.5 in./sec may induce damage to the structure. If sustained peak particle velocities exceed 0.25 in./sec, Eustis Engineering should be contacted. If

sustained peak particle velocities exceed 0.5 in./sec, pile driving should be terminated and consideration given to altering installation criteria.

Pavement Analysis

37. Traffic. The analyses for the pavement assume relatively light traffic consisting of approximately 100 passenger automobiles with an occasional heavier truck, such as a garbage collection vehicle. Truck traffic will control the design of the pavement. We have assumed one truck twice a week for 20 years or 2,800 repetitions of a 32-kip single axle load. ***Our traffic assumptions should be verified prior to implementation of our pavement recommendations.***

38. Method of Analysis. The pavement components and thicknesses were determined using methods presented in the AASHTO Guide for Design of Pavement Structures. In addition, the resilient soil modulus (M_r) of the subgrade was estimated based on the type of soil, probable drainage conditions and engineering experience. Considering these factors, a design M_r of 3,000 psi was used for the pavement. This value assumes the subgrade is properly drained.

39. Flexible Pavement. Our analyses assume all paving materials will conform to the Louisiana Standard Specifications for Roads and Bridges, 1992 edition (LSSRB). For driveways and serviceways, we recommend a minimum of 4 inches of hot mix asphaltic surface course consisting of at least 2 inches of Type 3 wearing course and 2 inches of Type 3 binder course, 6 inches of

stone base course, 8 inches of sand subbase, and a geotextile fabric beneath the subbase for material separation. For the parking lot, we recommend a minimum of 3 inches of hot mix asphaltic surface course consisting of at least 1.5 inches of a Type 3 wearing course and 1.5 inches of a Type 3 binder course, 6 inches of stone base course, 6 inches of sand subbase, and a geotextile fabric beneath the subbase for material separation.

40. The asphaltic surface course should conform with Section 501 of the LSSRB. The stone base course should be placed and compacted in accordance with Section 302, Class II base course. Sand subbase should follow the recommendations given in "Structural Fill" of this report.

41. Grades should provide for adequate drainage to prevent saturation of the subgrade and base course materials. If the type and thickness of pavement components are changed, Eustis Engineering should be consulted to determine the suitability of these materials and the structural number of the pavement.

42. Rigid Pavement. Using the same soil and traffic conditions, Eustis Engineering recommends rigid pavement for the parking lot be composed of 5 inches of Portland Cement Concrete. Rigid pavement for the driveways and serviceways should be composed of 7 inches of Portland Cement Concrete. The concrete should have a specified 28-day compressive strength of 4,000 psi to give the pavement adequate flexural strength. The concrete should be underlain by at least 6 inches of compacted sand fill placed upon a geotextile fabric. The sand fill should conform with the material and compaction requirements given in "Structural Fill." The sand subbase should be

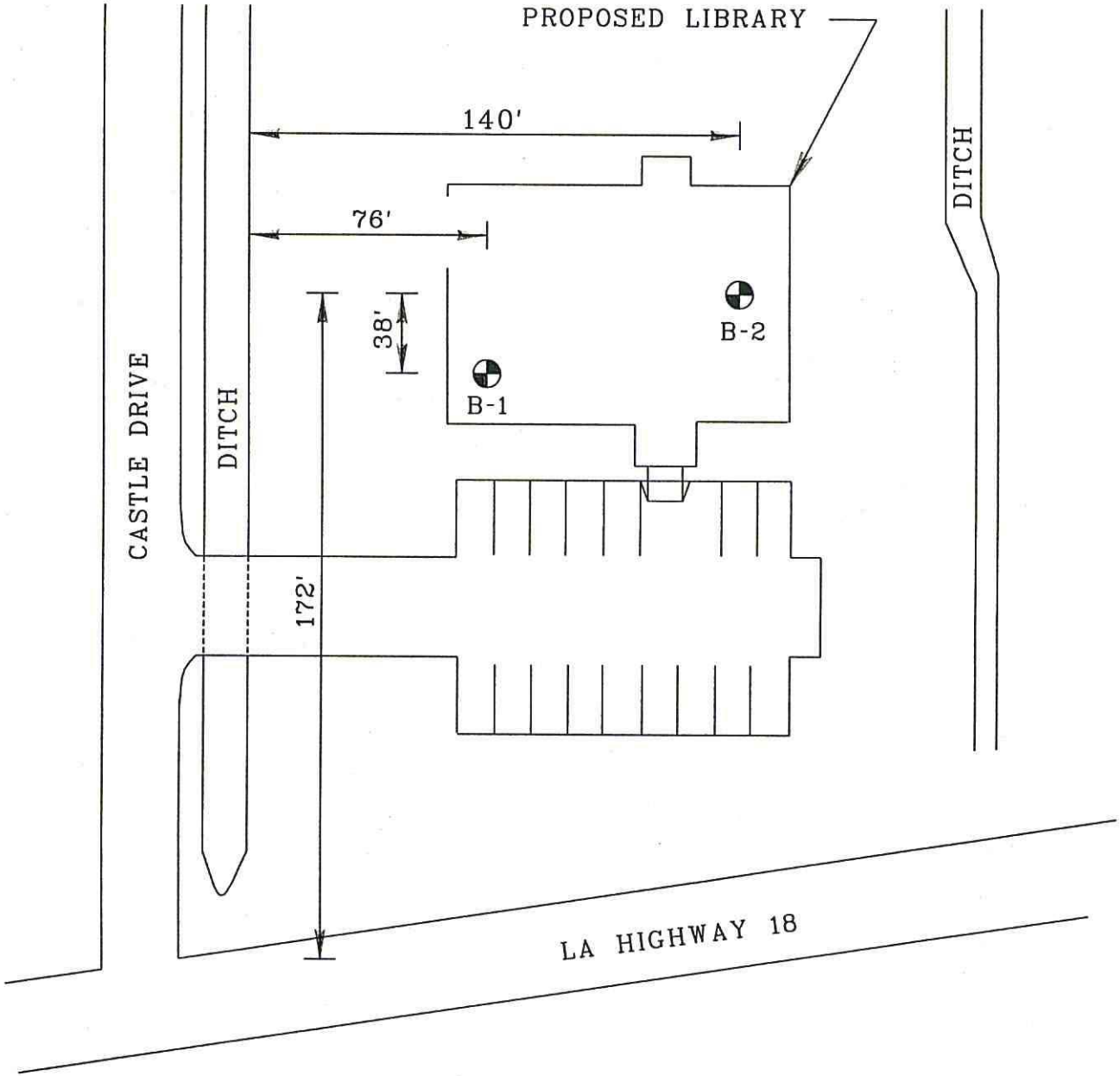
compacted to 95% of its maximum dry density at optimum water content using ASTM D 1557. The geotextile fabric should conform with Class C or D fabric in Section 1019 of the LSSRB.

43. Grades should provide for adequate drainage to prevent saturation of sand fill beneath the pavement. All joints should be sealed to prevent infiltration of water. All pavement details, such as wire mesh, reinforcement, dowels, joints, curbs, etc., should be designed by a pavement design engineer.

ADDITIONAL GEOTECHNICAL SERVICES

44. To provide continuity between the investigation, design, and construction phases, Eustis Engineering should be retained to provide additional services which may include inplace density tests of structural fill, logging of the test piles and job piles, performance of pile load tests, concrete testing and inspection, and any other materials testing services which will provide quality control during construction and conformance to design specifications.

45. In summary, Eustis Engineering should be retained to monitor all geotechnical related work performed by the contractor. This permits the geotechnical engineer to be available quickly, evaluate unanticipated conditions, conduct additional tests if required, and formulate alternative solutions to problems when necessary. This is recommended to avoid construction cost overruns or disputes on the project.



⊕ - BORINGS DRILLED 7 AUGUST 1998

NOT TO SCALE

LOCATION OF BORINGS

ST. JOHN THE BAPTIST PARISH
WEST BANK LIBRARY
EDGARD, LOUISIANA

EUSTIS ENGINEERING COMPANY, INC.

FIGURE 1

ST. JOHN THE BAPTIST PARISH
WEST BANK LIBRARY
EDGARD, LOUISIANA

ALLOWABLE PILE LOAD CAPACITIES
TREATED ASTM D 25 QUALITY TIMBER PILES

SIZE OF PILE	PILE TIP EMBEDMENT BELOW EXISTING GROUND SURFACE IN FEET	ESTIMATED PILE LOAD CAPACITY IN TONS FACTOR OF SAFETY ≈ 2	
		COMPRESSION	TENSION
6-In. Tip 8-In. Butt	38 to 40	8	5
7-In. Tip 12-In. Butt	38 to 40	15	7

CAPACITY OF PILE GROUPS

The maximum allowable load carrying capacity of a pile group is no greater than the sum of the single pile load capacities, but may be limited to a lower value if so indicated by the result of the following formula.

$$Q_a = \frac{P \times L \times c}{(FSF)} + \frac{2.6\, q_u \left(1 + 0.2\, \frac{w}{b}\right) A}{(FSB)}$$

In Which:

Q_a	=	Allowable load carrying capacity of pile group, lb
P	=	Perimeter distance of pile group, ft
L	=	Length of pile, ft
c	=	Average (weighted) cohesion or shear strength of material between surface and depth of pile tip, psf
q_u	=	Average unconfined compressive strength of material in the zone immediately below pile tips, psf (unconfined compressive strength = cohesion x 2)
w	=	Width of base of pile group, ft
b	=	Length of base of pile group, ft
A	=	Base area of pile group, sq ft
(FSF)	=	Factor of safety for the friction area = 2
(FSB)	=	Factor of safety for the base area = 3

The values of c and q_u used in this formula should be based on applicable soil data shown on the Log of Boring and Test Results for this report. In the application of this formula, the weight of the piles, pile caps and mats, considering the effect of buoyancy, should be included.

SPACING WITHIN PILE GROUPS

$$SPAC = 0.05\,(L_1) + 0.025\,(L_2) + 0.0125\,(L_3)$$

In Which:

SPAC	=	Center to center of piles, feet
L_1	=	Pile penetration up to 100 feet
L_2	=	Pile penetration from 101 to 200 feet
L_3	=	Pile penetration beyond 200 feet

NOTE: Minimum pile spacing = 3 feet or 3 pile diameters, whichever is greater

APPENDIX

LEGEND AND NOTES FOR LOG OF BORING AND TEST RESULTS

PP — Pocket penetrometer resistance in tons per square foot

TV — Torvane shear strength in tons per square foot

SPT — Standard Penetration Test. Number of blows of a 140-lb. hammer dropped 30 inches required to drive 2-in O.D., 1.4-in. I.D. sampler a distance of one foot into the soil, after first seating it 6 inches

SPLR — Type of Sampling: Shelby, SPT, Auger, No Sample

SYMBOL — Clay, Silt, Sand, Humus. Predominant type shown heavy; Modifying type shown light

DENSITY — Unit weight in pounds per cubic foot

USC — Unified Soil Classification

TYPE

UC	Unconfined compression shear
OB	Unconsolidated undrained triaxial compression shear on one specimen confined at the approximate overburden pressure
UU	Unconsolidated undrained triaxial compression shear
CU	Consolidated undrained triaxial compression shear
DS	Direct shear
CON	Consolidation
PD	Particle size distribution
k	Coefficient of permeability in centimeters per second
SP	Swelling pressure in pounds per square foot

ϕ — Angle of internal friction in degrees

c — Cohesion in pounds per square foot

Other laboratory test results reported on separate figure

Ground Water Measurements — Initial, Final

GENERAL NOTES

(1) At the time the borings were made, ground water levels were measured below existing ground surface. These observations are shown on the boring logs. However, ground water levels may vary due to seasonal and other factors. If important to construction, the depth to ground water should be determined by those persons responsible for construction, immediately prior to beginning work.

(2) While the individual logs of borings are considered to be representative of subsurface conditions at their respective locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

ST. JOHN THE BAPTIST PARISH
WEST BANK LIBRARY
SECTION 100
EDGARD, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** **Job No.:** 15499 **Date Drilled:** 8/07/98 **Boring:** 1 Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Medium stiff gray silty clay w/roots & shells	CL	1	0-0.5											
	1.20				Medium stiff tan silty clay	CL	2	2-3	26	90	114	UC	--	505					
	0.90				Medium stiff tan clay w/silt pockets	CH	3	5-6	45	74	108	UC	--	590					
	1.00						4	8-9	37	82	112	UC	--	645					
10					Loose gray & brown clayey silt	ML	5	11-12											
	0.20				Soft tan & light brown sandy clay	CL	6	14-15	34	86	116	UC	--	350					
	0.20				Very soft gray sandy clay	CL	7	18-19											
20																			
30																			
40																			
50																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

ST. JOHN THE BAPTIST PARISH
WEST BANK LIBRARY
SECTION 100
EDGARD, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** **Job No.:** 15499 **Date Drilled:** 8/07/98 **Boring:** 2 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests φ	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0	2.10				Very stiff brown & gray silty clay w/roots	CL	1	0-0.5											
	1.90				Stiff brown & tan sandy clay	CL	2	2-3	24	91	113	UC	--	1155					
	1.00				Medium stiff tan & brown clay w/sand pockets	CH	3	5-6	37	80	110	UC	--	655					
	0.80						4	8-9	50	69	103	UC	--	245					
10	1.20				Stiff gray & brown clay w/concretions	CH	5	11-12											
	0.80				Soft gray sandy clay	CL	6	14-15	37	84	116	UC	--	280					
	0.30				w/trace of wood		7	18-19	41	80	112	UC	--	380					
20					Loose gray sandy silt w/clay lenses	ML	8	23-24											
	0.30				Very soft gray sandy clay	CL	9	28-29	41	79	111	UC	--	230					
30	0.70				Medium stiff gray clay w/silty sand lenses & layers	CH	10	33-34											
					Medium dense gray fine sand w/clay layers	SP	11	38-39	30										
40		17			Medium dense gray fine sand		12	40-41											
		6			Loose gray fine sand w/clay layers	SP	13	43-44											
					Medium stiff gray clay w/silty sand layers & lenses	CH													
50	0.60						14	48-49											

Comments:

APPENDIX B

Sizeler Thompson Brown Architects
300 Lafayette Street, Suite 200
New Orleans, LA 70130
Phone: 504-523-6472
Fax: 504-529-1181

www.sizelerthompsonbrown.com

APPENDIX B

FLOORING INSTALLER'S WARRANTY

WHEREAS _____of_____, herein called the "Flooring Installer," has performed flooring and associated work ("work") on the following project:

1. Owner: _____.
2. Address: _____.
3. Building Name/Type: _____.
4. Address: _____.
5. Specification Section Number: _____.
6. Area of Work: _____.
7. Acceptance Date: _____.
8. Warranty Period: _____.
9. Expiration Date: _____.

AND WHEREAS Flooring Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against faulty or defective materials and workmanship for designated Warranty Period.

NOW THEREFORE Flooring Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to b made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a acceptable condition.

This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
   a. act of God;
   b. Failure of flooring system substrate, (not installed by flowing contractor, including cracking, settlement, deterioration, and decomposition;
   c. Activity on flowing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired by Flooring Installer and until

cost and expense thereof have been paid by Owner or by another responsible party so designated.

3. Flooring Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Flooring Installer, including cutting, patching, and maintenance in connection with attachment of other work, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Flooring Installer to perform said alterations, Warranty shall not become null and void unless Flooring Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. Owner shall promptly notify Flooring Installer of observed, known, or suspected defects, or deterioration and shall afford reasonable opportunity for Flooring Installer to inspect work and to examine evidence of such defects, or deterioration.
6. This Warranty is recognized to be the only warranty of Flooring Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of flooring failure. Specifically, this Warranty shall not operate to relieve Flooring Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, 20_____.

Authorized Signature:_____

Name:_____

Title_____

END OF DOCUMENT

APPENDIX C

Sizeler Thompson Brown Architects
300 Lafayette Street, Suite 200
New Orleans, LA 70130
Phone: 504-523-6472
Fax: 504-529-1181

www.sizelerthompsonbrown.com

APPENDIX C
DOCUMENT 01

LETTER FROM DEPARTMENT OF THE ARMY CORPS OF ENGINEERS

A. **Letter from the Department of the Army Corps of Engineers:** This letter from the Department of Army Corps of Engineers, dated November 17, 2015 is provided for the Bidder's use in preparing Bids and does not relieve the Bidders from doing their own investigation to determine the accuracy of the information and the potential affects its contents may have on the Bid and the Work.

B. **THIS LETTER IS NOT PART OF THE CONTRACT DOCUMENTS.**

C. **This letter** may be found following this cover page.

END OF DOCUMENT

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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NEW ORLEANS DISTRICT
P. O. BOX 60267
NEW ORLEANS LA 70160-0267

November 17, 2015

REPLY TO
ATTENTION OF

Operations Division
Operations Manager,
Completed Works

Mr. Robert LeBlanc - President
Board of Commissioners
Lafourche Basin Levee District
Post Office Box 670
Vacherie, Louisiana 70090

Dear Mr. LeBlanc:

We have received a copy of a letter request, addressed to your Board, dated October 15, 2015, from Sizeler Thompson Brown Architects, on behalf of St. John the Baptist Parish Government, concerning permission to construct an addition to the existing Edgard library building approximately 222 feet landward of the right descending Mississippi River levee, vicinity of second order levee station 1898+00, at Edgard, Louisiana, in St. John the Baptist Parish.

We have no objection to your Board's issuance of a permit for the proposed work provided:

a. The work is accomplished in accordance with the above referenced letter and accompanying drawings.

b. All excavation work is performed and backfilled while the stage of the Mississippi River is below elevation +11.0 feet on the Carrollton gage, at New Orleans, Louisiana. Information concerning current river stages may be obtained on our website at www.mvn.usace.army.mil.

c. All open excavations need to be backfilled to natural ground prior to the river stage reaching +11.0 feet on the Carrolton gage, at New Orleans, Louisiana.

d. All pile driving work is performed and completed while the stage of the Mississippi River is below elevation +11.0 feet on the Carrollton gage, at New Orleans, Louisiana.

e. Please note that the applicant should provide written notification to this office of the construction timeline to include the proposed start and end dates. Additionally, please notify this office prior to commencement and upon completion of the work permitted herein.

This letter of no objection is based upon engineering criteria, and no interpretation or comments regarding local laws, zoning, or ordinances concerning property rights, etc., have been made. Additionally, this letter of no objection does not obviate the applicant's requirement to obtain federal, state, or local permits required by law.

If you have any questions, please contact me or Mayra Flores of my office at 504-862-2241 or 504-862-2459, respectively. Additionally, future correspondence concerning this project should reference our Letter of No Objection number 15-782. This will allow us to more easily locate records of previous correspondence, and thus provide a quicker response.

Please furnish this office a copy of your permit if the applicant's proposal is approved by your Board.

Sincerely,

Amy E. Powell

Amy E. Powell
Operations Manager, Completed Works

cc:

CPRA
Sizeler Thompson Brown Architects
Attn: Brian J. Beadle

APPENDIX C
DOCUMENT 02

LETTER FROM THE LAFOURCHE BASIN LEVEE DISTRICT

A. **Letter from the Lafourche Basin Levee District:** This letter from the Lafourche Basin Levee District, dated November 23, 2015 is provided for the Bidder's use in preparing Bids and does not relieve the Bidders from doing their own investigation to determine the accuracy of the information and the potential affects its contents may have on the Bid and the Work.

B. **THIS LETTER IS NOT PART OF THE CONTRACT DOCUMENTS.**

C. **This letter** may be found following this cover page.

END OF DOCUMENT

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RANDY J. TROSCLAIR
Executive Director

Michael McKinney, Sr.
President

Marlin Rogers
Vice President

LBLD

LAFOURCHE BASIN LEVEE DISTRICT

COMMISSIONERS
Leonce Carmouche
Assumption Parish
Joseph Dantin
St. Charles Parish
Stanley Folse
St. James Parish
James P. Jasmin
St. James Parish
Whitney P. Jasmin, Jr.
St. John the Baptist
Robert LeBlanc
Assumption Parish
Russell Loupe
St. Charles Parish
Eric Matherne
St. Charles Parish
Michael McKinney, Sr.
Ascension Parish
Marlin Rogers
St. Charles Parish
Wayne Waguespack
St. James Parish

P.O. Box 670 – 21380 Highway 20
Vacherie, LA 70090
(225)265-7545
1-800-827-7034
FAX: (225) 265-7648

November 23, 2015

Sizeler Thompson Brown Architects
Mr. Brian J. Beadle
330 Lafayette Mail, Suite 200
New Orleans, Louisiana 70130

Re: Request for permission to construct an addition to the existing Edgard library building approximately 222 feet on the protected side of the right descending Mississippi River levee, vicinity second order L.S. 1898+00 at Edgard, Louisiana, St. John the Baptist Parish

Dear Mr. Beadle:

In reference to your request on behalf of St. John the Baptist Parish Government dated October 15, 2015 relative to the above mentioned subject. This letter will certify that the Board of Commissioner for the Lafourche Basin Levee District has no objections to the proposed work as detailed in your letter, provided:

1) The work accomplished is in accordance with the application and drawings dated October 15, 2015. Any changes to the limits of scope of the proposed work must be submitted for additional review. The Levee District must be contacted in writing prior to commencement and at the end of activities.

2) All excavation work is performed and backfilled while the Mississippi River is below elevation + 11.0 feet on the Carrollton gage, at New Orleans, Louisiana. Information regarding current river stages may be obtained at www.mvn.usace.army.mil.

3) That all open excavations need to be backfilled to natural ground prior to river stage reaching elevation +11.0 feet on the Carrolton gage, at New Orleans, Louisiana.

4) All pile driving work is performed and completed while the stage of the Mississippi River is below elevation +11.0 feet on the Carrollton gage, at New Orleans, Louisiana

FURTHER, this letter on no objection does not purport to authorize your entry upon any land, public or private including lands owned by this Board, without first securing from the owner(s) permission to conduct such operations. This letter does not purport to waive the requirements of other governmental and subgovernmental bodies.

RECEIVED
NOV 30 2015
SIZELER THOMPSON
BROWN ARCHITECTS

APPLICANT agrees to indemnify and save grantor harmless from any and all liability, including liability of grantor to applicant to the no objection offered.

APPLICANT further agrees to appear and defend any and all suits instituted against the Board arising out of and/or incident to this letter of no objection and to pay in full any judgment rendered against the Board arising out of and/or incident to this letter of no objection.

Very truly,
Lafourche Basin Levee District

Randy Trosclair KD

Randy Trosclair
Executive Director

klv
cc: Department of the Army
New Orleans, Louisiana

Coastal Protection and Restoration
Baton Rouge, Louisiana