

Tornado Damage Building Repairs and Reconstruction

LAGC Plan Room - North

Project documents obtained from www.CentralBidding.com

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PROJECT MANUAL
FOR

Tornado Damage Building Repairs
And Reconstruction
Dean Lee Research and Extension Center
LSU AgCenter
Alexandria, Louisiana

Owner

STATE OF LOUISIANA
Jeff Landry
Governor

Taylor F. Barras, Commissioner
Division of Administration

Matt Baker, Director
Facility Planning & Control

Project No. 19-607-21-01, F.19002617
State ID: Multiple
Site Code: 6-40-023

Alliance Design Group Job No. 21011

June, 2025 (Revised 3/11/26)

Alliance Design Group
A Professional Architectural Limited Liability Company

WILLIAM A. TUDOR, ARCHITECT
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Lake Charles, LA



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1.1 DESIGN PROFESSIONALS OF RECORD

A. Architect:

1. Alliance Design Group.
2. William Tudor
3. License # 4453
4. Responsible for Divisions 01-13 and 32



B. Plumbing Engineer:

1. EMA Engineering & Consulting, Inc.
2. Thomas Sanders
3. License # 28647
4. Responsible for Divisions 22



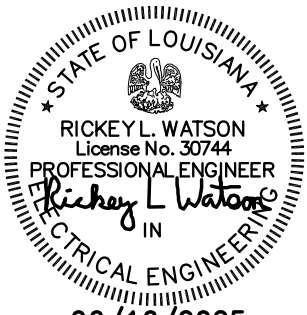
06/16/25

C. HVAC Engineer:

1. EMA Engineering & Consulting, Inc.
2. Thomas Sanders
3. License # 28647
4. Responsible for Divisions 23

D. Electrical Engineer:

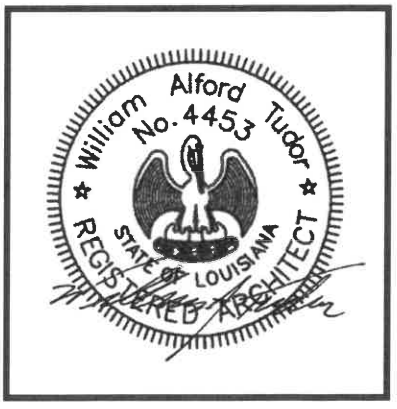
1. EMA Engineering & Consulting, Inc.
2. Rick Watson
3. License # 30744
4. Responsible for Divisions 26-27



06/16/2025

END OF DOCUMENT 000107

DIVISION 00
PROCUREMENT AND CONTRACTING REQUIREMENTS



ADVERTISEMENT FOR BIDS

Sealed bids will be received for the State of Louisiana by the Division of Administration and shall be directed to the Office of Facility Planning and Control, 1201 North Third Street, Claiborne Office Building, Suite 7-160, Baton Rouge, Louisiana, 70802 or P.O. Box 94095, Baton Rouge, Louisiana, 70804-9095. The deadline for receipt of bids is 2:00 PM on **Tuesday, April 21, 2026**, at which time bids will be opened and read aloud in a public meeting in the Claiborne Office Building, Conference Room 1-145.

FOR: **Tornado Damage Building Repairs and Reconstruction**
Dean Lee Research and Extension Center
LSU AgCenter
Alexandria, Louisiana
PROJECT NUMBER: **19-607-21-01, F.19002617**

Complete Bidding Documents for this project are available in electronic form. They may be obtained without charge and without deposit from **Alliance Design Group, LLC**. Printed copies are not available from the Designer but arrangements can be made to obtain them through most reprographic firms. Plan holders are responsible for their own reproduction costs.

Questions about this procedure shall be directed to the Designer at:

Alliance Design Group, LLC
1439 Centre Ct., Suite 401
Alexandria, LA 71301
Telephone: 318-445-3151
E-mail: adg@adgllc.net

All bids shall be accompanied by bid security in an amount of five percent (5.0%) of the sum of the base bid and all alternates. The form of this security shall be as stated in the Instructions to Bidders included in the Bid Documents for this project.

The successful Bidder shall be required to furnish a Performance and Payment Bond written as described in the Instructions to Bidders included in the Bid Documents for this project.

A PRE-BID CONFERENCE WILL BE HELD
at 10:00 AM on Tuesday, April 07, 2026 at
Louisiana State University AgCenter, DeWitt Livestock Facility, 100 Gregg Marshall Drive, Alexandria, LA 71302.

Bids shall be accepted from Contractors who are licensed under LA. R.S. 37:2150-2192 for the classification of **Building Construction**. Bidder is required to comply with provisions and requirements of LA R.S. 38:2212(B)(5). No bid may be withdrawn for a period of forty-five (45) days after receipt of bids, except under the provisions of LA. R.S. 38:2214.

The Owner reserves the right to reject any and all bids for just cause. In accordance with La. R.S. 38:2212(B)(1), the provisions and requirements of this Section and those stated in the bidding documents shall not be waived by any entity.

When this project is financed either partially or entirely with State Bonds or financed in whole or in part by federal or other funds which are not readily available at the time bids are received, the award of this Contract is contingent upon the granting of lines of credit, or the sale of bonds by the Bond Commission or the availability of federal or other funds. The State shall incur no obligation to the Contractor until the Contract Between Owner and Contractor is fully executed.

Facility Planning and Control is a participant in the Small Entrepreneurship (SE) Program (the Hudson Initiative) and the Veteran-Owned and Service-Connected Disabled Veteran-Owned (LaVet) Small Entrepreneurships Program. Bidders are encouraged to consider participation. Information is available from the Office of Facility Planning and Control or on its website at https://www.doa.la.gov/doa/fpc/.

If you have a disability and would like to request an accommodation in order to participate in this meeting, please contact Cheryl Schilling at Cheryl.Schilling@la.gov or (225) 342-6060 as soon as possible but no later than 48 hours before the scheduled meeting.

STATE OF LOUISIANA
DIVISION OF ADMINISTRATION
FACILITY PLANNING AND CONTROL
MATTHEW H. BAKER, DIRECTOR

INSTRUCTIONS TO BIDDERS

COMPLETION TIME:

The Bidder shall agree to fully complete the contract within (240) consecutive calendar days, subject to such extensions as may be granted under Paragraph 8.3, in the General Conditions and the Supplementary Conditions, and acknowledges that this construction time will start on or before the date specified in the written "Notice to Proceed" from the Owner.

LIQUIDATED DAMAGES:

The Bidder shall agree to pay as Liquidated Damages the amount of (Seven Hundred and 00/100) Dollars ($700.00) for each consecutive calendar day for which the work is not complete, beginning with the first day beyond the contract completion date stated on the "Notice to Proceed" or as amended by change order.

TAX EXEMPTION:

The project is to be exempt from sales and use taxes imposed by any taxing authority. The successful contractor / subcontractors will be required to submit the appropriate tax exemption form To apply for Louisiana tax exemption, contractors must have a LaTAP account and be registered for Sales Tax in order to submit the application. The Form R-85012 application can now only be filed electronically through Louisiana Taxpayer Access Point (LaTAP). The application must include the LaGov contract number which can be found on the executed contract, a brief project description, Notice to Proceed (NTP) start and end dates, and an uploaded copy of the executed contract. The following is information to include on the form for the project:

Public Entity: Facility Planning and Control
LDR Sales Tax Account #: N/A

For assistance or questions on this process, contact the following:

LaTAP Questions or Assistance: Call (855) 307 3893 or email Taxpayer.AccessPoint@LA.GOV
Application Process Questions: LDRSales.ExemptionApplications@la.gov
General Sales Tax Questions: Sales.inquiries@la.gov
Exemption Qualification Questions: PolicySales@la.gov
Legal Interpretation Questions: PolicySales@la.gov

ARTICLE 1

DEFINITIONS

1.1 The Bid Documents shall include the following:

Advertisement for Bids
Instructions to Bidders
Bid Form
Bid Bond Form
General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition
Supplementary Conditions
Contract Between Owner and Contractor and Performance and Payment Bond and Non-Collusion Affidavit
Attestations Affidavit – 10 day document
User Documents (if applicable)
Pre-Construction Conference Agenda
Schedule of Values
Change Order Form
Recommendation of Acceptance
Partial Occupancy Form
Building Plaque *(if applicable)*
Asbestos Abatement (if applicable)
Other Documents (if applicable)
Specifications & Drawings
Addenda issued during the bid period to be acknowledged on the Bid Form

1.2 All definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201 and the Supplementary Conditions are applicable to the Bid Documents.

1.3 Addenda are written and/or graphic instruments issued by the Designer prior to the opening of bids, which modify or interpret the Bid Documents by additions, deletions, clarifications, corrections and prior approvals.

1.4 A bid is a complete and properly signed proposal to do the work or designated portion thereof for the

sums stipulated therein supported by data called for by the Bid Documents.

1.5 Base bid is the sum stated in the bid for which the Bidder offers to perform the work described as the base, to which work may be added, or 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 the amount of the base bid if the corresponding change in project scope or materials or methods of construction described in the Bid Documents is accepted.

1.7 A Bidder is one who submits a bid for a prime Contract with the Owner for the work described in the Bid Documents.

1.8 A Sub-bidder is one who submits a bid to a Bidder for materials and/or labor for a portion of the work.

1.9 Where the word "Architect" is used in any of the documents, it shall refer to the Designer of record of the project, regardless of discipline.

ARTICLE 2

PRE-BID CONFERENCE

2.1 A Pre-Bid Conference shall be held at least 10 days before the date for receipt for bids. The Designer shall coordinate the setting of the date, time and place for the Pre-Bid Conference with the User and shall notify, in writing, the Owner and all who have received sets of the Bid Documents to attend. The purpose of the Pre-Bid Conference is to familiarize Bidders with the requirements of the Project and the intent of the Bid Documents, and to receive comments and information from interested Bidders. If the Pre-Bid Conference is stated in the Advertisement for Bids to be a Mandatory Pre-Bid Conference, bids shall be accepted only from those Bidders who attend the Pre-Bid Conference. Bidders who are not in attendance for the **entire** Pre-Bid Conference will be considered to have not attended.

2.2 Any revision of the Bid Documents made as a result of the Pre-Bid Conference shall not be valid unless included in an addendum.

ARTICLE 3

BIDDER'S REPRESENTATION

3.1 Each Bidder by making his bid represents that:

3.1.1 He has read and understands the Bid Documents and his bid is made in accordance therewith.

3.1.2 He has visited the site and has familiarized himself with the local conditions under which the work is to be performed.

3.1.3 His bid is based solely upon the materials, systems and equipment described in the Bid Documents, as advertised and as modified by addenda.

3.1.4 His bid is not based on any verbal instructions contrary to the Bid Documents and addenda.

3.1.5 He is familiar with Code of Governmental Ethics requirement that prohibits public servants and/or their immediate family members from bidding on or entering into contracts; he is aware that the Designer and its principal owners are considered Public Servants under the Code of Governmental Ethics for the limited purposes and scope of the Design Contract with the State on this Project (see Ethics Board Advisory Opinion, No. 2009-378 and 2010-128); and neither he nor any principal of the Bidder with a controlling interest therein has an immediate family relationship with the Designer or any principal within the Designer's firm (see La. R.S. 42:1113). Any Bidder submitting a bid in violation of this clause shall be disqualified and any contract entered into in violation of this clause shall be null and void.

3.2 The Bidder must be fully qualified under any State or local licensing law for Contractors in effect at the time and at the location of the work before submitting his bid. In the State of Louisiana, Revised Statutes 37:2150, et seq. will be considered, if applicable.

The Bidder shall be responsible for determining that all of his Sub-bidders or prospective Subcontractors are duly licensed in accordance with law.

ARTICLE 4

BID DOCUMENTS

4.1 Copies

4.1.1 The Designer shall provide the Bid Documents in electronic format. They may be obtained without charge and without deposit as stated in the Advertisement for Bids.

4.1.2 Printed copies will not be available from the Designer, but arrangements can be made to obtain them through most reprographic firms and/or plan rooms. All plan holders are responsible for their own reproduction costs.

4.1.3 Complete sets of Bid Documents shall be used in preparing bids; neither the Owner nor the Designer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents.

4.1.4 The Owner or Designer in making the Bid Documents available on the above terms, do so only for the purpose of obtaining bids on the work and do not confer a license or grant for any other use.

4.2 Interpretation or Correction of Bid Documents

4.2.1 Bidders shall promptly notify the Designer of any ambiguity, inconsistency or error which they may discover upon examination of the Bid Documents or of the site and local conditions.

4.2.2 Bidders requiring clarification or interpretation of the Bid Documents shall make a written request to the Designer, at least seven days prior to the date for receipt of bids.

4.2.3 Any interpretation, correction or change to the Bid Documents will be made by addendum. Interpretations, corrections or changes to the Bid Documents made in any other manner will not be binding and Bidders shall not rely upon such interpretations, corrections and changes.

4.3 Substitutions

4.3.1 The materials, products and equipment described in the Bid Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. All substitutions shall be in accordance with La. R.S. 38:2212(T)(2).

4.3.2 For closed specifications, when a potential supplier submits a particular product for prior approval other than a product specified in the Bid Documents, said product will not be considered unless written request for approval has been submitted by the Bidder and has been received by the Designer at least fourteen (14) working days prior to the opening of bids. (La. R.S. 38:2295(C)) Each such request 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 model numbers, drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitution would require shall be included. It shall be the responsibility of the Bidder to include in his bid all changes required of the Bid Documents if the proposed product is used. Prior approval, if given, is contingent upon supplier being responsible for any costs which may be necessary to modify the space or facilities needed to accommodate the materials and equipment approved.

4.3.3 If the Designer approves any proposed substitution, such approval shall be set forth in an addendum. Bidders shall not rely upon approvals made in any other manner.

4.4 Addenda

4.4.1 Addenda will be transmitted to all who are known by the Designer to have requested and/or received a complete set of Bid Documents.

4.4.2 Copies of addenda will be made available for inspection wherever Bid Documents are on file for that purpose.

4.4.3 In accordance with La. R.S. 38:2212(O)(2)(b) addenda shall not be issued within a period of seventy-two (72) hours prior to the advertised time for the opening of bids, excluding Saturdays, Sundays, and any other legal holidays. If the necessity arises of issuing an addendum modifying plans and specifications within the seventy-two (72) hour period prior to the advertised time for the opening of bids, then the opening of bids shall be extended at least seven but no more than

twenty-one (21) working days, without the requirement of re-advertising. FPC shall be consulted prior to issuance of such an addendum and shall approve such issuance. The revised time and date for the opening of bids shall be stated in the addendum.

4.4.4 Each Bidder shall ascertain from the Designer prior to submitting his bid that he has received all addenda issued, and he shall acknowledge their receipt on the Bid Form.

4.4.5 The Owner shall have the right to extend the bid date by up to (30) thirty days without the requirement of re-advertising. Any such extension shall be made by addendum issued by the Designer.

ARTICLE 5

BID PROCEDURE

5.1 Form and Style of Bids

5.1.1 Bids shall be submitted on the Louisiana Uniform Public Work Bid Form provided by the Designer for this project.

5.1.2 The Bidder shall ensure that all applicable blanks on the Bid Form are completely and accurately filled in.

5.1.3 Bid sums shall be expressed in both words and figures, and in case of discrepancy between the two, the written words shall govern.

5.1.4 Any interlineation, alteration or erasure must be initialed by the signer of the bid or his authorized representative.

5.1.5 Bidders are cautioned to complete all alternates should such be required in the Bid Form. Failure to submit alternate prices will render the bid non responsive and shall cause its rejection.

5.1.6 Bidders are cautioned to complete all unit prices should such be required in the Bid Form. Unit prices represent a price proposal to do a specified quantity and quality of work. Unit prices are incorporated into the base bid or alternates, as indicated on the Unit Price Form, but are not the sole components thereof.

5.1.7 Bidder shall make no additional stipulations on the Bid Form nor qualify his bid in any other manner.

5.1.8 Written evidence of the authority of the person signing the bid for the public work shall be submitted in accordance with La. R.S. 38:2212(B)(5).

5.1.9 On any bid in excess of fifty thousand dollars ($50,000.00), the Bidder shall certify that he is licensed under La. R.S. 37: 2150-2173 and show his license number on the bid above his signature or his duly authorized representative.

5.2 Bid Security

5.2.1 No bid shall be considered or accepted unless the bid is accompanied by bid security in an amount of five percent (5.0%) of the base bid and all alternates.

The bid security shall be in the form of a certified check or cashier's check drawn on a bank insured by the Federal Deposit Insurance Corporation, or a Bid Bond written by a surety company licensed to do business in Louisiana and signed by the surety's agent or attorney-in-fact. The Bid Bond shall be written on the Facility Planning and Control Bid Bond Form, and the surety for the bond must meet the qualifications stated thereon. The Bid Bond shall include the legal name of the Bidder, be in favor of the State of Louisiana, Division of Administration, Office of FPC, and shall be accompanied by appropriate power of attorney. The Bid Bond must be signed by both the Bidder/principal and the surety in the space provided on the FPC Bid Bond Form. Failure by the Bidder/principal or the surety to sign the Bid Bond shall result in the rejection of the bid.

Bid security furnished by the Bidder shall guarantee that the Bidder will, if awarded the work according to the terms of his proposal, enter into the Contract and furnish Performance and Payment Bonds as required by these Bid Documents, within fifteen (15) days after written notice that the instrument is ready for his signature.

Should the Bidder refuse to enter into such Contract or fail to furnish such bonds, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as penalty.

5.2.2 The Owner will have the right to retain the bid security of Bidders until either (a) the Contract

has been executed and bonds have been furnished, or (b) the specified time has elapsed so that bids may be withdrawn, or (c) all bids have been rejected.

5.3 Submission of Bids

5.3.1 The bid shall be sealed in an opaque envelope. The bid envelope shall be identified on the outside with the name of the project, and the name, address, and license number of the Bidder.
The envelope shall not contain multiple bid forms, and will be received until the time specified and at the place specified in the Advertisement for Bids. It shall be the specific responsibility of the Bidder to deliver his sealed bid to FPC at the appointed place and prior to the announced time for the opening of bids. Late delivery of a bid for any reason, including late delivery by United States Mail, express delivery, or misdirection by any party, shall disqualify the bid.

If the bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "Bid Enclosed" on the face thereof. Such bids shall be sent by Registered or Certified Mail, Return Receipt Requested, addressed to:

Facility Planning and Control,
P. O. Box 94095
Baton Rouge, Louisiana, 70804-9095.

Bids sent by express delivery shall be delivered to:

Facility Planning and Control
Suite 7-160
Claiborne Office Building
1201 North Third Street
Baton Rouge, Louisiana 70802

If the bid is hand delivered, it shall be delivered to:

Facility Planning and Control
Suite 7-160
Claiborne Office Building
1201 North Third Street
Baton Rouge, Louisiana 70802

On the bid opening day, 15 minutes prior to the appointed time for the opening of bids, the bid may be delivered to the Claiborne Conference Room 1-145.

5.3.2 Bids shall be deposited at the designated location prior to the time on the date for receipt of bids indicated in the Advertisement for Bids, or any extension thereof made by addendum. Bids received after the time and date for receipt of bids will be returned unopened.

5.3.3 Bidder shall assume full responsibility for timely delivery at location designated for receipt of bids.

5.3.4 Oral, telephonic or telegraphic bids are invalid and shall not receive consideration. Owner shall not consider notations written on outside of bid envelope which have the effect of amending the bid. Written modifications enclosed in the bid envelope, and signed or initialed by the Contractor or his representative, shall be accepted.

5.4 Modification or Withdrawal of Bid

5.4.1 A bid may not be modified, withdrawn or canceled by the Bidder during the time stipulated in the Advertisement for Bids, for the period following the time and bid date designated for the receipt of bids, and Bidder so agrees in submitting his bid, except in accordance with La. R.S. 38:2214 which states, in part, "Bids containing patently obvious, unintentional, and substantial mechanical, clerical, or mathematical errors, or errors of unintentional omission of a substantial quantity of work, labor, material, or services made directly in the compilation of the bid, may be withdrawn by the contractor if clear and convincing sworn, written evidence of such errors is furnished to the public entity within forty-eight hours of the bid opening excluding Saturdays, Sundays, and legal holidays".

5.4.2 Prior to the time and date designated for receipt of bids, bids submitted early may be modified or withdrawn only by notice to the party receiving bids at the place and prior to the time designated for receipt of bids.

5.4.3 Withdrawn bids may be resubmitted up to the time designated for the receipt of bids provided that they are then fully in conformance with these Instructions to Bidders.

5.4.4 Bid Security shall be in an amount sufficient for the bid as modified or resubmitted.

5.5 Prohibition of Discriminatory Boycotts of Israel

By submitting a bid, the Bidder certifies and agrees that the following information is correct:

In preparing its bid, the Bidder has considered all proposals submitted from qualified, potential subcontractors and suppliers, and has not, in the solicitation, selection, or commercial treatment of any subcontractor or supplier, refused to transact or terminated business activities, or taken other actions intended to limit commercial relations, with a person or entity that is engaging in commercial transactions in Israel or Israel-controlled territories, with the specific intent to accomplish a boycott or divestment of Israel. The Bidder has also not retaliated against any person or other entity for reporting such refusal, termination, or commercially limiting actions. The state reserves the right to reject any bid if this certification is subsequently determined to be false and to terminate any contract awarded based on such a false response.

ARTICLE 6

CONSIDERATION OF BIDS

6.1 Opening of Bids

6.1.1 The properly identified Bids received on time will be opened publicly and will be read aloud, and a tabulation abstract of the amounts of the base bids and alternates, if any, will be made available to Bidders after bid opening at https://www.doa.la.gov/doa/fpc/project-administration-state/construction-bid-advertisements-and-results/

6.2 Rejection of Bids

6.2.1 The Owner shall have the right to reject any or all bids and in particular to reject a bid not accompanied by any required bid security or data required by the Bid Documents or a bid in any way incomplete or irregular.

6.3 Acceptance of Bid

6.3.1 It is the intent of the Owner, if he accepts any alternates, to accept them in the order in which they are listed in the Bid Form. Determination of the Low Bidder shall be on the basis of the sum of the base bid and the alternates accepted. However, the Owner shall reserve the right to accept alternates in any order which does not affect determination of the Low Bidder.

ARTICLE 7

POST-BID INFORMATION

7.1 Submissions

7.1.1 At the Pre-Construction Conference, the Contractor shall submit the following information to the Designer.

7.1.1.1 A designation of the work to be performed by the Contractor with his own forces.

7.1.1.2 A breakdown of the Contract cost attributable to each item listed in the Schedule of Values Form. No payments will be made to the Contractor until this is received.

7.1.1.3 The proprietary names and the suppliers of principal items or systems of material and equipment proposed for the work.

7.1.1.4 A list of names and business domiciles of all Subcontractors, manufacturers, suppliers or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the work. It is the preference of the Owner that, to the greatest extent possible or practical, the Contractor utilize Louisiana Subcontractors, manufacturers, suppliers and labor.

7.1.2 The General Contractor shall be responsible for actions or inactions of Subcontractors and/or material suppliers.

The General Contractor is totally responsible for any lost time or extra expense incurred due to a Subcontractor's or Material Supplier's failure to perform. Failure to perform includes, but is not limited to, a Subcontractor's financial failure, abandonment of the project, failure to make prompt delivery, or failure to do work up to standard. Under no circumstances shall the Owner mitigate the General Contractor's losses or reimburse the General Contractor for losses caused by these events.

7.1.3 The lowest responsive and responsible Bidder shall submit to the Designer and the Owner within ten days after the bid opening a letter/letters from the manufacturer stating that the manufacturer will issue the roof system guarantee complying with the requirements of FPC based on the specified roof system and include the name of the applicator

acceptable to the manufacturer at the highest level of certification for installing the specified roof system. This manufacturer shall be one that has received prior approval or is named in the specifications.

In accordance with La. R.S. 38:2227 [references La. R.S. 38:2212(A)(3)(c)(ii), which has since been renumbered as La. R.S. 38:2212(B)(3)(a)], La. R.S. 38:2212.10 and La. R.S. 23:1726(B) the apparent low Bidder on this project shall submit the completed Attestations Affidavit (Past Criminal Convictions of Bidders, Verification of Employees and Certification Regarding Unpaid Workers Compensation Insurance) form found within this bid package to FPC within 10 days after the opening of bids**.** The Attestations Affidavit may also be submitted in the bid envelope.

ARTICLE 8

PERFORMANCE AND PAYMENT BOND

8.1 Bond Required

8.1.1 The Contractor shall furnish and pay for a Performance and Payment Bond written by a company licensed to do business in Louisiana, which shall be signed by the surety's agent or attorney-in-fact, in an amount equal to 100% of the Contract amount. Surety must be listed currently on the U. S. Department of Treasury Financial Management Service List (Treasury List) as approved for an amount equal to or greater than the contract amount, or must be an insurance company domiciled in Louisiana or owned by Louisiana residents. If surety is qualified other than by listing on the Treasury list, the contract amount may not exceed fifteen percent of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance and may not exceed the amount of $500,000. However, a Louisiana domiciled insurance company with at least an A- rating in the latest printing of the A. M. Best's Key Rating Guide shall not be subject to the $500,000 limitation, provided that the contract amount does not exceed ten percent of policyholders' surplus as shown in the latest A. M. Best's Key Rating Guide nor fifteen percent of policyholders' surplus as shown by surety's most recent financial statements filed with the Louisiana Department of Insurance. The Bond shall be signed by the surety's agent or attorney-in-fact. The Bond shall be in favor of the State of Louisiana, Office of Facility Planning and Control.

8.2 Time of Delivery and Form of Bond

8.2.1 The Contractor shall deliver the required bond to the Owner simultaneous with the execution of the Contract.

8.2.2 Bond shall be in the form furnished by FPC, Entitled Contract Between Owner And Contractor And Performance And Payment Bond, a copy of which is included in the Bid Documents.

8.2.3 The Contractor shall require the Attorney-in-Fact who executes the required bond on behalf of the surety to affix thereto a certified and current copy of his power of Attorney.

ARTICLE 9

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

9.1 Form to be Used

9.1.1 Form of the Contract to be used shall be furnished by FPC, an example of which is bound in the Bid Documents.

9.2 Award

9.2.1 After award of the Contract and prior to Contract execution, the successful Bidder, if a corporation, shall have on file with the Louisiana Secretary of State, a Disclosure of Ownership Affidavit, in accordance with La. R.S. 12:1-1622, 12:205(C) and 12:304(A)(11).

9.2.2 In accordance with Louisiana Law, when the Contract is awarded, the successful Bidder shall, at the time of the signing of the Contract, execute the Non-Collusion Affidavit included in the Contract Documents

9.2.3 When this project is financed either partially or entirely with State Bonds, the award of this Contract is contingent upon the sale of bonds by the State Bond Commission. The State shall incur no obligation to the Contractor until the Contract Between Owner and Contractor is duly executed.

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: State of Louisiana,
Office of Facility Planning and Control
1201 North Third Street, Suite 7-160
Baton Rouge, Louisiana 70802
P.O. Box 94095
Baton Rouge, Louisiana 70804
(Owner to provide name and address of owner)

BID FOR: Tornado Damage Building Repairs and Reconstruction
Dean Lee Research and Extension Center
LSU AgCenter, Alexandria, Louisiana
Project No. 19-607-21-01, F.19002617
(*Owner to provide name of project and other identifying information)*

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: Alliance Design Group, LLC, 1439 Centre Court, Ste 401, Alexandria, Louisiana 71301 and dated: June, 2025
(Owner to provide name of entity preparing bidding documents.)

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 Add – All work associated with fans & parking lot lights as per Sheet A110 for the lump sum of:

_____Dollars ($ _____)

Alternate No. 2 Add – All work associated with dirt work as per Sheet A100 for the lump sum of:

_____Dollars ($ _____)

Alternate No. 3 *(Owner to provide description of alternate and state whether add or deduct)* 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 FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM:

* 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.

**** A CORPORATE RESOLUTION OR WRITTEN EVIDENCE** of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5).

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

BID BOND

FOR

FACILITY PLANNING AND CONTROL PROJECTS

Date: _____

KNOW ALL MEN BY THESE PRESENTS:

That_____of_____, as Principal, and_____, as Surety, are held and firmly bound unto the State of Louisiana, Division of Administration, Office of Facility Planning and Control (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)

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

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

Phase 2 Tornado Damage Building Repairs & Reconstruction
Dean Lee Research and Extension Center LSU Ag
Alexandria, Louisiana

THE OWNER:
(Name, legal status and address)

State of Louisiana Facility Planning and Control

P.O. Box 94095
Baton Rouge, Louisiana 70804-9095

THE ARCHITECT:
(Name, legal status and address)

Alliance Design Group,
Limited Liability Company
1439 Centre Court, Ste 401
Alexandria, Louisiana 71301

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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 or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal 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.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 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.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is

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otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

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ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as 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 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 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain 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.

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

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the

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accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

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

§ 2.3.6 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.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's 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 its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design

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professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear

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and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

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

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not

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in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (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 notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner 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 and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

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§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 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.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

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§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 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, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

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

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

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ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

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

§ 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.

§ 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 promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the 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 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as

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required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will 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's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. 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.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the

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Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

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

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

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

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

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§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has 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 notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

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

§ 7.2 Change Orders

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§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

.1 The change in the Work;

.2 The amount of the adjustment, if any, in the Contract Sum; and

.3 The extent of the adjustment, if any, in the Contract Time.

§ 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; or

.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine 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 the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;

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

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

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

.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual 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.

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§ 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.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

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

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

§ 8.2 Progress and Completion

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

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 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.

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ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

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

§ 9.2 Schedule of Values

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

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

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§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and 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 suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

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

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on

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account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive 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. 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.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and

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insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

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

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

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. 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, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance 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 the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 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,

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the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

.1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
.2 failure of the Work to comply with the requirements of the Contract Documents;
.3 terms of special warranties required by the Contract Documents; or
.4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

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

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

.1 employees on the Work and other persons who may be affected thereby;
.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

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

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

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§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance 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 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 notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 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.

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

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

§ 10.3.6 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 reimburse 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.

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ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

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

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

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

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§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the 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 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

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, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

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§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor 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 2.5.

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

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

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

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 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 an assignment without such consent, that party shall

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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 the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the 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 tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

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

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties 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.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

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

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.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has 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' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the 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 under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

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.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 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 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 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.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

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§ 15.1.5 Claims for Additional Cost
If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time
§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages
The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision
§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. 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. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker 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 Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker 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 Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker 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 the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

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§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, 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 receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, 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.

§ 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, 9.10.5, and 15.1.7, shall 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 binding dispute resolution proceedings 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 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 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, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 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. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. 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

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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 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party 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 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party 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.

§ 15.4.4.3 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 those of the Owner and Contractor under this Agreement.

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SUPPLEMENTARY CONDITIONS

These Supplementary Conditions modify, change, delete from or add to the General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition. Where any Article of the General Conditions is modified or any Section, Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Section, Article, Paragraph, Subparagraph or Clause shall remain in effect.

Articles, Sections, Paragraphs, Subparagraphs or Clauses modified or deleted have the same numerical designation as those occurring in the General Conditions.

ARTICLE 1

GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1. The Contract Documents

In Section 1.1.1 delete the third sentence, and add the following sentence:
The Contract Documents shall include the Bid Documents as listed in the Instructions to Bidders and any modifications made thereto by addenda.

1.1.8 Initial Decision Maker

Delete all after the words, "shall not show partiality to the Owner or Contractor".

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE [REFER TO *La R.S. 38:2317*]

1.5.1 Delete the first sentence of the paragraph.

1.5.1 In the third sentence: delete the remainder after the word "publication".

1.7 DIGITAL DATA USE AND TRANSMISSION

In the first sentence after the words, "in digital form" delete ". The parties will use AIA Document E203 2013, Building Information Modeling and Digital Data Exhibit".

1.8 BUILDING INFORMATION MODELS USE AND RELIANCE

Delete Section 1.8.

ARTICLE 2

OWNER

2.2 EVIDENCE OF THE OWNER'S FINANCIAL ARRANGEMENTS

Delete Section 2.2.

2.3 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.3.1 In the first sentence, delete: all before "the Owner shall secure…"

Delete Section 2.3.2 and substitute the following:

2.3.2 The term Architect, when used in the Contract Documents, shall mean the prime Designer (Architect, Engineer, or Landscape Architect), or his authorized representative, lawfully licensed to practice architecture, engineering, or landscape architecture in the State of Louisiana, identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number.

2.3.3 Delete the words: "to whom the Contractor has no reasonable objection and".

ARTICLE 3

CONTRACTOR

3.4 LABOR AND MATERIALS

3.4.2 Delete Section 3.4.2.

Delete Section 3.4.3 and substitute with the following:

3.4.3 Contractor and its employees, officers, agents, representatives, and Subcontractors shall conduct themselves in an appropriate and professional manner, in accordance with the Owner's requirements, at all times while working on the Project. Any such individual who behaves in an inappropriate manner or who engages in the use of inappropriate language or conduct while on Owner's property, as determined by the Owner, shall be removed from the Project at the Owner's request. Such individual shall not be permitted to return without the written permission of the Owner. The Owner shall not be responsible or liable to Contractor or any Subcontractor for any additional costs, expenses, losses, claims or damages incurred by Contractor or its Subcontractor as a result of the removal of an individual from the Owner's property pursuant to this Section. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

3.5 WARRANTY

3.5.2 Replace reference to "Section 9.8.4" with "Section 9.8.6".

3.6 TAXES

Delete Section 3.6 and substitute with the following:

The project is to be exempt from sales and use taxes imposed by any taxing authority. The successful contractor / subcontractors will be required to submit the

appropriate tax exemption form R-85012-T (Public Projects Contractor / Subcontractor: Sales Tax Certification and Exemption Application – Louisiana Revised Statute 47:305.7(A)(1)(b)) to the Louisiana Department of Revenue for each contract / subcontract associated with the work.

3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS (La R.S. 40:1724[A])

3.7.1 Delete Section 3.7.1.

3.7.2 In Section 3.7.2, replace the word "public" with the word "State".

Delete Section 3.7.5 and substitute the following:

3.7.5 If, during the course of the Work, the Contractor discovers human remains, unmarked burial or archaeological sites, burial artifacts, or wetlands, which are not indicated in the Contract Documents, the Contractor shall follow all procedures mandated by State and Federal law, including but not limited to La R.S. 8:671 et seq., the Office of Coastal Protection and Restoration, and Sections 401 & 404 of the Federal Clean Water Act. Request for adjustment of the Contract Sum and Contract Time arising from the existence of such remains or features shall be submitted in writing to the Owner pursuant to the Contract Documents.

3.8 ALLOWANCES

Delete Sections 3.8.1, 3.8.2, and 3.8.3 in their entirety and add the following new Section 3.8.1:

3.8.1 Allowances shall not be made on any of the Work.

3.9 SUPERINTENDENT

3.9.1 Add the following to the end of the paragraph:
Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

3.10 CONTRACTOR'S CONSTRUCTION AND SUBMITTAL SCHEDULES

3.10.1 Add the following: For projects with a contract sum greater than $1,000,000.00, the Contractor shall include with the schedule, for the Owner's and Architect's information, a network analysis to identify those tasks which are on the critical path, i.e., where any delay in the completion of these tasks will lengthen the project timescale, unless action is taken. A revised schedule shall be submitted with each Application and Certificate for Payment. No payment shall be made until this schedule is received.

3.10.3 In the first sentence, delete the word "general".

After the first sentence, add the following:
If the Work is not on schedule, as determined by the Architect, and the Contractor fails to take action to bring the Work on schedule, then the Contractor shall be deemed in default under this Contract and the progress of the Work shall be deemed unsatisfactory.

Such default may be considered grounds for termination by the Owner for cause in accordance with Section 14.2.

Add the following Sections:

3.10.4 Add the following: Submittal by the contractor of a schedule or other documentation showing a completion date for his Work prior to the completion date stated in the contract shall not impose any obligation or responsibility on the Owner or Architect for the earlier completion date.

3.10.5 In the event the Owner employs a commissioning consultant, the Contractor shall cooperate fully in the commissioning process and shall require all subcontractors and others under his control to cooperate. The purpose of such services shall be to ensure that all systems perform correctly and interactively according to the provisions of the Contract Documents.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

Add the following: This requirement is of the essence of the contract. The Architect shall determine the value of these documents and this amount shall not be approved for payment to the Contractor until all of the listed documents are delivered to the Architect in good order, completely marked with field changes and otherwise complete in all aspects.

ARTICLE 4

ARCHITECT

4.2 ADMINISTRATION OF THE CONTRACT

4.2.1 In the first sentence, delete the phrase: "the date the Architect issues the final Certificate for Payment" and replace with the phrase "final payment is due, and with the Owner's concurrence, from time to time during the one year period for correction of Work described in Section 12.2."

4.2.2 In the first sentence, after the phrase: "become generally familiar with"; insert the following: "and to keep the Owner informed about".

In the first sentence, after the phrase "portion of the Work completed", insert the following: "to endeavor to guard the Owner against defects and deficiencies in the Work,"

4.2.4 In the first sentence, delete all after "The Owner and Contractor", and add the following "may communicate directly with each other, when deemed necessary by the Owner, and the Owner will notify the Architect of any decision."

4.2.10 Add the following sentence to the end of Section 4.2.10: There shall be no restriction on the Owner having a Representative.

4.2.11 Add the following sentence to the end of Section 4.2.11:

If no agreement is made concerning the time within which interpretation required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them.

4.2.14 Insert the following sentence between the second and third sentences of Section 4.2.14:

If no agreement is made concerning the time within which interpretation required of the Architect shall be furnished in compliance with this Section 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretation until 15 days after written request is made for them.

ARTICLE 5

SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

Delete Section 5.2.1, and substitute the following:

5.2.1 Unless otherwise required by the Contract Documents, the Contractor shall furnish at the Pre-Construction Conference, to the Owner and the Architect, in writing, the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. No Contractor payments shall be made until this information is received.

Delete Section 5.2.2, and substitute the following:

5.2.2 The Contractor shall be solely responsible for selection and performance of all subcontractors. The Contractor shall not be entitled to claims for additional time and/or an increase in the contract sum due to a problem with performance or nonperformance of a subcontractor.

Delete Sections 5.2.3 and 5.2.4 and substitute the following:

5.2.3 The Contractor shall notify the Architect and the Owner when a subcontractor is to be changed and substituted with another subcontractor.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

Delete Sections 5.4, 5.4.1, 5.4.2 and 5.4.3

ARTICLE 7

CHANGES IN THE WORK

7.1 GENERAL

Add the following Sections:

7.1.4 As part of the pre-construction conference submittals, the Contractor shall submit the following prior to the Contractor's initial request for payment:

7.1.4.1 Fixed job site overhead cost itemized with documentation to support daily rates.

7.1.4.2 Bond Premium Rate with supporting information from the General Contractor's carrier.

7.1.4.3 Labor Burden by trade for both Subcontractors and General Contractor. The Labor Burden shall be supported by the Worker's Compensation and Employer's Liability Insurance Policy Information Page. Provide for all trades.

7.1.4.4 Internal Rate Charges for all significant company owned equipment.

7.1.5 If the General Contractor fails to submit the aforementioned documentation as part of the pre-construction submittals, then pay applications shall not be processed until such time as the Owner receives this information.

7.2 CHANGE ORDERS

Delete Section 7.2.1, and substitute the following Sections:

7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, the Architect, and the Contractor issued after execution of the Contract, authorizing a change in the Work and/or an adjustment in the Contract Sum and/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 or the Contract Time. Any reservation of rights, stipulation, or other modification made on the change order by the contractor shall have no effect.

7.2.2 "Cost of the Work" for the purpose of Change Orders shall be the eligible costs required to be incurred in performance of the Work and paid by the Contractor and Subcontractors which eligible costs shall be limited to:

7.2.2.1 Actual wages paid directly to labor personnel, with a labor burden markup exclusively limited to applicable payroll taxes, worker's compensation insurance, unemployment compensation, and social security taxes for those labor personnel performing the Work. Wages shall be the basic hourly labor rate paid an employee exclusive of fringe benefits or other employee costs. The labor burden percentage for the "Cost of the Work" is limited to categories listed herein. Employer-provided health insurance, fringe benefits, employee training (whether a requirement of employment or not), vacation pay, etc., are examples of ineligible labor burden costs which ***shall not*** be included, as these costs are already compensated by the Overhead and Profit markup.

Supervision shall not be included as a line item in the "Cost of the Work", except when the change results in a documented delay in the critical path, as described in Section 7.2.7.

7.2.2.2 Cost of all materials and supplies necessary and required to perform the Work, identifying each item and its individual cost, including taxes. Incidental consumables are not eligible costs and shall not be included.

7.2.2.3 Cost of each necessary piece of machinery and equipment required to perform the Work, identifying each item and its individual cost, including taxes. Incidental small tools of a specific trade (i.e., shovels, saws, hammers, air compressors, etc.,) and general use vehicles, such as pickup trucks even for moving items around the site, fuel for these general use vehicles, travel, lodging, and/or meals are not eligible and shall not be included.

7.2.2.4 Eligible Insurance costs shall be limited to documented increases in "Builder's Risk" insurance premium / costs only. Commercial General Liability, Automobile Liability, and all other required insurances, where referenced in the Contract shall be considered part of normal overhead. These costs are already compensated by the Overhead and Profit markup.

7.2.2.5 Cost for the General Contractor Performance and Payment Bond premium, where the documented cost of the premiums have been increased due to the Change Order.

7.2.3 Overhead and Profit - The Contractor and Subcontractor shall be due home office fixed overhead and profits on the Cost of the Work, but shall not exceed a total of 16% of the direct cost of any portion of Work.

The credit to the Owner resulting from a change in the Work shall be the sum of those items above, including overhead and profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit shall be computed for credits to the Owner and extras to the Contractor. The Owner shall receive full credit for the computed overhead and profit on credit change order items.

7.2.4 The cost to the Owner resulting from a change in the Work shall be the sum of: Cost of the Work (as defined at Section 7.2.2) and Overhead and Profit (as defined at Section 7.2.3), and shall be computed as follows:

7.2.4.1 When all of the Work is General Contractor Work; 8% markup on the Cost of the Work.

7.2.4.2 When the Work is all Subcontract Work; 8% markup on the Cost of the Work for Subcontractor's Overhead and Profit, plus 8% markup on the Cost of the Work, not including the Subcontractor's Overhead and Profit markup, for General Contractor's Overhead and Profit.

7.2.4.3 When the Work is a combination of General Contractor Work and Subcontract Work; that portion of the direct cost that is General Contract Work shall be

computed per Section 7.2.4.1 and that portion of the direct cost that is Subcontract Work shall be computed per Section 7.2.4.2.

Premiums for the General Contractor's bond may be included, but after the markup is added to the Cost of the Work.
Premiums for the Subcontractor's Bond shall not be included.

7.2.4.4 Subcontract cost shall consist of the items in Section 7.2.2 above plus Overhead and Profit as defined in Section 7.2.3.

7.2.5 Before a Change Order is prepared, the Contractor shall prepare and deliver to the Architect the following information concerning the Cost of the Work, not subject to waiver, within a reasonable time after being notified to prepare said Change Order:

A detailed, itemized list of labor, material and equipment costs for the General Contractor's Work including quantities and unit costs for each item of labor, material and equipment.

An itemized list of labor, material and equipment costs for each Subcontractor's and/or Sub-Subcontractor's Work including quantities and unit costs for each item of labor, material and equipment.

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

7.2.7 Extended fixed job-site costs are indirect costs that are necessary to support the work in the field. Examples of fixed job-site costs are field office rental, salaries of field office staff, field office utilities, and telephone.

Extended fixed job-site costs or equitable adjustment may be included in a Change Order due to a delay in the critical path, with the exception of weather related delays. In the event of a delay in the critical path, the Contractor shall submit all changes or adjustments to the Contract Time **within twenty-one (21) days** of the event giving rise to the delay. The Contractor shall submit documentation and justification for the adjustment by performing a critical path analysis of its most recent schedule in use prior to the change, which shows an extension in critical path activities.

The Contractor shall notify the Architect in writing that the Contractor is making a claim for extended fixed job-site overhead as required by Section 15.1.2. The Contractor shall provide proof that the Contractor is unable to mitigate financial damages through Alternate Work within this Contract or replacement work. "Replacement Work" is that work which the Contractor is obligated to perform under any construction contract separate from this Contract. Reasonable proof shall be required by the Architect that the delays affected the Completion Date.

7.2.8 "Cost of the Work" whether General Contractor cost or Subcontractor cost shall not apply to the following:

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

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

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

7.2.8.4 Cost of supervision refer to section 7.2.2.1, with exception as provided in Section 7.2.7.

7.2.9 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

7.3.3 In the first sentence after "following methods" insert: ", but not to exceed a specified amount".

7.3.4 From .1 of the list, delete all after "Costs of labor, including" and substitute the following "social security, old age and employment insurance, applicable payroll taxes, and workers' compensation insurance;"

Delete the following from .4 of the list: "permit fees,"

Delete Section 7.3.9 and substitute the following:

7.3.9 Pending final determination of the total costs of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs.

ARTICLE 8

TIME

8.1 DEFINITIONS

Add the following:

8.1.5 The Contract Time shall not be changed by the submission of a schedule that shows an early completion date unless specifically authorized by change order.

8.2 PROGRESS AND COMPLETION

Add to Section 8.2.1 the following:

Completion of the Work must be within the Time for Completion stated in the Agreement, subject to such extensions as may be granted under Section 8.3. The Contractor agrees to commence Work not later than fourteen (14) days after the transmittal date of Written Notice to Proceed from the Owner and to substantially complete the project within the time stated in the Contract. 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 and liquidated damages for each consecutive calendar day (Saturdays, Sundays and holidays included) of delay until the Work is substantially complete. The Owner shall be entitled to the sum stated in the Contract Documents. Such Liquidated Damages shall be withheld by the Owner from the amounts due the Contractor for progress payments.

Delete Section 8.2.2.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 In the first sentence after the words "Owner pending" delete the words "mediation and binding dispute resolution" and add the word "litigation", and delete the last word "determine" and add the following: "recommend, subject to Owner's approval of Change Order. If the claim is not made within the limits of Article 15, all rights for future claims for that month are waived."

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

Delete Section 9.1.2.

Delete Section 9.2 and substitute the following:

9.2 SCHEDULE OF VALUES

At the Pre-Construction Conference, the Contractor shall submit to the Owner and the Architect a Schedule of Values prepared as follows:

9.2.1 The attached Schedule of Values Format shall be used. If applicable, the cost of Work for each section listed under each division, shall be given. The cost for each section shall include Labor, Materials, Overhead and Profit.

9.2.2 The Total of all items shall equal the Total Contract Sum. This schedule, when approved by the Architect, shall be used as a basis for the Contractor's Applications for Payment and it may be used for determining the cost of the Work in deductive change orders, when a specific item of Work listed on the Schedule of Values is to be removed. Once the Schedule of Values is submitted at the Pre-Construction Conference, the schedule shall not be modified without approval from the Owner and Architect.

9.3 APPLICATIONS FOR PAYMENT

Delete Sections 9.3.1, 9.3.1.1, and 9.3.1.2 and substitute the following:

9.3.1 Monthly, the Contractor shall submit to the Architect a Facility Planning and Control – Application and Certification for Payment form, supported by any additional data substantiating the Contractor's right to payment as the Owner or the Architect may require. 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 follows, per La R.S. 38:2248:

9.3.1.1 Projects with Contract price up to $500,000.00 – 10% of the Contract price.

9.3.1.2 Projects with Contract price of $500,000.00, or more – 5% of the Contract price.

9.3.1.3 No payment shall be made until the revised schedule required by Section 3.10.1 is received.

9.3.1.4 The normal retainage shall not be due the Contractor until after substantial completion and expiration of the forty-five day lien period and submission to the Architect of a clear lien certificate, consent of surety, and invoice for retainage.

Delete Section 9.3.2 and substitute the following:

9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. Payments for materials or equipment 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.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Section 9.5.1.7: Delete the word "repeated".

Delete Section 9.5.4.

9.6 PROGRESS PAYMENTS

Delete Section 9.6.1 and substitute the following:

9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment within twenty days except for projects funded fully or in part by a Federal reimbursement program. For such projects the Owner will make payment in a timely manner consistent with reimbursement.

9.6.2 Delete the phrase: "no later than seven days" from the first sentence.

After the end of the second sentence, add the following:

La R.S. 9:2784 (A) and (C) require a Contractor or Subcontractor to make payment due to each Subcontractor and supplier within fourteen (14) consecutive days of the receipt of payment from the Owner. If not paid, a penalty in the amount of ½ of 1% per day is due, up to a maximum of 15% from the expiration date until paid. The contractor or subcontractor, whichever is applicable, is solely responsible for payment of a penalty.

9.6.4 Delete the first two sentences of Section 9.6.4 and add the following to the end of the Section:

Pursuant to La. R.S. 38:2242 and La. R.S. 38:2242.2, when the Owner receives any claim of nonpayment arising out of the Contract, the Owner shall deduct 125% of such claim from the Contract Sum. The Contractor, or any interested party, may deposit security, in accordance with La. R.S. 38:2242.2, guaranteeing payment of the claim with the recorder of mortgages of the parish where the Work has been done. When the Owner receives original proof of such guarantee from the recorder of mortgages, the claim deduction will be added back to the Contract Sum.

Delete Section **9.7 FAILURE OF PAYMENT**.

Delete Section 9.8 and substitute the following:

9.8 SUBSTANTIAL COMPLETION

9.8.1 Substantial Completion is the stage in the progress of the Work when the Work is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The Architect shall determine if the project is substantially complete in accordance with this Section.

9.8.2 When the Contractor considers that the Work 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 shall make an inspection to determine whether the Work is substantially complete. A prerequisite to the Work being considered as substantially complete is the Owner's receipt of the executed Roofing Contractor's and Roofing Manufacturer's guarantees, where roofing Work is part of the Contract. Prior to inspection by the Architect, the Contractor shall notify the Architect that the project is ready for inspection by the State Fire Marshal's office. 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 for its intended use, the Contractor shall, before the Work can be considered as Substantially Complete, 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.

9.8.4 When the Architect determines that the project is Substantially Complete, he shall prepare a punch list of exceptions and the dollar value related thereto. The monetary

value assigned to this list will be the sum of the cost estimate for each particular item of Work the Architect develops based on the mobilization, labor, material and equipment costs of correcting the item and shall be retained from the monies owed the contractor, above and beyond the standard lien retainage. The cost of these items shall be prepared in the same format as the schedule of values. At the end of the forty-five day lien period payment shall be approved for all punch list items completed up to that time. After that payment, none of the remaining funds shall be due the contractor until all punch list items are completed and are accepted by the Architect. If the dollar value of the punch list exceeds the amount of funds, less the retainage amount, in the remaining balance of the Contract, then the Project shall not be considered as substantially complete. If funds remaining are less than that required to complete the Work, the Contractor shall pay the difference.

9.8.5 When the preparation of the punch list is complete the Architect shall prepare a Recommendation of Acceptance incorporating the punch list and submit it to the Owner. Upon approval of the Recommendation of Acceptance, the Owner may issue a Notice of Acceptance of Building Contract which shall establish the Date of Substantial Completion. The Contractor shall record the Notice of Acceptance with the Clerk of Court in the Parish in which the Work has been performed. If the Notice of Acceptance has not been recorded seven (7) days after issuance, the Owner may record the Acceptance at the Contractor's expense. All additive change orders must be processed before issuance of the Recommendation of Acceptance. The Owner shall not be responsible for payment for any Work associated with change orders that is not incorporated into the contract at the time of the Recommendation of Acceptance.

9.8.6 Warranties required by the Contract Documents shall commence on the date of Acceptance 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 end of the forty-five (45) day lien period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within forty-five (45) days after notification, the Surety has not completed the punch list, through no fault of the Architect or Owner, the Owner may, at his option, contract to have the balance of the Work completed and pay for such Work with the unpaid funds remaining in the Contract sum. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future state contracts. If the surety fails to complete the punch list within the stipulated time period, the Owner may not accept bonds submitted, in the future, by the surety.

9.9 PARTIAL OCCUPANCY OR USE

Delete Section 9.9.1 and substitute the following:

9.9.1 Partial Occupancy is that stage in the progress of the Work when a designated portion of the Work is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the designated portion of the Work for its intended use. The

Owner may occupy or use any substantially completed portion of the Work so designated by separate agreement with the Contractor and authorized by public authorities having jurisdiction over the Work. Such occupancy or use may commence provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers the designated portion substantially complete the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld.

9.10 FINAL COMPLETION AND FINAL PAYMENT

Delete Section 9.10.4 and replace with the following:

9.10.4 The making of final payment shall not constitute a waiver of Claims by the Owner for the following:

9.10.4.1 Claims, security interests, or encumbrances arising out of the Contract and unsettled;

9.10.4.2 failure of the Work to comply with the requirements of the Contract Documents irrespective of when such failure is discovered;

9.10.4.3 terms of special warranties required by the Contract Documents; or

9.10.4.4 audits performed by the Owner, after final payment.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.2 In the first sentence, between the words: “bearing on” and “safety”, add the words: “the health and,”

10.3 HAZARDOUS MATERIALS

10.3.1 In the second sentence after (PCB) add: “or lead”.

10.3.2 After the first sentence, delete all remaining sentences.

Add at the end: “The Contract time shall be extended appropriately.”

Delete Section 10.4 and substitute the following:

10.4 EMERGENCIES

In an emergency affecting the safety of persons or property, the Contractor shall notify the Owner and Architect immediately of the emergency, simultaneously acting at his discretion to prevent damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency Work shall be determined as provided in Article 15 and Article 7.

ARTICLE 11

INSURANCE AND BONDS

AIA A101 – 2017 Exhibit A is not a part of these documents. Delete all of Sections 11.1, 11.2, 11.3, 11.4, and 11.5, and substitute the following:

INSURANCE REQUIREMENTS FOR NEW CONSTRUCTION, ADDITIONS AND RENOVATIONS

11.1 CONTRACTOR'S LIABILITY INSURANCE

The Contractor shall purchase and maintain without interruption for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the Contractor, its agents, representatives, employees or subcontractors. The duration of the contract shall be from the inception of the contract until the date of final payment.

11.2 MINIMUM SCOPE AND LIMITS OF INSURANCE

11.2.1 Worker's Compensation

Worker's Compensation insurance shall be in compliance with the Worker's Compensation law of the Contractor's headquarters. Employers Liability is included with a minimum limit of $1,000,000 per accident/per disease/per employee. If Work is to be performed over water and involves maritime exposure, applicable LHWCA, Jones Act or other maritime law coverage shall be included. A.M. Best's insurance company rating requirement may be waived for Worker's compensation coverage only.

11.2.2 Commercial General Liability

Commercial General Liability insurance, including Personal and Advertising Injury Liability and Products and Completed Operations Liability, shall have a minimum limit per occurrence based on the project value. The Insurance Services Office (ISO) Commercial General Liability occurrence coverage form CG 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. Claims-made form is unacceptable.

The aggregate loss limit must apply to <u>each project</u>. ISO form CG 25 03 (current form approved for use in Louisiana), or equivalent, shall also be submitted. The State project number, including part number, and project name shall be included on this endorsement.

COMBINED SINGLE LIMIT (CSL) PER OCCURRENCE

Type of Construction	Projects up to $1,000,000	Projects over $1,000,000 up to $10,000,000	Projects over $10,000,000
New Buildings:			
Each Occurrence Minimum Limit	$1,000,000	$2,000,000	$4,000,000
Per Project Aggregate	$2,000,000	$4,000,000	$8,000,000
Renovations:	**The building(s) value for the Project is $1,410,000.**		
Each Occurrence Minimum Limit	$1,000,000**	$2,000,000**	$4,000,000**
Per Project Aggregate	2 times per occur limit**	2 times per occur limit**	2 times per occur limit**

**While the minimum Combined Single Limit of $1,000,000 is required for any renovation, the limit is calculated by taking 10% of the building value and rounding it to the nearest $1,000,000 to get the insurance limit. Example: Renovation on a $33,000,000 building would have a calculated $3,000,000 combined single limit of coverage (33,000,000 times .10 = 3,300,000 and then rounding down to $3,000,000). If the calculated limit is less than the minimum limit listed in the above chart, then the amount needed is the minimum listed in the chart. Maximum per occurrence limit required is $10,000,000 regardless of building value. The per project aggregate limit is then calculated as twice the per occurrence limit.

11.2.3 Automobile Liability

Automobile Liability Insurance shall have a minimum combined single limit per occurrence of $1,000,000. ISO form number CA 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. This insurance shall include third-party bodily injury and property damage liability for owned, hired and non-owned automobiles.

11.2.4 Excess Umbrella

Excess Umbrella Insurance may be used to meet the minimum requirements for General Liability and Automobile Liability only.

11.2.5 Builder's Risk

11.2.5.1 Builder's Risk Insurance shall be in an amount equal to the amount of the construction contract including any amendments and shall be upon the entire Work included in the contract. The policy shall provide coverage equivalent to the ISO form number CP 10 20, Broad Form Causes of Loss (extended, if necessary, to include the perils of wind, earthquake, collapse, vandalism/malicious mischief, and theft, including theft of materials whether or not attached to any structure). The policy must include architects' and

engineers' fees necessary to provide plans, specifications and supervision of Work for the repair and/or replacement of property damage caused by a covered peril, not to exceed 10% of the cost of the repair and/or replacement.

11.2.5.2 Flood coverage shall be provided by the Contractor on the first floor and below for all projects, except as otherwise noted. The builder's risk insurance policy, sub-limit for flood coverage shall not be less than ten percent (10%) of the total contract cost per occurrence. If flood is purchased as a separate policy, the limit shall be ten percent (10%) of the total contract cost per occurrence (with a max of $500,000 if NFIP). Coverage for roofing projects shall **not** require flood coverage.

11.2.5.3 A Specialty Contractor may provide an installation floater in lieu of a Builder's Risk policy, with the similar coverage as the Builder's Risk policy, upon the system to be installed in an amount equal to the amount of the contract including any amendments. Flood coverage is not required.

11.2.5.4 The policy must include coverage for the Owner, Contractor and any subcontractors as their interests may appear.

11.2.6 Pollution Liability *(required when asbestos or other hazardous material abatement is included in the contract)*

Pollution Liability insurance, including gradual release as well as sudden and accidental, shall have a minimum limit of not less than $1,000,000 per claim. A claims-made form will be acceptable. A policy period inception date of no later than the first day of anticipated Work under this contract and an expiration date of no earlier than 30 days after anticipated completion of all Work under the contract shall be provided. There shall be an extended reporting period of at least 24 months, with full reinstatement of limits, from the expiration date of the policy if the policy is not renewed. The policy shall not be cancelled for any reason, except non-payment of premium.

11.2.7 Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and accepted by the Owner. The Contractor shall be responsible for all deductibles and self-insured retentions.

11.3 OTHER INSURANCE PROVISIONS

11.3.1 The policies are to contain, or be endorsed to contain, the following provisions:

11.3.1.1 Worker's Compensation and Employers Liability Coverage

11.3.1.1.1 To the fullest allowed by law, the insurer shall agree to waive all rights of subrogation against the Owner, its officers, agents, employees and volunteers for losses arising from Work performed by the Contractor for the Owner.

11.3.1.2 Commercial General Liability Coverage

11.3.1.2.1 The Owner, its officers, agents, employees and volunteers 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. ISO Form CG 20 10 (for ongoing work) AND CG 20 37 (for completed work) (current forms approved for use in Louisiana), or equivalent, are to be used.

11.3.1.2.2 The Contractor's insurance shall be primary as respects the Owner, its officers, agents, employees and volunteers for any and all losses that occur under the contract. The coverage shall contain no special limitations on the scope of protection afforded to the Owner, its officers, officials, employees or volunteers. Any insurance or self-insurance maintained by the Owner shall be excess and non-contributory of the Contractor's insurance.

11.3.1.3 Builder's Risk

The policy must include an endorsement providing the following:

In the event of a disagreement regarding a loss covered by this policy, which may also be covered by a State of Louisiana self-insurance or commercial property policy through the Office of Risk Management (ORM), Contractor and its insurer agree to follow the following procedure to establish coverage and/or the amount of loss:

Any party to a loss may make written demand for an appraisal of the matter in disagreement. Within 20 days of receipt of written demand, the Contractor's insurer and either ORM or its commercial insurance company shall each select a competent and impartial appraiser and notify the other of the appraiser selected. The two appraisers shall select a competent and impartial umpire. The appraisers shall then identify the policy or policies under which the loss is insured and, if necessary, state separately the value of the property and the amount of the loss that must be borne by each policy. If the two appraisers fail to agree, they shall submit their differences to the umpire. A written decision by any two shall determine the policy or policies and the amount of the loss. Each insurance company agrees that the decision of the appraisers and the umpire if involved shall be binding and final and that neither party will resort to litigation. Each of the two parties shall pay its chosen appraiser and bear the cost of the umpire equally.

11.3.1.4 All Coverages

11.3.1.4.1 All policies must be endorsed to require 30 days written notice of cancellation to the Agency. Ten-day written notice of cancellation is acceptable for non-payment of premium. Notifications shall comply with the standard cancellation provisions in the Contractor's policy. In addition, Contractor is required to notify Agency of policy cancellations or reductions in limits.

11.3.1.4.2 Neither the acceptance of the completed Work nor the payment thereof shall release the Contractor from the obligations of the insurance requirements or indemnification agreement.

11.3.1.4.3 The insurance companies issuing the policies shall have no recourse against the Owner for payment of premiums or for assessments under any form of the policies.

11.3.1.4.4 Any failure of the Contractor to comply with reporting provisions of the policy shall not affect coverage provided to the Owner, its officers, agents, employees and volunteers.

11.3.2 Acceptability of Insurers

All required insurance shall be provided by a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located. Insurance shall be placed with insurers with an A.M. Best's rating of **A-: VI or higher**. This rating requirement may be waived for Worker's compensation coverage only.

If at any time an insurer issuing any such policy does not meet the minimum A.M. Best rating, the Contractor shall obtain a policy with an insurer that meets the A.M. Best rating and shall submit another certificate of insurance within 30 days.

11.3.3 Verification of Coverage

Contractor shall furnish the Owner with Certificates of Insurance reflecting proof of required coverage. The Certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The Certificates are to be received and approved by the Owner before Work commences and upon any contract renewal or insurance policy renewal thereafter. The Certificate Holder must be listed as follows:

State of Louisiana
Name of Owner
Owner Address
City, State, Zip
Attn: Project # _____

The Owner reserves the right to request complete certified copies of all required insurance policies at any time.

Upon failure of the Contractor to furnish, deliver and maintain required insurance, this contract, at the election of the Agency, may be suspended, discontinued, or terminated. Failure of the Contractor to purchase and/or maintain any required insurance shall not relieve the Contractor from any liability or indemnification under the contract.

If the Contractor does not meet the insurance requirements at policy renewal, at the option of the Owner, payment to the Contractor may be withheld until the requirements have been met, OR the Owner may pay the renewal premium and withhold such payment

from any monies due the Contractor, OR the contract may be suspended or terminated for cause.

11.3.4 Subcontractors

Contractor shall include all subcontractors as insureds under its policies OR shall be responsible for verifying and maintaining the certificates provided by each subcontractor. Subcontractors shall be subject to all of the requirements stated herein. The Owner reserves the right to request copies of subcontractor's certificates at any time.

If Contractor does not verify subcontractors' insurance as described above, Owner has the right to withhold payments to the Contractor until the requirements have been met.

11.3.5 Worker's Compensation Indemnity

In the event Contractor is not required to provide or elects not to provide Worker's compensation coverage, the parties hereby agree the Contractor, its Owners, agents and employees shall have no cause of action against, and shall not assert a claim against, the State of Louisiana, its departments, agencies, agents and employees as an employer, whether pursuant to the Louisiana Worker's Compensation Act or otherwise, under any circumstance. The parties also hereby agree that the State of Louisiana, its departments, agencies, agents and employees shall in no circumstance be, or considered as, the employer or statutory employer of Contractor, its Owners, agents and employees. The parties further agree that Contractor is a wholly independent Contractor and is exclusively responsible for its employees, Owners, and agents. Contractor hereby agrees to protect, defend, indemnify and hold the State of Louisiana, its departments, agencies, agents and employees harmless from any such assertion or claim that may arise from the performance of this contract.

11.3.6 Indemnification/Hold Harmless Agreement

Contractor agrees to protect, defend, indemnify, save, and hold harmless, the State of Louisiana, all State Departments, Agencies, Boards and Commissions, its officers, agents, servants, employees and volunteers, from and against any and all claims, damages, expenses and liability arising out of injury or death to any person or the damage, loss or destruction of any property which may occur, or in any way grow out of, any act or omission of Contractor, its agents, servants and employees, or any and all costs, expenses and/or attorney fees incurred by Contractor as a result of any claims, demands, suits or causes of action, except those claims, demands, suits or causes of action arising out of the negligence of the State of Louisiana, all State Departments, Agencies, Boards, Commissions, its officers, agents, servants, employees and volunteers.

Contractor agrees to investigate, handle, respond to, provide defense for and defend any such claims, demands, suits or causes of action at its sole expense and agrees to bear all other costs and expenses related thereto, even if the claims, demands, suits, or causes of action are groundless, false or fraudulent. The State of Louisiana may, but is not required to, consult with the Contractor in the defense of claims, but this shall not affect the Contractor's responsibility for the handling and expenses of all claims.

11.4 PERFORMANCE AND PAYMENT BOND

11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

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 Recordation of Contract and Bond [La R.S. 38:2241 thru 38:2241.1]

The Owner shall record within thirty (30) days the Contract Between Owner and Contractor and Performance and Payment Bond with the Clerk of Court in the Parish in which the Work is to be performed.

ARTICLE 12

UNCOVERING AND CORRECTION OF WORK

12.2 CORRECTION OF WORK

12.2.1 Before Substantial Completion

At the end of the paragraph, add the following sentences:
"If the Contractor fails to correct Work identified as defective within a thirty (30) day period, through no fault of the Designer, the Owner may hold the Contractor in default. If the Owner finds the Contractor in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety has not corrected the nonconforming Work, through no fault of the Architect or Owner, the Owner may contract to have nonconforming Work corrected and hold the Surety and Contractor responsible for the cost, including architectural fees and other indirect costs. If the Surety fails to correct the Work within the stipulated time period and fails to meet its obligation to pay the costs, the Owner may elect not to accept bonds submitted in the future by the Surety. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future state contracts.

12.2.2 After Substantial Completion

12.2.2.1 At the end of the paragraph delete the last sentence and add the following sentences:
"If the Contractor fails to correct nonconforming Work, or Work covered by warranties, within a thirty (30) day period, through no fault of the Architect or Owner, the Owner may hold the Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety has not corrected the non-conforming or warranty Work, through no fault of the Architect or Owner, the Owner may contract to have the nonconforming or warranty Work corrected and hold the Surety responsible for the cost including architects fees and other indirect costs. Corrections by the Owner shall be in accordance with Section 2.4. If the Surety

fails to correct the nonconforming or warranty Work within the stipulated time period and fails to meet its obligation to pay the costs, the Owner may not accept bonds submitted, in the future, by the Surety."

ARTICLE 13

MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

Delete all after the word "located".

13.2 SUCCESSORS AND ASSIGNS

13.2.1 In the second sentence, delete "Except as … 13.2.2"

Delete Section 13.2.2.

13.3 RIGHTS AND REMEDIES

Add the following Section 13.3.3:

13.3.3 The Nineteenth Judicial Court in and for the Parish of East Baton Rouge, State of Louisiana shall have sole jurisdiction and venue in any action brought under this contract.

13.4 TESTS AND INSPECTIONS

In Section 13.4.1, delete the second sentence and substitute the following:

The Contractor shall make arrangements for such tests, inspections and approvals with the Testing Laboratory provided by the Owner, and the Owner shall bear all related costs of tests, inspections and approvals.

Delete the last two sentences of Section 13.4.1.

13.5 INTEREST

Delete Section 13.5.

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

Delete Section 14.1.1.4.

In Section 14.1.3, after the word "profit," delete the words "on Work not executed" and substitute the following: "for Work completed prior to stoppage".

14.2 TERMINATION BY THE OWNER FOR CAUSE

Add the following Section:

14.2.1.5 failure to complete the punch list within the lien period as provided in 9.8.7.

14.2.3 Add the following sentence:

"Termination by the Owner shall not suspend assessment of liquidated damages against the Surety."

Add the following Section:

14.2.5 If an agreed sum of liquidated damages has been established, termination by the Owner under this Article shall not relieve the Contractor and/or Surety of his obligations under the liquidated damages provisions and the Contractor and/or Surety shall be liable to the Owner for per diem liquidated damages.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

In Section 14.4.3, delete all after "incurred by reason of the termination," and add "along with reasonable profit on the Work not executed."

ARTICLE 15

CLAIMS AND DISPUTES

15.1 CLAIMS

Delete Section 15.1.2, **Time Limit on Claims,** (See La R.S. 38:2189, and 38:2189.1).

15.1.3.1 Add the following to the end of the paragraph:
"A Reservation of Rights and similar stipulations shall not be recognized under this contract as having any effect. A party must make a claim as defined herein within the time limits provided."

15.1.4.2 In the first sentence of the Section, delete "Initial Decision Maker's" and replace with "Architect's". In the second sentence of the Section, delete "the decision of the Initial Decision Maker" and replace with: "his/her decision".

Delete Section 15.1.6.2 and substitute the following:

15.1.6.2 If adverse weather conditions are the basis for a claim for additional time, the Contractor shall document that weather conditions had an adverse effect on the scheduled construction. An increase in the contract time due to weather shall not be cause for an increase in the contract sum. At the end of each month, the Contractor shall make one Claim for any adverse weather days occurring within the month. The

Claim must be accompanied by sufficient documentation evidencing the adverse days and the impact on construction. Failure to make such Claim within **twenty-one (21) days** from the last day of the month shall prohibit any future claims for adverse days for that month. No additional adverse weather days shall be granted after the original or extended contract completion date, except those adverse weather days associated with a National Weather Service named storm or federally declared weather related disaster directly affecting the project site.

Add the following Section:

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

January	11 days	July	6 days
February	10 days	August	5 days
March	8 days	September	4 days
April	7 days	October	3 days
May	5 days	November	5 days
June	6 days	December	8 days

The Contractor shall ask for total adverse weather days. The Contractor's request shall be considered only for days over the allowable number of days stated above.

Note: Contract is on a calendar day basis.

15.2 INITIAL DECISION

15.2.1 In the second sentence, delete the word "will" and replace with: "shall always".

In the second sentence, delete the phrase: ", unless otherwise indicated in the Agreement."

In the third sentence, delete the word "mediation" and replace with: "litigation".

At the end of the third sentence, add: "arising prior to the date final payment is due".

Delete the fourth sentence.

15.2.5 In the middle of the first sentence, delete all after the phrase: "rejecting the Claim".

In the second sentence, delete the phrase: "and the Architect, if the Architect is not serving as the Initial Decision Maker,".

In the third sentence, delete all after: "binding on the parties" and add the following: "except that the Owner may reject the decision or suggest a compromise or both".

Delete Section 15.2.6.

Delete Section 15.2.6.1.

15.3 MEDIATION

Delete Section 15.3.

15.4 ARBITRATION

Delete Section 15.4.

FOR INFORMATION ONLY

This document will be prepared by Facility Planning & Control in the form appropriate for the project.

STATE OF LOUISIANA
PARISH OF **«PARISH_OF_PROJECT»**

CONTRACT BETWEEN OWNER AND CONTRACTOR
AND PERFORMANCE AND PAYMENT BOND

This agreement entered into this _____ day of _____, 2025, by **«Contractor»** hereinafter called the "Contractor", whose business address is **«Contractor_Address», «Contractor_City», «Contractor_State» «Contractor_Zip»**, and the State of Louisiana Division of Administration, herein represented by the contracting officer executing this contract, hereinafter called the "Owner".

Witnesseth that the Contractor and the Owner, in consideration of premises and the mutual covenants; consideration and agreement herein contained, agree as follows:

Statement of Work: The contractor shall furnish all labor and materials and perform all of the work required to build, construct and complete in a thorough and workmanlike manner:

«Project_Reference_1»
«Project_Reference_2»
«Project_Reference_3»
«Project_City», Louisiana
Project No.: «ProjectNo», «Part_No»«WBS»;
«Supplement_Project_No», Part «Supplement_Part_No»
(«Supplement_WBS»)(Supplement)
State ID No.: «StateID» Site Code: «SiteCode»

in strict accordance with Contract Documents prepared by:

«Designer»
«Designer_Address»
«Designer_City», «Designer_State» «Designer_Zip»

It is recognized by the parties herein that said Contract Documents including by way of example and not of limitation, the Drawings and Specifications dated **«Drawings_and_Specs_Date»**, Addenda number(s) **«Addenda_No»**, the Instruction to Bidders, Bid Form, General Conditions, Supplementary Conditions, any Addenda thereto, impose duties and obligations upon the parties herein, and said parties thereby agree that they shall be bound by said duties and obligations. For these purposes, all of the provisions contained in the aforementioned Construction Documents are incorporated herein by reference with the same force and effect as though said Construction Documents were herein set out in full.

Time for Completion: The work shall be commenced on a date to be specified in a written order of the Owner and shall be completed within **«Time_Completion_Days» («Time_Completion_Days»)** consecutive calendar days from and after the said date.

Liquidated Damages: Contractor shall be assessed Liquidated Damages in the amount of **«Liquidated_Damages_Cost_Per_Day»** per day for each consecutive calendar day which work is not complete beginning with the first day beyond the completion time.

Compensation to be paid to the Contractor: The Owner will pay and the Contractor will accept in full consideration for the performance of the contract the sum of **«Contract_Amount_Words» and No/100 Dollars («Contract_Amount_Numeral»)** which sum represents the **«Base_Bid_Only_or_Plus_Alternates»**

Taxes: Contractor hereby agrees that the responsibility for payment of taxes from the funds thus received under this Contract and/or legislative appropriation shall be contractor's obligation and identified under Federal tax identification number _____.

Performance and Payment Bond: To these presents personally came and intervened _____, herein acting for _____, a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business in the State of Louisiana, as surety, who declared that having taken cognizance of this contract and of the Construction Documents mentioned herein, he hereby in his capacity as its Attorney in Fact obligates his said company, as Surety for the said Contractor, unto the said Owner, up to the sum of **«Contract_Amount_Words» and No/100 Dollars («Contract_Amount_Numeral»)**. By issuance of this bond, the surety acknowledges they are in compliance with R.S. 38:2219.

The condition of this performance and payment bond shall be that should the Contractor herein not perform the contract in accordance with the terms and conditions hereof, or should said Contractor not fully

indemnify and save harmless the Owner, from all cost and damages which he may suffer by said Contractor's non-performance or should said Contractor not pay all persons who have and fulfill obligations to perform labor and/or furnish materials in the prosecution of the work provided for herein, including by way of example workmen, laborers, mechanics, and furnishers of materials, machinery, equipment and fixtures, then said Surety agrees and is bound to so perform the contract and make said payment(s).

Provided, that any alterations which may be made in the terms of the contract or in the work to be done under it, or the giving by the Owner of any extensions of time for the performance of the contract, or any other forbearance on the part of either the Owner or the Contractor to the other shall not in any way release the Contractor or the Surety from their liability hereunder, notice to the Surety of any such alterations, extensions or other forbearance being hereby waived.

Contractor acknowledges and agrees to comply with the provisions of La. R.S. 38:2212.10 and federal law pertaining to E-Verify in the performance of services under this Contract.

It is hereby agreed that the Legislative Auditor of the State of Louisiana and/or the Office of the Governor, Division of Administration auditors shall have the option of auditing all accounts of contractor which relate to this contract.

The continuation of this contract is contingent upon the appropriation of funds to fulfill the requirements of the contract by the legislature. If the legislature fails to appropriate sufficient monies to provide for the continuation of the contract, or if such appropriation is reduced by the veto of the Governor or by any means provided in the appropriations act to prevent the total appropriation for the year from exceeding revenues for that year, or for any other lawful purpose, and the effect of such reduction is to provide insufficient monies for the continuation of the contract, the contract shall terminate on the date of the beginning of the first fiscal year for which funds are not appropriated.

The contractor agrees to abide by the requirements of the following as applicable: Title VI of the Civil Rights Act of 1964 and Title VII of the Civil Rights Act of 1964, as amended by the Equal Employment Opportunity Act of 1972, Federal Executive Order 11246 as amended, the Rehabilitation Act of 1973, as amended, the Vietnam Era Veteran's Readjustment Assistance Act of 1974, Title IX of the Education Amendments of 1972, the Age Discrimination Act of 1975, the Fair Housing Act of 1968 as amended, and contractor agrees to abide by the requirements of the Americans with Disabilities Act of 1990.

Contractor agrees not to discriminate in its employment practices, and will render services under this contract without regard to race, color, religion, sex, sexual orientation, national origin, veteran status, political affiliation, disability, or age in any matter relating to employment. Any act of discrimination committed by Contractor, or failure to comply with these statutory obligations when applicable shall be grounds for termination of this contract.

In accordance with R.S. 39:1602.1, effective May 22, 2018, for any contract for $100,000 or more and for any contractor with five or more employees, Contractor, or any Subcontractor, shall certify it is not engaging in a boycott of Israel, and shall, for the duration of this contract, refrain from a boycott of Israel. The State reserves the right to terminate this contract if the Contractor, or any Subcontractor, engages in a boycott of Israel during the term of the contract.

In accordance with La. R.S. 39:1602.2, the following applies to any competitive sealed bids, competitive sealed proposals, or contract(s) with a value of $100,000 or more involving a for-profit company with at least fifty full-time employees:

Unless otherwise exempted by law, by submitting a response to this solicitation or entering into this contract, the Bidder, Proposer or Contractor certifies the following:

1. The company does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association based solely on the entity's or association's status as a firearm entity or firearm trade association;
2. The company will not discriminate against a firearm entity or firearm trade association during the term of the contract based solely on the entity's or association's status as a firearm entity or firearm trade association.

The State reserves the right to reject the response of the Bidder, Proposer or Contractor if this certification is subsequently determined to be false, and to terminate any contract awarded based on such a false response or if the certification is no longer true.

Contractor has a continuing obligation to disclose any suspensions or debarment by any government entity, including but not limited to General Services Administration (GSA). Failure to disclosed may constitute grounds for suspension and/or termination of the Contract and debarment from future Contracts.

Contractor, and each tier of Subcontractors, shall certify that it is not on the List of Parties Excluded from Federal Procurement or Nonprocurement Programs promulgated in accordance with E.O.s 12549 and 12689, "Debarment and Suspension," as set forth at 24 CFR part 24.

In Witness whereof, the parties hereto on the day and year first above written have executed this agreement in six (6) counterparts, each of which shall, without proof or accountancy for the other counterparts, be deemed an original thereof.

THUS DONE AND SIGNED at Baton Rouge, Louisiana, on the day, month, and year first written above.

WITNESSES:

STATE OF LOUISIANA
DIVISION OF ADMINISTRATION

BY: _____
MATTHEW H. BAKER,
FP&C DIRECTOR

_____
FP&C Witness #1 Sign Here

_____
FP&C Witness #2 Sign Here

BY: _____
«CONTRACTOR»

_____
Contractor Witness #1 Sign Here

_____
Contractor Witness #2 Sign Here

SURETY:

BY: _____
ATTORNEY IN FACT

_____
Surety Witness #1 Sign Here

_____
Surety Witness #2 Sign Here

_____
ADDRESS

_____
TELEPHONE NUMBER

STATE OF LOUISIANA
PARISH OF **«PARISH_OF_CONTRACTOR»**

PROJECT NO.:«ProjectNo», «Part_No»«WBS»;
«Supplement_Project_No», Part
«Supplement_Part_No» («Supplement_WBS»)(Supplement)
NAME: «Project_Reference_1»
«Project_Reference_2»
«Project_Reference_3»
LOCATION: «Project_City»

NON-COLLUSION AFFIDAVIT

Before me, the undersigned authority, duly commissioned and qualified within and for the State and Parish aforesaid, personally came and appeared _____ representing **«Contractor»** who, being by me first duly sworn deposed and said that he has read this affidavit and does hereby agree under oath to comply with all provisions herein as follows:

PART I.

Section 2224 of Part II of Chapter 10 of Title 38 of the Louisiana Revised Statutes, as amended.

(1) That affiant 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 affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for affiant; and

(2) That no part of the Contract price received by affiant 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 in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for affiant.

PART II.

Section 2190 of Part I of Chapter 10 of Title 38 of the Louisiana Revised Statutes, as amended.

That affiant, if an architect or engineer, or representative thereof, does not own a substantial financial interest, either directly or indirectly, in any corporation, firm, partnership, or other organization which supplies materials for the construction of a public work when the architect or engineer has performed architectural or engineering services, either directly or indirectly, in connection with the public work for which the materials are being supplied.

For the purposes of this Section, a "substantial financial interest" shall exclude any interest in stock being traded on the American Stock Exchange or the New York Stock Exchange.

That affiant, if subject to the provisions of this section, does hereby agree to be subject to the penalties involved for the violation of this section.

_____
AFFIANT

SWORN TO AND SUBSCRIBED BEFORE ME THIS _____ DAY OF _____, 2025.

_____
NOTARY

Tornado Damage Building Repair & Reconstruction
Dean Lee Research and Extension Ctr
LSU AgCenter
Alexandria, Louisiana
Name of Project

19-607-21-01,
F.19002617
Project No.

STATE OF _____

PARISH OF _____

ATTESTATIONS AFFIDAVIT

Before me, the undersigned notary public, duly commissioned and qualified in and for the parish and state aforesaid, personally came and appeared Affiant, who after being duly sworn, attested as follows:

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

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 below 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. Within the past five years from 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 below 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) Issuing worthless checks (R.S. 14:71)
(f) Bank fraud (R.S. 14:71.1)
(g) Forgery (R.S. 14:72)
(h) Contractors; misapplication of payments (R.S. 14:202)
(i) Malfeasance in office (R.S. 14:134)

LA. R.S. 38:2212.10 Verification of Employees

A. At the time of bidding, Appearer is registered and participates in a status verification system to verify that all new hires in the state of Louisiana are legal citizens of the United States or are legal aliens.

B. If awarded the contract, Appearer shall continue, during the term of the contract, to utilize a status verification system to verify the legal status of all new employees in the state of Louisiana.

C. If awarded the contract, Appearer shall require all subcontractors to submit to it a sworn affidavit verifying compliance with Paragraphs (A) and (B) of this Subsection.

Tornado Damage Building Repair & Reconstruction
Dean Lee Research and Extension Ctr
LSU AgCenter
Alexandria, Louisiana
Name of Project

19-607-21-01, F.19002617
Project No.

LA. R.S. 23:1726(B) Certification Regarding Unpaid Workers Compensation Insurance

A. R.S. 23:1726 prohibits any entity against whom an assessment under Part X of Chapter 11 of Title 23 of the Louisiana Revised Statutes of 1950 (Alternative Collection Procedures & Assessments) is in effect, and whose right to appeal that assessment is exhausted, from submitting a bid or proposal for or obtaining any contract pursuant to Chapter 10 of Title 38 of the Louisiana Revised Statutes of 1950 and Chapters 16 and 17 of Title 39 of the Louisiana Revised Statutes of 1950.

B. By signing this bid /proposal, Affiant certifies that no such assessment is in effect against the bidding / proposing entity.

_____	_____
NAME OF BIDDER	**NAME OF AUTHORIZED SIGNATORY OF BIDDER**
_____	_____
DATE	**TITLE OF AUTHORIZED SIGNATORY OF BIDDER**

_____
SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER/AFFIANT

Sworn to and subscribed before me by Affiant on the _____ day of _____ , 20___ .

_____
Notary Public

Facility Planning & Control
15. PRE-CONSTRUCTION CONFERENCE AGENDA

As a minimum, the following items are to be covered in the pre-construction conference. The Designer may, at his discretion, add additional items which he feels are important to this particular project.

1. Contractor shall furnish the following prior to his first payment:

a. Cost breakdown (Schedule of Values), shall be in standard Construction Specifications Institute format.
b. List Sub-contractors and major suppliers
c. Information listed in Paragraph 7.1 of the Supplementary Conditions.
d. Construction Schedule as defined in 3.10.2 of General Conditions and Supplementary Conditions.
No payments to the contractor shall be made until this information is provided.

2. Roles of Individuals:

a. **Designer** – shall be solely responsible for the direction of the project. The Designer shall keep minutes of all meetings, including construction progress meetings, and distribute within 7 days. All instructions to contractor shall come from the designer. All decisions and directions shall be in writing. Verbal instructions shall be immediately confirmed in writing. The Designer and his principal consultants shall visit the project regularly according to the requirements of the Louisiana Capital Improvement Projects Procedure Manual for Design and Construction.
The Designer shall NOT assume the role of his principal consultants in site visits. Copies of Designer Site Visit Reports are to be sent to Facility Planning and Control and the User Agency on a weekly basis.
b. **Facility Planning and Control** - Designer to receive instructions only from Facility Planning and Control. Program or design changes shall be approved by Facility Planning and Control prior to any work being performed by the Designer.
c. **User Agency** - Address all requests for changes through Facility Planning and Control. Establish ground rules for the contractor and his personnel while working on their premises. If representatives of Facility Planning & Control or the using agency find any discrepancies, they believe to be contrary to the Contract Documents, they shall notify the designer. If it is thought that discrepancy needs immediate attention, the individual discovering the discrepancy and the contractor's representative should call the designer for immediate resolution.
d. **Contractor** - Work shall be according to the Contract Documents, not necessarily standard practice. Emergency action to protect life or property shall be taken immediately by the superintendent on the site. Less urgent action shall be resolved by telephone among the appropriate parties. Fire Marshal approved documents shall be accessible at all times at the project site, in accordance with Fire Marshal requirements. Approved documents from all other applicable regulatory agencies shall also be accessible at all times at the project site.

3. Change Orders:

All requests for a change in time and/or money shall be submitted to the designer, with proper back up data, for his review. The designer shall submit the Change Order to Facility Planning and Control with his recommendation of action required. The Change Order shall be approved by FP&C prior to any additional work being performed.

a. Change Orders cannot be approved without the proper breakdown as required by the Supplementary Conditions, Section 7.2. The same requirements apply to time extension requests.
b. Facility Planning and Control needs only the original and one (1) copy of backup.
c. Change Orders should be rounded to the nearest whole dollar amount.
d. User paid change orders are **not** allowed.

e. User requested change orders are to be avoided.

4. Invoice Procedure:

a. Invoices may be submitted in electronic format.

1) Contractor shall submit one Certificate for Payment directly to the Designer. Facility Planning and Control – Application and Certification for Payment forms shall be used for submittal. Certificate for payment need **not** be notarized.
2) After review, the Designer shall process the Certificate as promptly as possible, in any case within seven (7) days. If a Certificate is held for any reason, written notice stating the reason for delay should be given the owner and the contractor. If a Certificate is changed for any reason, changes will be made to all copies.
3) Distribution of copies shall be as follows:
a) Designer forwards one Certificate for Payment directly to Facility Planning and Control with a transmittal letter/memo.
b) Designer forwards copy of transmittal letter and one (1) copy of Certificate to Contractor. One (1) copy retained for Designer records. One (1) copy sent to User Agency.

b. During construction, designer's invoices shall be sent directly to Facility Planning & Control.

c. If federal funds are involved, compliance with additional regulations is required including but not limited to:
Davis Bacon Act - Wage rate & payroll records.
Drug Free Workplace Act
Civil Rights EOP poster with name of EOP person shown.

d. Stored Materials must be on site for payment to be made. Payment will not be made for materials stored in a bonded warehouse or elsewhere.

e. An Original <u>45 Day</u> Clear Lien and an Original Consent of Surety (AIA Form G707) is required prior to final payment to the contractor.

5. Prior Approval:

Only items as specified or prior approved in accordance with the Contract Documents will be incorporated into the project. Approval of shop drawings does not relieve Contractor of complying with the Prior Approval clause.

6. Testing Lab:

a. The Owner will engage and pay for the testing laboratory if required. If the Contractor obtains the services of a testing laboratory, he will be responsible for all costs for that laboratory
b. Designer should furnish Testing Lab with written notice of types and frequency of required tests. Set up procedure for Testing Lab notification.
c. No off site testing unless called for in the Contract Documents.
d. Facility Planning and Control will pay a minimum of standby time. Contractor may be billed if not well controlled.
e. Testing Lab invoices shall be submitted by hardcopy or in electronic format through the Designer, who in turn acknowledges their recognition of services submitted.

7. Project Sign

When a project sign is specified, select location.

8. Meetings:

Establish a time and place for the Monthly Meeting. Designer shall notify FP&C prior to and provide minutes of all meetings to all participants within 7 days.

9. Roofing:

Pre-roofing Conference - establish a direct line of communication, iron out initial questions regarding the project and to review project submittal requirements. This conference should be held shortly after award of the roofing contract and a minimum of six (6) weeks prior to the anticipated start of roofing. Attendance by general contractor,

roofing subcontractor and manufacturer's representative is required. A letter from the manufacturer stating the roofer is an approved applicator and sample warranties shall be submitted at the Pre-roofing Conference, if not before.

a. General Guidelines for Low Sloped Roofs
   1) Details in compliance with NRCA and Roof Manufacturer
   2) Concrete Decks are to be primed.
   3) Nailable Decks; Red Rosin sheet is required on wood decks.
   4) Fastening per manufacturer's requirements to comply with I-90 FM rating.
   5) Asphalt
      a) Type IV asphalt shall be used for all modified bitumen mop-down systems
      b) Temperature at the point of application shall be the EVT temperature plus or minus 25 degrees.
   6) Insulation
      a) All wet insulation is to be rejected and removed from the site.
      b) All insulation joints shall be staggered, including daily tie-ins.
   7) Metal
      a) Color Selection
      b) Gravel guard - use minimal raised lip for areas where drainage is over the edge.
      8) Drainage: Most guarantees prohibit water remaining on the roof more than 48 hours.
   9) Roofing guarantees
      a) No dollar limit. Guarantee system from the deck up, naming all products within the system.
      b) No language about "no pay, no guarantee".
      c) Warranty start date to be on or very near date of Acceptance of Building Contract. The roofing warranty required for his project must meet the requirements of FP&C. It is important that the roofing manufacturer and applicator are aware of this. An incomplete or incorrect warranty **will** delay acceptance.
      d) Supplementary Conditions Section 13.3.3, the Nineteenth Judicial Court in and for the Parish of East Baton Rouge, State of Louisiana shall have sole jurisdiction in any action brought under this contract.
   10) Manufacturer's specification to be used in support of designer's specification. Manufacturer's requirements are a minimum, use designer's specification if it exceeds.
   11) Track weather days including predicted rain percentage. Submit to designer monthly with pay estimate.

Pre-application Conference to verify readiness of the project structure, review assignments of Preliminary Conference, scan last minute details, changes or corrections and to review the anticipated schedule of progress. This conference should be held within one (1) week of roofing application. Attendance by general contractor, roofing subcontractor and superintendent or foreman and manufacturer's representative is required.

Representatives of the designer and FP&C shall be visiting the site to make sure the roof is being installed per the manufacturers' requirements and the Contract Documents. If found not in compliance, tests and corrective measures may be required to prove the roof is acceptable. Tests include Blow-Off Testing, etc.

Moisture Survey - When installation is complete, FP&C will arrange to have a moisture survey performed. Deficiencies will be noted, either on the roof with paint or on roof plan drawing or both. After these deficiencies are corrected, this office will arrange to have these areas resurveyed. If these deficiencies are found not to be corrected and additional survey time is required, then the cost of this time will be assessed against the contractor at a rate of $50.00 per hour through a credit change order.

Designer: Please fill out "Roof Completion Information" form and submit it with the Recommendation of Acceptance. If the roofed section is new, a scaled drawing is also needed. Preferably, this drawing would be on AutoCAD in compliance with the layers specified in our "Instructions to Designers."

10. General Correspondence:

a. Project Number must be on all correspondence.

b. Contractor shall copy Facility Planning and Control on any correspondence **if**:

1) It involves a controversial issue.

2) It relates to information requests to the Designer that had not been furnished in a timely manner.

11. Miscellaneous Items to be Discussed as Necessary:

a. Shop drawings, samples, hardware, and color schedules. Shop drawings submitted to the user by the designer are for record purposes only, not for approval. Approval is the sole responsibility of the designer.
COLOR SELECTION: If the User does not approve color selections in a timely manner, the Designer, in consultation with FP&C, shall make the selections, which will be final.

b. Establish the location and type of temporary facilities and utilities. Establish how payment for temporary utilities will be made and how costs will be tracked?

c. Outages/Interruptions of Services. Contractor is to request, in writing, all outages/interruptions to the User. The amount of advance notice is to be determined by the user. Coordination of outages or interruptions is the responsibility of the contractor

d. Contractor use/access to pertinent buildings and facilities.

e. Location of staging area and/or fencing.

f. Site and stored material security is the contractor's responsibility.

g. Use of site, parking of vehicles, decals and/or permits for parking

h. The User shall have first refusal of salvaged materials. Where are they to be delivered? The contractor is responsible for the disposition of all other materials in accordance with laws and regulations.

i. Safety and First Aid. This is the contractor's responsibility.

j. Procedure for keeping Record Documents. Contractor to record as-built information that varies from the contract documents, on (1) one set of prints, to be furnished to the Designer at completion of the job. As-builts are prepared by Designer, inclusive of Supplemental Drawings, the Contractor, based on the as-built work and the required adjustments to the contract documents and the change orders, and shall be submitted timely to Facility Planning and Control**.** Plans shall be marked **"AS-BUILT"**. As-built drawings submitted to FP&C shall consist of (2) two full size paper sets of Record Drawings (As-Built) prepared by the Designer. Also required are (2) two disks or flash drives of As-built drawings in AutoCAD (.dwg) and .pdf format, including electronic copies of the bid specifications and addenda. Acceptable As-builts are required prior to the Designer's final payment.

k. Use of any Asbestos Containing materials is prohibited.

l. Pictures or videos of existing conditions may be made.

m. Near the end of the project the FP&C Project Manager will review the work to determine compliance with FP&C's ADA Non-Comprehensive Field Checklist. Any accessibility problems identified in this review shall be corrected before the project can be considered complete.

12. Pre-Close Out Conference

When the project reaches 75 to 80% completion the Designer will schedule a meeting with the Contractor, FP&C and the User to review the requirements and procedures for the Final Inspection and Acceptance.

SCHEDULE OF VALUES

The Contractor is to use the following format. The total Contract Cost is to be itemized in each Subsection listed (as applicable)

DIVISION 01 – GENERAL REQUIREMENTS	Quantity	Cost
01 00 00 General Requirements	_____	_____
01 32 50 Record Drawings, Shop Drawings, Product Data, Samples and other submittals.	_____	_____
	TOTAL	_____
DIVISION 02 – EXISTING CONDITIONS		
02 30 00 Subsurface Investigation	_____	_____
02 41 00 Demolition	_____	_____
	TOTAL	_____
DIVISION 03 – CONCRETE		
	_____	_____
03 01 00 Maintenance of Concrete	_____	_____
03 11 00 Concrete Forming	_____	_____
03 15 00 Concrete Accessories	_____	_____
03 20 00 Concrete Reinforcing	_____	_____
03 30 00 Cast-in-place Concrete	_____	_____
03 40 00 Precast Concrete	_____	_____
03 50 00 Cast Decks & Underlayment	TOTAL	_____
DIVISION 04 – MASONRY		
	_____	_____
04 01 00 Maintenance of Masonry	_____	_____
04 05 13 Masonry Mortaring	_____	_____
04 05 19 Masonry Anchorage & Reinforcing	_____	_____
04 05 23 Masonry Accessories	_____	_____
04 20 00 Unit Masonry	TOTAL	_____
DIVISION 05 – METALS		
	_____	_____
05 05 23 Metal Fastenings	_____	_____
05 10 00 Structural Metal Framing	_____	_____
05 20 00 Metal Joists	_____	_____
05 30 00 Metal Decking	_____	_____
05 50 00 Metal Fabrications	_____	_____
05 58 00 Formed Metal Fabrications	TOTAL	_____
DIVISION 06 – WOOD, PLASTICS, & COMPOSITES		
	_____	_____
06 05 23 Fastening and Adhesives	_____	_____
06 10 00 Rough Carpentry	_____	_____
06 13 00 Heavy Timber	_____	_____
06 17 00 Shop-fabricated Structural Wood	_____	_____
06 20 00 Finish Carpentry	SUB-TOTAL	_____

DISISION 06 – WOOD, PLASTICS, & COMPOSITES (CONTINUES)

06 40 00	Architectural Woodwork		
06 60 00	Plastic Fabrications		
06 80 00	Composite Fabrications		
		TOTAL	

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 10 00	Dampproofing and Waterproofing		
07 18 00	Traffic Coatings		
07 19 00	Water Repellents		
07 21 00	Thermal Insulation		
07 24 00	Exterior Insulation & Finish Systems		
07 25 00	Weather Barriers		
07 31 00	Shingles and Shakes		
07 32 00	Roof Tiles		
07 40 00	Roofing and Siding Panels		
07 50 00	Membrane Roofing		
07 60 00	Flashing and Sheet Metal		
07 61 00	Sheet Metal Roofing		
07 70 00	Roof & Wall Specialties and Accessories		
07 80 00	Fire and Smoke Protection		
07 90 00	Joint Protection		
07 95 00	Expansion Control		
		TOTAL	

DIVISION 08 – OPENINGS

08 11 00	Metal Doors and Frames		
08 14 00	Wood Doors		
08 15 00	Plastic Doors		
08 30 00	Specialty Doors and Frames		
08 41 00	Entrances and Storefronts		
08 44 00	Curtain Wall and Glazed Assemblies		
08 51 00	Metal Windows		
08 52 00	Wood Windows		
08 53 00	Plastic Windows		
08 56 00	Special Function Windows		
08 60 00	Roof Windows and Skylights		
08 70 00	Hardware		
08 80 00	Glazing		
08 90 00	Louvers and Vents		
		TOTAL	

DIVISION 09 – FINISHES

09 22 00	Supports for Plaster and Gypsum Board		
09 23 00	Gypsum Plastering		
09 24 00	Portland Cement Plastering		
09 29 00	Gypsum Board		
09 30 00	Tiling		
		SUB-TOTAL	

DIVISION 09 – FINISHES (CONTINUED)

09 50 00	Acoustical Ceilings		
09 54 00	Specialty Ceilings		
	Quantity		
09 61 00	Flooring Treatment		
09 62 00	Specialty Flooring		
09 63 00	Masonry Flooring		
09 64 00	Wood Flooring		
09 65 00	Resilient Flooring		
09 66 00	Terrazzo Flooring		
09 68 00	Carpeting		
09 69 00	Access Flooring		
09 97 00	Wall Finishes		
09 91 00	Painting		
09 97 00	Special Coatings		
		TOTAL	

DIVISION 10 – SPECIALTIES

10 11 00	Visual Display Surfaces		
10 14 00	Signage		
10 21 00	Compartments and Cubicles		
10 22 00	Partitions		
10 26 00	Wall and Door Protection		
10 28 00	Toilet, Bath, and Laundry Accessories		
10 44 00	Fire Protection Specialties		
10 51 00	Lockers		
10 56 00	Storage Assemblies		
10 82 00	Grilles and Screens	TOTAL	

DIVISION 11 – EQUIPMENT

11 15 00	Security, Detention, and Banking Equipment		
11 19 00	Detention Equipment		
11 23 00	Commercial Laundry and		
	Dry Cleaning Equipment		
11 26 00	Unit Kitchens		
11 27 00	Photographic Processing Equipment		
11 40 00	Foodservice Equipment		
11 51 00	Library Equipment		
11 52 00	Audio-Visual Equipment		
11 53 00	Laboratory Equipment		
11 61 00	Theater and Stage Equipment		
11 65 00	Athletic and Recreational Equipment		
11 70 00	Healthcare Equipment		
		TOTAL	

DIVISION 12 – FURNISHINGS

12 20 00	Window Treatments		
12 30 00	Casework		
12 40 00	Furnishings and Accessories		
12 50 00	Furniture		
		TOTAL	

DIVISION 13 –SPECIAL CONSTRUCTION

13 10 00	Special Facility Components	_____	_____
13 34 00	Fabricated Engineered Structures	_____	_____
13 49 00	Radiation Protection	_____	_____
		TOTAL	_____

DIVISION 14 – CONVEYING EQUIPMENT

14 20 00	Elevators	_____	_____
14 30 00	Escalators and Moving Walks	_____	_____
14 40 00	Lifts	_____	_____
14 80 00	Scaffolding	_____	_____
		TOTAL	_____

DIVISION 21 – FIRE SUPPRESSION

21 10 00	Water-Based Fire-Suppression Systems Piping	_____	_____
21 20 00	Fire-Extinguishing Systems	_____	_____
21 30 00	Fire Pumps	_____	_____
		_____	_____
		TOTAL	_____

DIVISION 22 – PLUMBING

22 07 00	Plumbing Insulation	_____	_____
22 11 00	Facility Water Distribution	_____	_____
22 13 00	Facility Sanitary Sewerage	_____	_____
22 14 00	Facility Storm Drainage	_____	_____
22 30 00	Plumbing Equipment	_____	_____
22 40 00	Plumbing Fixtures	_____	_____
		TOTAL	_____

DIVISION 23 – HEATING, VENTILATING, & AIR-CONDITIONING

23 05 93	Testing, Adjusting, & Balancing for HVAC	_____	_____
23 07 00	HVAC Insulation	_____	_____
23 09 00	Instrumentation & Control for HVAC	_____	_____
23 13 00	Facility Fuel-Storage Tanks	_____	_____
23 20 00	HVAC Piping and Pumps	_____	_____
23 30 00	HVAC Air Distribution	_____	_____
23 40 00	HVAC Air Cleaning Devices	_____	_____
23 50 00	Central Heating Equipment	_____	_____
23 60 00	Central Cooling Equipment	_____	_____
23 70 00	Central HVAC Equipment	_____	_____
		TOTAL	_____

DIVISION 26 – ELECTRICAL

26 09 00	Instrumentation & Control for Electrical Systems	_____	_____
26 10 00	Medium-Voltage Electrical Distribution	_____	_____
26 20 00	Low-Voltage Electrical Transmission	_____	_____
26 27 00	Low-Voltage Distribution Equipment	_____	_____
26 30 00	Facility Electrical Power Generating & Storage Equipment	_____	_____
26 40 00	Electrical and Cathodic Protection	_____	_____
26 50 00	Lighting	_____	_____
		TOTAL	_____

DIVIASION 27 – COMMUNICATIONS

27 10 00	Structured Cabling	_____	_____
27 20 00	Data Communications	_____	_____
27 30 00	Voice Communications	_____	_____
27 40 00	Audio-Video Communications	_____	_____
27 50 00	Distributed Communications & Monitoring Systems	_____	_____
		TOTAL	_____

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 10 00	Electronic Access Control & Intrusion Detection	_____	_____
28 20 00	Electronic Surveillance	_____	_____
28 30 00	Electronic Detection and Alarm	_____	_____
28 40 00	Electronic Monitoring and Control	_____	_____
		TOTAL	_____

DIVISION 31 – EARTHWORK

31 10 00	Site Clearing	_____	_____
31 20 00	Earth Moving	_____	_____
31 31 00	Soil Treatment	_____	_____
31 32 00	Soil Stabilization	_____	_____
31 40 00	Shoring and Underpinning	_____	_____
31 50 00	Excavation Support and Protection	_____	_____
31 60 00	Special Foundations and Load-Bearing Elements	_____	_____
		TOTAL	_____

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 10 00	Bases, Ballasts, and Paving	_____	_____
32 30 00	Site Improvements	_____	_____
32 90 00	Planting	_____	_____
		TOTAL	_____

DIVISION 33 – UTILITIES

33 10 00	Water Utilities	_____	_____
33 30 00	Sanitary Sewerage Utilities	_____	_____
33 40 00	Storm Drainage Utilities	_____	_____
33 50 00	Fuel Distribution Utilities	_____	_____
33 60 00	Hydronic & Steam Energy Utilities	_____	_____
33 70 00	Electrical Utilities	_____	_____
33 80 00	Communications Utilities	_____	_____
		TOTAL	

DIVISION 34 – TRANSPORTATION

34 00 00	Transportation	_____	_____
		TOTAL	_____

DIVISION 35 – WATERWAY AND MARINE CONSTRUCTIONS

35 00 00	Waterway and Marine construction	_____	_____
		TOTAL	_____

DIVISION 40-43 – PROCESS EQUIPMENT

DIVISION 44 – POLLUTION CONTROL EQUIPMENT

44 40 00	Water Treatment Equipment	_____	_____
44 41 00	Packaged Water Treatment Plants	_____	_____
44 50 00	Solid Waste Control	_____	_____
		TOTAL	_____

DIVISION 45 – INDUSTRY SPECIFIC MANUFACTURING EQUIPMENT

DIVISION 48 – ELECTRICAL POWER GENERATION

48 10 00	Electrical Power Generation Equipment	_____	_____
48 70 00	Electrical Power Generation Testing	_____	_____
		TOTAL	_____

Facility Planning & Control

CHANGE ORDER

PROJECT NAME: _____ CHANGE ORDER No. _____

PROJECT & WBS No: _____ CONTRACT DATE: _____

CONTRACTOR: _____ NTP DATE: _____

SITE CODE: _____ STATE ID: _____ SRM No.: _____

You are directed to make the following change(s) in this contract. Attach SUMMARY, BREAKDOWN and/or UNIT PRICE BREAKDOWN forms as required and give a brief description of each change below, including RFI No., cost and days from Summary

The Original Contract Sum		
Total Changes by Previous Change Order(s)		
Current Contract Sum		
Contract Sum will be ☐ unchanged ☐ increased by ☐ decreased by:		
New Contract Sum		
The Original Contract Completion Date and Contract Time. Date: _____		DAYS
Total Time extended by Previous Change Order(s)		DAYS
Contract Time will be ☐ unchanged ☐ increased by ☐ decreased by:		DAYS
New Contract Completion Date & Contract Time Date: _____		DAYS
Added Building Area		(Sq. Ft.)

NOTE ***: No additional increase in time or money will be considered for a Change Order item after it has been executed.***

RECOMMENDED	**ACCEPTED**	**APPROVED**
Designer's Name:	Contractor's Name:	Project Manager:
Address:	Address:	Facility Planning & Control
Email Address:	Email Address:	
By:	By:	By:
Date:	Date:	Date:

FACILITY PLANNING AND CONTROL USE ONLY

Classification	**Amount**	**Classification**	**Amount**
Omission (Type "O")*		**Miscellaneous (Type "M")**	
Error (Type "E")*		**Owner Requested (Type "R")**	

COMMENTS: Senior Manager/Assistant Director approval: _____

Construction Contract Change Order

SUMMARY

State of Louisiana

Facility Planning & Control

Project & WBS No. _____

Item No. _____

RFI No. (or COR, CPR, etc.) _____

Date: _____

Project Name: _____

Contractor Name:

Description of Work:

General Contractor Direct Costs - Breakdown No. _____ _____

(See attached breakdown)

Total General Contractor Cost _____ % _____

(General Contract Direct Cost plus OH&P) (Max: 8%)

Subcontractor Cost Breakdowns

(See attached.)

Subcontractor Name	Breakdown No.	A Total Direct Cost	B OH&P (Max 8%)	C Total A+(A X B)
			%	
			%	
			%	
			%	
			%	
			%	
			%	
			%	

Subcontractor Direct Costs Total _____

(Sum column A)

Subcontractor Direct Costs + Subcontractor OH&P _____

(Sum column C)

General Contractor OH&P on Subcontractor Direct Cost at _____ % _____

(Sum column A times General Contractor OH&P rate.) (Max: 8%)

Total Subcontractor Costs _____

(Subcontractor Direct Costs + OH&P + General Contractor OH&P)

Change Order Subtotal _____

(Sum of Total General Contractor Costs and Total Subcontractor Costs)

Performance and Payment Bond at _____ %

(Change Order Subtotal times Performance and Payment Bond rate)

Amount will be ☐ increased by ☐ decreased by ☐ unchanged _____

(Sum of Change Order Subtotal and Performance and Payment Bond)

Days will be ☐ increased by ☐ decreased by ☐ unchanged _____

(Attach supporting data such as meteorological reports)

Construction Contract Change Order

BREAKDOWN

Breakdown No. _____

State of Louisiana

Item No. _____

Facility Planning & Control

RFI No. (or COR, CPR, etc.) _____

Project & WBS No. _____

Date: _____

Project Name: _____

Contractor/Subcontractor Name: _____

Direct Cost of Work :

A. Labor	Check here if explained on the Comment Sheet ➧	Hourly Wage Rate	Hours	Total Cost
1	☐			
2	☐			
3	☐			
4	☐			
5	☐			
6	☐			
7	☐			
			Sub Total	
			Add Labor Burden @ _____ %	
			LABOR TOTAL	

B. Material		Unit Price	Unit	Units	Total Cost
1	☐	4,200.00			
2	☐				
3	☐				
4	☐				
5	☐				
6	☐				
7	☐				
(Copies of invoices may be required.)				*Sub Total*	
				Add Tax @ _____ %	
				MATERIAL TOTAL	

C. Equipment		Unit Rate	Unit	Units	Total Cost
1	☐				
2	☐				
3	☐				
4	☐				
5	☐				
6	☐				
7	☐				
(Copies of invoices may be required.)				*Sub Total*	
				Add Tax @ _____ %	
				EQUIPMENT TOTAL	

TOTAL DIRECT COST FOR THIS BREAKDOWN:
(Sum A, B & C)

Construction Contract Change Order

BREAKDOWN COMMENT SHEET

Breakdown No. _____

State of Louisiana

Item No. _____

Facility Planning & Control

RFI No. (or COR, CPR, etc.) _____

Project & WBS No. _____

Date: _____

Project Name: _____

Contractor/Subcontractor: _____

A. Labor

No. (From BREAKDOWN Sheet)

B. Material

C. Equipment

Construction Contract Change Order

UNIT PRICE BREAKDOWN

Breakdown No. _____

State of Louisiana — Item No. _____

Facility Planning & Control — RFI No. (or COR, CPR, etc.) _____

Project & WBS No. _____ Date: _____

Project Name: _____

Contractor/Subcontractor: _____

Unit Price Tabulation

(Unit prices must be included in the bid or clearly defined in a standard, industry recognized pricing reference. The pricing reference shall be identified herein.)

Unit Price Description	Reference*	Unit Price	Units	Total

* Reference Legend: _____

Unit Price Total:
(Sum Total column)

State of Louisiana
Division of Administration

Facility Planning and Control

Instructions for Change Order Back Up Forms

The General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition, and the Supplementary Conditions provide for changes in the contract in the form of change orders. The costs of such changes must be carefully, clearly and accurately documented. Facility Planning & Control has prepared a set of forms to be used to provide this documentation in a consistent format that is in accordance with the Contract Documents.

Change orders will typically contain one or more items of work. Each item of work will typically include work by the general contractor and/or one or more subcontractors. The documentation begins with a breakdown of the work of the contractor and each subcontractor. This is prepared using the form entitled "BREAKDOWN." One form for the General Contractor and one for each subcontractor. Each breakdown will be summarized on the form entitled "SUMMARY." Each item of work will, in turn, be summarized on the change order itself. This should be on the face of the change order.

The forms are available as a Microsoft Excel worksheet for ease of preparation, with formulas established for mark-ups and other basic mathematical operations.

These forms are to be used as provided. Any alteration to the forms may cause the change order to be rejected.

GENERAL:

(Refer to Article 7 of the Supplementary and General Conditions)

Forms - There are five forms to be used for all Facility Planning and Control change orders: CHANGE ORDER form, SUMMARY, BREAKDOWN, BREAKDOWN COMMENT SHEET and UNIT PRICE BREAKDOWN. The CHANGE ORDER form is the highest level and is the official, signed document. A CHANGE ORDER form may include one or more items of work, each of which is backed up by a SUMMARY. Each SUMMARY will be backed up with one or more BREAKDOWNs. Any unusual rates, unit costs or quantities may be explained on the COMMENT SHEET. It's simple. The BREAKDOWN form must be used for the general contractor and any subcontractor, at any level, that is to get OH&P. Use as many as needed.

Unit Pricing - Labor, material and equipment breakdown is the standard method of pricing change orders for Facility Planning and Control. However, unit pricing may be considered in some circumstances if the unit prices are clearly established such as by unit prices that were included in the bid. These prices may also be derived from a construction industry standard reference such as R.S. Means. If unit prices were included in the bid they are acceptable for pricing change order work and, in fact, must be used for any work that is included in the change order for which they were established . The UNIT PRICE BREAKDOWN is provided for this purpose.

CHANGE ORDER:

Project identification information: Complete as required. The Site Code, State ID and SRM No(s). (contract numbers) can be obtained from the FP&C Project Manager.

Description: This will include a list of each attached SUMMARY that makes up this change order and a brief statement of the work included in each, including RFI No., cost and days from the SUMMARY page.

New Contract Sum: Calculate the new contract amount using the original contract amount, previous change orders and the new change order. Indicate the appropriate word for increase, decrease or unchanged by selecting the appropriate checkbox.

New Contract Completion Date and Revised Time: Calculate the new contract time using the original Contract Completion Date and Contract Time, previous changes in time and the change in time by this change order. Indicate the appropriate word for increase, decrease or unchanged by selecting the appropriate checkbox. Show days in the main column and the date in the blank indicated.

Added Building Area: Show any building area added by this change order. If none, enter "None."

RECOMMENDED: Show the Designer's name and address, sign on the line indicated as "By:" and date on the indicated line.

ACCEPTED: Show the Contractor's name and address, sign on the line indicated as "By:" and date on the indicated line.

APPROVED: For approval by FP&C.

SUMMARY:

(Refer to Article 7 of the Supplementary and General Conditions)

Item No.: Show the Item number as it will appear on the CHANGE ORDER Form. Note: This may be one of several items included in one CHANGE ORDER form.

RFI No.: Show the number of the request for information. This may be known by another name such as COR (Change Order Request,) CPR (Change Proposal Request,) etc.

Project No., WBS No., Date, Project Name. Will auto-fill from information entered on the first tab.

Contractor: Name of General Contractor. Will auto-fill from information entered on the first tab.

Description of Work: Give a brief description of the work included in this **Item**.

General Contractor Direct Costs: Show the total General Contractor Cost from the BREAKDOWN and show the Breakdown No. in the space provided.

General Contractor Total Cost: Show the total General Contractor Cost plus the General Contractor's overhead and profit. The overhead and profit shall not exceed 8% of the Direct Cost.

Subcontractor Cost Breakdowns: List each subcontractor, Breakdown No. and Total Direct Cost (in column "A") from the attached BREAKDOWN sheets. Show the subcontractor's overhead and profit percentage in column "B" and show the calculated total of the direct cost plus the percentage of the direct cost in column "C." If the electronic version of the form is being used, column "C" will be automatically calculated. The overhead and profit shall not exceed 8% of the Total Direct Cost.

Subcontractor Direct Costs Total: Sum of column "A." This will be used to calculate the General Contractor's overhead and profit on the subcontractors' work. If the electronic version is being used, this will be an automatic calculation.

Subcontractor Direct Costs + Subcontractor OH&P: Sum of column "C." This represents the total amount that subcontractors will be paid. Automatic calculation.

General Contractor OH&P on Subcontractor Direct Cost at ___%. The contractors overhead and profit on the subcontractors' direct cost (without subcontractor OH&P.) Enter the percentage of the contractor's OH&P on the subcontractors' work (not to exceed 8%) and show the calculated total of the subcontractors' direct cost plus the percentage of the direct cost in the space. Automatic calculation.

Total Subcontractor Costs: Total of the last two spaces.

Change Order Subtotal: Total of change order except bond.

Performance and Payment Bond at ____%: Enter bond percentage (from amount provided by the contractor at the Pre-Construction Conference) and calculate the amount for the bond.

Amount will be (increased) (decreased) (unchanged) by: Add bond and calculate total change order amount. Indicate "increase," "decrease" or "unchanged" by checking the appropriate box.

Days will be (increased) (decreased) (unchanged) by: Show the number of days to be added or deleted from the contract, if any, due to changes in scope, adverse weather, unusual delays or other factors, **only** if it is proven the critical path is affected. Note that a change in scope does not necessarily indicate a change in time. Indicate "increased," "decreased" or "unchanged" by checking the appropriate box.

BREAKDOWN:

Item No. Show the Item number as it will appear on the CHANGE ORDER Form and the SUMMARY. Note: This may be one of several items included in one CHANGE ORDER form.

RFI No.: Show the number of the request for information. This may be known by another name such as COR (Change Order Request,) CPR (Change Proposal Request,) etc.

Project No., WBS No., Date, Project Name. Will auto-fill from information entered on the first tab.

Contractor: Name of General Contractor or Subcontractor, edit auto-fill as needed.

Direct Cost of Work:

Check here if explained on the Comment Sheet: If rates, unit costs or quantities may appear unreasonable compared to standard costs or quantities the reasons may be explained on the attached comment sheet and the box checked to indicate that there is an explanation.

A. Labor: Include the “wages paid” hourly direct labor and/or foreman necessary to perform the required change. “Wages paid” is the amount actually paid the employee, not the fully burdened charge rate used in the bid, etc. Supervisory personnel in district or home office shall not be included. Do not include the project superintendent, except as permitted by Section 7.2 of Supplementary Conditions. Supervisory personnel on the job-site, but with broad supervisory responsibility shall not be included as Direct Labor, except as permitted by Section 7.2 of Supplementary Conditions. Typically there will be only one superintendent on the job and his/her time shall not be included, except as permitted by Section 7.2 of Supplementary Conditions. Typically all other employees are eligible for inclusion. List by job title each person employed on the work, his/her hourly rate, the number hours work and the extended Total Cost. Do not list crews unless the rates for them are readily available in standard cost estimating references such as R. S. Means. Add the labor burden that was provided at the Pre-Construction conference and in compliance with the Contract Documents, and total the amounts in LABOR TOTAL.

B. Material: Include the acquisition cost of all materials directly required to perform the required change. List each material used in the work, the price per unit, name of the unit, the number of units used and the extended Total Cost. Add the tax rate and tax and total the amounts in MATERIAL TOTAL.

C. Equipment: Include the rental cost of equipment items necessary to perform the change. For company-owned equipment items, include documentation of internal rental rates submitted at the pre-construction conference. Charges for small tools, and craft specific tools are not allowed. List each piece of equipment used in the work, the rate by units of time (hour, day, week, etc.,) number of units of time the piece was in service on the work and the extended total cost. Add the tax rate, calculate the tax and total the amounts in EQUIPMENT TOTAL.

TOTAL DIRECT COST FOR THIS BREAKDOWN: Total of A. Labor, B. Material and C. Equipment. This is the amount that will be carried forward to the SUMMARY Sheet. This amount does **NOT** include Overhead and Profit. This will be added on the SUMMARY Sheet.

COMMENTS SHEET:

The COMMENTS SHEET uses the same heading as the SUMMARY and BREAKDOWN.

The COMMENTS SHEET includes three sections, one each for A. Labor, B. Materials and C. Equipment. These correspond to the sections in the BREAKDOWN. Each comment should be entered in the section to which it corresponds on the BREAKDOWN and numbered to correspond to the appropriate line. Comments are to used only to explain unusual rates, costs or quantities.

UNIT PRICE BREAKDOWN:

The UNIT PRICE BREAKDOWN uses the same heading as the BREAKDOWN.

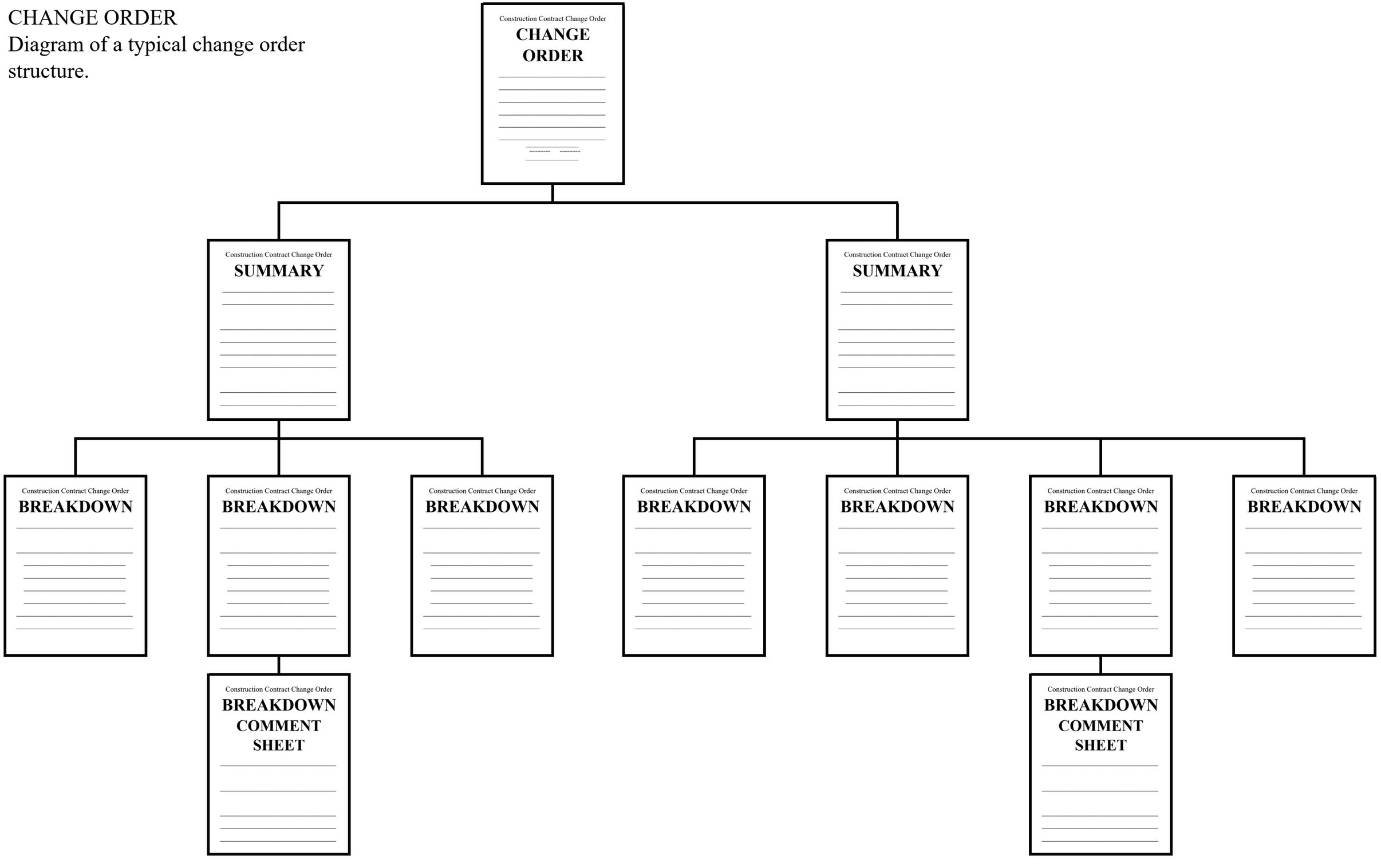
The UNIT PRICE BREAKDOWN is similar to the BREAKDOWN.

Unit Price Tabulation: Each unit price is listed along with its corresponding price and the number of units used in the work. The price and number of units are multiplied to provide the total cost of each unit price item. The pricing reference, such as the bid form for the project or a construction industry standard reference, must be cited for each unit price. This may be more fully described in "Reference Legend,"

Unit Price Total: Sum the unit prices to obtain the total cost for unit prices.

CHANGE ORDER

Diagram of a typical change order structure.



July 17, 2025

LABOR BURDEN-Etc.: *GC Company Name - date*
Also need for each subcontractor.

Project Number _____, Part __; F.xxxxxxxx
Project Title/Name:_____

FICA/Social Security = 6.20%
MEDICARE = 1.45%
FUTA = 0.6%
SUTA = Forward a copy of letter from Louisiana Workforce Commission = _____%
(Each year, the state unemployment office furnishes the rate specific to a company and communicated by way of a letter from the state's unemployment agency.)
WORKER'S COMPENSATION INSURANCE = Forward copy of Insurers Extension of Information sheet = _____%

Only above is applicable to determine Labor Burden rate = _____%.

Bond Rate = Forward copy of letter from bond provider = _____**%.**

COMPANY **LABOR TYPE** AND **RATE** (Hourly):

COMPANY **EQUIPMENT**: (Also - must have minimum of **two quotes from local suppliers/renters of area of project**. Need **daily, weekly, monthly** rental rates.)

LIST OF **SUB-CONTRACTORS** and **MAJOR VENDORS**:
(1.c. Information listed in Paragraph 7.1 of the Supplementary Conditions-required submittal of Sub-Contractors and all trades per SC Article 7.1.4.3.)

*Submit with support documentation for Designer's & Owner's review/approval **prior** to scheduling the Pre-Construction Conference per 1.b. and 1.c. of FPC 15. Pre-Construction Conference – See Pre-Construction Conference Agenda.*

❖ **NOT FOR RECORDATION PURPOSES** ❖

Facility Planning & Control

RECOMMENDATION OF ACCEPTANCE

TO: FACILITY PLANNING AND CONTROL
P.O. Box 94095
Baton Rouge, LA 70804-9095

FROM: _____
_____
_____
Design Firm Name and Address

DATE: _____
PROJECT NAME: _____
PROJECT NUMBER: _____ WBS No. _____
SITE CODE: _____ STATE ID: _____ CFMS/SRM #: _____
CONTRACTOR: _____
_____

ORIGINAL CONTRACT AMOUNT: $ _____
FINAL CONTRACT AMOUNT: $ _____
FINAL BUILDING AREA (SQ. FEET): _____

I certify that, to the best of my knowledge and belief, this project is substantially complete in accordance with the Plans and Specifications to the point where it can be used for the purpose which was intended. It is recommended that it be accepted.

DATE OF ACCEPTANCE: _____
CONTRACT DATE OF COMPLETION: _____
NUMBER OF DAYS (OVERRUN) (UNDERRUN) (As of Acceptance Date) _____
LIQUIDATED DAMAGES PER DAY STIPULATED IN CONTRACT $ _____
VALUE OF PUNCH LIST $ _____
Was part of project occupied prior to Acceptance? ☐ No ☐Yes, see attached Partial Occupancy Forms
ADA Certificate of Compliance Required? ☐ No ☐Yes, see attached form.
La. Building Code Certificate of Compliance Required? ☐ No ☐Yes, see attached form.

ROOF GUAR-MANUF: _____ START DATE: _____ END DATE: _____
ROOFER: _____ START DATE: _____ END DATE: _____

Signed: _____
DESIGNER

FOR USE OF PROJECT MANAGER:

Signed: _____
PROJECT MANAGER

c: User Agency

❖ **NOT FOR RECORDATION PURPOSES** ❖

❖ **NOT FOR RECORDATION PURPOSES** ❖

Facility Planning & Control

PARTIAL OCCUPANCY

PROJECT NAME:

PROJECT LOCATION:

PROJECT / PART NUMBER: CFMS / SRM No.

WBS NUMBER:

CONTRACTOR:

USER AGENCY:

The below described portion of subject project is, to the best of my knowledge and belief, complete to a point where the User desires to use in according with the Contract Documents.

DATE OCCUPIED: _____ .

WARRANTY items covered by Occupancy:

_____
Designer Date

_____
Contractor Date

_____
Facility Planning and Control Date

Punch List: Attached ❑

None ❑

c: User Agency, ORM

❖ **NOT FOR RECORDATION PURPOSES** ❖

CERTIFICATE OF COMPLIANCE

with

Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines

TO: STATE OF LOUISIANA
DIVISION OF ADMINISTRATION
FACILITY PLANNING AND CONTROL
P.O. Box 94095
Baton Rouge, LA 70804-9095

FROM: _____

_____

_____

Design Firm Name and Address

PROJECT NAME: _____

_____

PROJECT No.: _____

WBS No.: _____

SITE CODE: _____ STATE ID: _____

DATE OF ACCEPTANCE: _____

I, _____ certify that, to the best of my knowledge and belief, this project has been constructed in compliance with the Americans with Disabilities Act and Architectural Barriers Act Accessibility Guidelines as reviewed by the fire marshal.

_____ Date: _____

Designer Signature

State of Louisiana
DIVISION OF ADMINISTRATION
Facility Planning and Control

CERTIFICATE OF COMPLIANCE
with
Louisiana Building Code for State Owned Buildings

TO: STATE OF LOUISIANA
DIVISION OF ADMINISTRATION
FACILITY PLANNING AND CONTROL
P.O. Box 94095
Baton Rouge, LA 70804-9095

FROM: _____
_____
_____
Design Firm or Owner/User Name and Address

PROJECT NAME: _____
_____

PROJECT No.: _____

WBS No.: _____

SITE CODE: _____ STATE ID: _____

DATE OF ACCEPTANCE: _____

I, _____ certify that, to the best of my knowledge and belief, this project has been constructed in compliance with the construction documents determined to be satisfactory by the State of Louisiana, Division of Administration, Office of Facility Planning and Control.

_____ Date: _____
(Signature of Designer or Owner/User)

Facility Planning & Control

4. RECOMMENDED AGENDA FOR ROOFING CONFERENCES

Project Name: _____

Project Number & WBS: _____

Conference Location: _____ Date: _____

Type of Conference: _____ Preliminary _____ Pre-Application ___ Final Inspection

Designer: _____

Roofing Contractor: _____

General Contractor: _____

CONFERENCES ATTENDEES:

NAME	ORGANIZATION	PHONE #	EMAIL ADDRESS

AGENDA FOR PRELIMINARY ROOFING CONFERENCE

PURPOSE: Establish a direct line of communication, iron out initial questions regarding the project and to review project submittal requirements.

TIMING: The meeting should be held shortly after award of the Contract and at least six weeks prior to the anticipated start of roofing. Re-Roofing Projects may combine with Pre-Const. Conf. (ITB § 15).

1. A complete set of Contract Documents (plans and specifications) to be available for review.

2. All meeting minutes to be furnished by the Designer to all parties within 7 days. Establish project record keeping procedures.

3. Review tentative progress schedule for roofing. Set approximate date.

4. Review roofing system and insulation requirements. Size (4'x4' adhered, 4'x8' Mech. Fastened) and Thickness (R-Value), Staggered Joints

5. Weather considerations as they may apply to the project roofing installation.

6. Temporary roofing guidelines for the project. Who and when, will final decision be made, if necessary.

7. Inspection and Testing Requirements:

   _____

   Name of Inspection Firm:
   Name of inspector:
   Phone:

   _____

   a. On-Site Inspection - Discuss project requirements.
   b. Laboratory Tests

8. Roof Deck:

Type and Thickness: (if Lt. Wt. Conc. has a Pull Test been done?)

_____

Slope:____Location and Type of Drains:

_____

Tentative Schedule for Installation:

_____

Nailers, curbs, and sheet metal must be completed prior to roofing application. Review CD Details, and discuss if raising Equip. Curbs is required or not.

9. Discuss material storage areas, dumpster location, worker parking, and equipment set-up locations. Review requirements.

10. Specific submittals from the Roofing Contractor:

   a. Material approval list
   b. Shop drawings (if any)
   c. Product material brochures and samples
   d. Manufacturer's Guarantee review for compliance with specifications (20-Year State Warranty)
   e. Manuf. Assembly Letter (required for Pre-App. Conf. as well as materials on site)

11. Specific project detail discussion. (Include perimeter wall construction and rooftop mechanical equipment details, necessity of disconnecting any Exist. Rooftop Equip.)

12. Other:

_____

13. Review above items briefly and establish date for tentative Pre-Application Conference. (Manuf. Assembly Letter and materials therein required on site prior to scheduling conference). Roof Manuf. Rep. and FP&C Roof Consultant to be scheduled to attend.

AGENDA FOR ROOFING PRE-APPLICATION CONFERENCE

PURPOSE:

To verify readiness of the project structure

To walk site with Roof Manuf. Assembly Letter in hand, verifying materials on site comply.

To scan last minute details, changes or corrections

To review anticipated schedule of progress

TIMING: Following receipt of Roof Manuf. Assembly Letter, all materials on letter delivered to site, and prior to Roofing Work.

ATTENDANCE: List attendees
(Required attendees: FP&C Project Manager, FP&C Roofing Consultant, Roof Manuf. Rep., User Agency Contact, Designer, Contractor Superintendent.)

1. Copies of approved submittals should be available for review. Are any material changes required due to availability problems or other? Reminder that formal approvals are still required.

2. Review minutes of Preliminary Conference.

3. Discuss revised Roofing Application Schedule.

4. Check equipment set-up and on-site material storage.

5. Deck Readiness:
   a. Any required roof deck certifications must be in order
   b. Rooftop inspection by those in attendance
   c. Drain hookups complete
   d. Curbs, nailers, roof deck penetrations, perimeter edges and mechanical equipment - should all be set and complete. Roof Drain Pipes are verified free of Demo Debris

6. Review roof system, including insulation above deck. Discuss the required application of each to the other components.

   a. (2) Layers Polyiso Insulation (staggered), (1) Layer Cover Board (any special techniques required?)
   b. Mechanical or adhesive attachments (Mech. Fasteners = 4'x8' or Adhesion = 4'x4' board size)
   c. Vapor Retarders
   d. Flashings
   e. Saddles and/or crickets
   f. Venting
   g. Sheet metal

7. Phase Construction Guidelines for project. Factors affecting guidelines include local practices, climate and weather considerations. Tie-offs at days end.

8. Temporary roofing final decisions.

9. Housekeeping, material handling and finished work protection requirements.

10. Inspection and testing requirements - State Roofing Consultant at Final Inspection; Roof Manuf. Inspector as required and at Final Inspection.

11. Project changes in plans, specifications or procedures to be followed - discuss and establish who can approve and how documented.

12. Contractor must provide State 2-Yr Guarantee, and perform 1 & 2 Year Inspections. Roof Manuf. must provide 20-Yr Warranty. Pre-Finished Metal Manuf. must provide 20-Year Finish Warranty.

NOTES

AGENDA FOR ROOFING FINAL INSPECTION

PURPOSE: To assure 100% completion of contract requirements.

TIMING: Prior to the Roofing Contractor concludes his work at the site.

1. Attendance must include those in attendance at the Pre-Application Conference.

2. Complete rooftop walk over and review:

   a. Perimeter edges
   b. Walls
   c. Curbs and other equipment
   d. Drains
   e. Rooftop penetrations
   f. Site cleanup
   g. Sheet metal
   h. Any special conditions

3. Final Punch List establishment of items to be completed. Copies to all parties. Attached to Meeting Minutes issued by Designer

4. Summary of project records. Organize for final file. Wrap up any loose ends.

5. Stress importance of Bi-Annual (and after storm) Maintenance to User-Agency (keep file for claim)

6. Discuss responsibility for roof system protection until project completed. Responsibility for coordination usually rests with General Contractor. Any damage or additional work to be conducted by original Roofing Contractor in order to keep original guarantee valid.

7. Acceptance by the state will not be issued without submittal and approval of fully executed guarantees for each type of roof installed, which shall include, but not necessarily be limited to the following applicable forms, which can be found on the Instructions to Designers page of the FPC Website:

   a. *Recommendation of Acceptance (ROA)*: (Designer's Responsibility)
   b. *Letter of Concurrence*: Concurring in Designer's ROA (User Agency's Responsibility)
   c. *Roof Completion Information Form*: with a Roof Plan on 8-1/2"x11" of Individual State ID's or different Material Roof (Designer's Responsibility)
   d. *Roof Guarantee/Warranty (2)*: (Contractor's Responsibility)
      i. 20-Year Manuf. Membrane Warranty (State Form in ITD § 28e; 28d for Metal Roof)
      ii. 2-Year Contractor Warranty R-1 (Sub & GC) or R-2 (GC) (State Forms in ITD § 28a, 28b); 28c for Metal Roof)
   e. *Final Cost & Const. Data Report:* Div. 7 Primarily, *attached to "DESIGNER LETTER" E-mail when project began* (Designer's Responsibility)
   f. *As-Builts:* Const. that changed from Contract Docs, Marked-up Job Prints delivered to designer (Contractor's Responsibility)
   g. *Final Documents delivered:* drawings & specs marked "*RECORD DOCUMENTS"* as Hard-copy, as well as PDF & CAAD DWG Files (include Line Weight Files) on Thumb-Drive to FP&C & User Agency (Designer's Responsibility)

NOTES

ROOF COMPLETION INFORMATION

Facility Name: _____ Building Name: _____

Site Code: _____ State I.D: _____ Project No. & WBS: _____

☐New Roof ☐Total Replacement ☐Partial Replacement Roof Section(s): _____

☐ Roof Plan Attached (required)

Roof Type:
1. SBS Mod. Bit.
2. PVC
3. TPO
4. Metal
5. Tile
6. Shingle
7. Cedar Shake
8. _____

Surfacing Type:
1. Ceramic Granules
2. Smooth Uncoated
3. Modified Asphalt
4. Silicone
5. Acrylic
6. Urethane
7. Aluminum
8. Pre-Finished Paint
9. _____

Connection Type:
1. Cold Process
2. Hot Asphalt
3. Torched Asphalt
4. Mechanical Fastener
5. _____

Drainage Type:
1. Over the Edge
2. Roof Drains
3. Perimeter Gutter
4. Internal Gutter
5.

Total Penetrations: _____

No. of Plies: _____

Slope:
1. 1/4 in./ft.
2. 1/8 in./ft.
3. 1/2 in/ft.
4. _____

Deck Type:
1. Structural Concrete
2. Gypsum
3. Metal
4. Lt. Wt. Concrete
5. Cement Fiber
6. Wood
7.

Insulation:
1. Polisocyanurate
2. Cover Board
3. Fiberglass
4. Wood Fiber
5. _____

Insulation Thickness: _____

Roof Area (sq. ft.) _____

Roofing Contractor (2-Year State Guarantee):

_____

Address:

_____

_____

_____

Roofing Contractor's Telephone: _____

Roofing Contractor's Email: _____

Warranty Beginning Date:
(same as Acceptance Date)

_____

Warranty Ending Date:

_____

Roofing Manufacturer (20-Year State Warranty):

_____

Address:

_____

_____

_____

Roofing Manufacturer's Telephone: _____

Roofing Manufacturer's Email: _____

Roof Warranty Number:

_____

Beginning Date:
(same as Acceptance Date)

_____

Ending Date:

_____

R-3 ROOFING GUARANTEE (Metal)

OWNER: STATE OF LOUISIANA OFFICE OF FACILITY PLANNING AND CONTROL
POST OFFICE BOX 94095 CAPITOL STATION
BATON ROUGE, LOUISIANA 70804-9095

Whereas _____

Address _____

Telephone (_____)_____ Email _____

herein called the Contractor, has provided pre-formed, pre-finished metal roofing, flashing, accessories and miscellaneous items required for a complete roof system installation in accordance with the Contract Documents for the PROJECT:

Name of Project: _____

Project No. & WBS: _____

User Agency: _____

Location/Address: _____

Name and Type of Building(s): _____ State I.D. _____

Type of System: (Standing Seam, Flat Seam, etc.) _____

Total Roof Area: _____ SF; Total Length of Ridge _____LF

Total Length of Valley: _____LF; Total Length of gutter/fascia trim: _____LF

Date of Acceptance _____Two year Guarantee Expiration _____

AND WHEREAS the Contractor has contracted to guarantee said work against water entry from faulty or defective materials and workmanship for the designated Guarantee period of TWO **(2) YEARS from the Acceptance Date** of the Project;

NOW THEREFORE the Contractor guarantees, subject to the terms and conditions herein set forth, that during the Guarantee Period the Contractor will at his own cost and expense, make or cause to be made with approved procedures and materials such repairs to or replacements of said work (including any wetted thermal insulation) resulting from water entry or faults or defects of said Work as are necessary to maintain said Work in watertight conditions and further, respond on or within TWO (2) working days upon written notification of leaks or defects by the Owner/User Agency.

This Guarantee is made subject to the following terms and conditions:

1. Damage to the roof caused by the following items are excluded from this warranty: wind exceeding 73 mph, lightning, hail, fire or physical damage from falling or wind-blown objects. When the Work has been damaged by any of the foregoing causes, the Guarantee will be null and void until such damage has been repaired by the Roofing Contractor, and until the cost and expense thereof has been paid by the Owner or another responsible party so designated.

2. During the Guarantee Period, if the Owner/ User Agency allows alteration of the Work by anyone other than a Contractor approved in writing by the original Contractor and/or Roofing Material Supplier prior to the work being performed, including cutting, patching and maintenance in connection with penetrations, attachment of other work, and positioning of anything (i.e. signs) onto the roof, this Guarantee shall become null and void as of the date of said alterations. If the Owner/ User Agency engages the original Contractor for said alterations, the Guarantee shall be maintained in force unless the Contractor presents written notification to the Owner that the intended work will likely damage or cause deterioration of the base work, thereby justifying a termination of the original Guarantee.

3. The Owner/User Agency shall promptly notify the Contractor in writing of observed, known or suspected leaks, defects, or condition deterioration and shall afford a reasonable opportunity for the Contractor to inspect the work and examine evidence of such leaks, defects or deterioration.

4. This Guarantee is recognized to be the only guarantee of the Contractor of said work, and shall not operate to restrict or cut-off the Owner from any other remedies and recourse lawfully available to him in case of roofing failure to any cause or degree. Specifically, this Guarantee shall not operate to relieve the Contractor of his responsibility for the performance of the original work.

IN WITNESS THEREOF, this instrument has been duly executed

this _____day of _____, 20____.

Contractor's Signature: _____

Typed Name: _____

Telephone (_____)_____ Email _____

Witness:_____ Witness:_____

And if applicable, is countersigned by the following Sub Contractor, Installer, or other party (as indicated) who acted as agent or represented the Contractor during the performance of the work:

Countersignee Name: _____
(*Type or Print)*

Date: _____ Signature: _____

Representing: _____

Address:_____

Telephone (_____)_____ Email _____

Witness:_____ Witness:_____

Facility Planning and Control
State of Louisiana

TWENTY (20) YEAR WEATHERTIGHTNESS
METAL ROOF SYSTEM - LIMITED WARRANTY

We, Manufacturer the manufacturer; warrants to the State of Louisiana herein referenced as "Owner" of the building described below that subject to the terms, conditions, limitations and warranty responsibility stated herein ; Manufacturer warrants with no dollar limit (NDL) the undersigned Contractor workmanship and material defects, and will repair any leaks in the Manufacturer roofing system (Roofing System); and further, agrees to make provisions for satisfactorily drying all wetted thermal roof insulation caused by said leak(s), of the installed roof over the life of this TWENTY (20) YEAR WARRANTY commencing with the date of Acceptance of the Project (as defined in the Contract Documents).

Satisfactory repair of reported leaks shall not serve to extend the term of the original 20-Year Warranty period for either the repair or the entire Roof System, but rather serve to maintain the Roof System weathertightness condition for the entire term of the original warranty.

Neither Manufacturer nor undersigned Contractor makes any other warranty whatever, expressed or implied. All implied warranties of merchantability and all implied warranties of fitness for any particular purpose which exceed or differ from the warranties herein expressed are disclaimed by each and all of said parties and are hereby excluded from this 20-Year Weathertightness Limited Warranty.

In no event shall Manufacturer be held liable for any commercial loss, claims for labor or consequential damages of any other type not specifically referenced herein, whether owner's claim be based in contract, tort, or strict liability.

TERMS, CONDITIONS, LIMITATIONS

1. A "Leak" is defined as water entry into any location where water entry is not specifically planned for. This can include insulation, cornices, attic spaces and other portions of the building assembly. Water entry through fastener holes, all flashings including valley, hip, ridge, closure, rake, wall runner, eave, curb, pipe penetration and other penetration flashings, and the roof panels and seams (side and end) are to be considered "leaks" as pertains to this weathertightness warranty.

2. Owner shall provide Manufacturer with written notice within THIRTY (30) days of discovery of any leaks in the Roof System; after which date, the principal to this warranty shall be expected to respond to said leak report within a period of TEN (10) working days.

    a) Failure to respond, shall enable the Owner to engage service of "others" to address the problem without jeopardizing Owner's protection under terms of the original warranty.
    b) Further, by Manufacturer's failure to respond as specified, subjects manufacturer to liability for full reimburse to the Owner for all costs incurred to engage the services of "others" in order to protect the building from further damage by roof leak(s).
    c) Manufacturer cannot be held responsible for lack of performance or liable under the terms of this warranty due to Owner's failure to report claims as specified.

3. After a leak report is filed; Manufacturer shall determine whether the leak is caused by defects in manufactured material or in the workmanship and affect the Roof System repair in accordance with repair obligations herein. In the event a determination is made that neither defect in manufactured material or workmanship is at fault, the Owner shall be so advised in writing and permitted to exercise other remedies without jeopardy to provisions of the original warranty.

4. The Manufacturer shall not have any liability under the terms of this 20-Year Weathertightness Warranty for any NDL repair or replacement caused by one or more of the following:

   a) Acts of Nature - including but not limited to; lightning, hurricane, tornado, earthquake, hailstorm and falling trees or limbs.
   b) Deterioration caused by marine (salt water) atmosphere or by regular spray of either salt or fresh water.
   c) Corrosion caused by heavy fall out or exposure to corrosive chemicals, ash or fumes from chemical plants, foundries, plating works, kilns, fertilizing manufacture and paper manufacturing plants - if either cause is located less than one-half mile radius distant from the building.
   d) Deterioration caused by corrosive or condensates generated or released from within the building itself.
   e) Damages caused by workers or work activity on the roof after issuance of the warranty.
   f) Structural failures affecting (but not part of) the Roof System.
   g) Unauthorized alterations or modifications of the Work by anyone other than a Contractor agreed to in writing by all parties to this warranty.
   h) Failure of the Owner to exercise reasonable care and maintenance.

5. During the Term of this warranty; and within 72 hours of formal request, the Owner shall permit Manufacturer, or manufacturer's agent access to the roof during regular business hours.

6. Failure of either party to exercise or enforce specific terms, conditions or provisions shall not be construed to be a waiver of same.

7. The Manufacturer shall not be responsible for consequential damage or loss to the building, its contents, or other material as a provision of this warranty.

8. The Manufacturer shall not have any liability or responsibility at any time for, or as a consequence of any condensation or underside corrosion which is or was caused at anytime by any condensation resulting from either or both of the following:

   a) Inadequate ventilation of the attic space between the roof panel and insulation, when insulation is installed on top of existing roof.
   b) The use of inadequate vapor barrier where the insulation is installed immediately beneath roof panels.

9. The Nineteenth Judicial Court in and for the Parish of East Baton Rouge, State of Louisiana shall have sole jurisdiction in any action brought as a result of this warranty by any party hereto.

10. This Warranty instrument supersedes and is in lieu of any and all other expressed or implied warranties that are or may be in conflict with terms and conditions stated herein.

11. A fully executed original of this Warranty is required prior to recommendation of acceptance, and Acceptance of the project.

WARRANTY RESPONSIBILITY

FIRST (1st.) year through the TWENTIETH (20th) year from date of Acceptance of the project by Roof System Manufacturer whose legal entity is Manufacturer; except that the first recourse of the Owner for Warranty Benefits during Year 1 and Year 2 after date of Project Acceptance will be the Contractor per provisions of Roofing Guarantee R-3 (Metal).

EXCEPT AS EXPRESSLY PROVIDED HEREIN, Manufacturer MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WITH RESPECT TO MATERIALS COVERED HEREBY, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, NOR DOES SELLER MAKE ANY WARRANTY OR ASSUME ANY OBLIGATION WITH RESPECT TO THE VALIDITY OF ANY PATENTS, DESIGNS, COPYRIGHTS OR TRADEMARKS WHICH MAY COVER SUCH GOODS EXCEPT; THAT THE OWNER SHALL HAVE THE RIGHT TO RELY ON SAME BY REPRESENTATION OF THE MANUFACTURER THAT BY OFFERING THE MATERIAL, ROOF SYSTEM AND MISCELLANEOUS ITEMS FOR THE PURPOSES OF THIS PROJECT THERE IS NO VIOLATION OF THE RIGHTS OF OTHER PARTIES WITH RESPECT TO PATENTS, DESIGNS, COPYRIGHTS OR TRADEMARKS, FURTHER; THE CONDITIONS OF LIABILITY, RIGHTS, OBLIGATIONS AND REMEDIES OF THE PARTIES RELATING TO CLAIMS ARISING FROM DEFECTIVE GOODS SHALL BE GOVERNED EXCLUSIVELY BY THE TERMS HEREOF: THIS WARRANTY MAY NOT BE CHANGED ORALLY.

IN CONSIDERATION FOR PAYMENT RECEIVED, THIS WARRANTY IS TENDERED FOR THE BENEFIT OF THE OWNER AND IS NOT TRANSFERABLE OR ASSIGNABLE WITHOUT THE WRITTEN CONSENT OF THE MANUFACTURER Manufacturer .

THIS WARRANTY REQUIRES THE ORIGINAL SIGNATURES OF AN OFFICER OF THE MANUFACTURER, AND THREE FULLY EXECUTED COPIES WILL BE PROVIDED TO THE OWNER AS A PREREQUISITE FOR PROJECT ACCEPTANCE. THE OWNER'S SIGNATURE SHALL NOT BE A REQUIREMENT FOR IMPLEMENTATION OF, OR CAUSE TO VALIDATE THE WARRANTY.

A SEPARATE AND INDEPENDENT WARRANTY SHALL BE ISSUED FOR EACH BUILDING OR INDEPENDENT ROOF SYSTEM IN THE CASE OF MULTIPLE BUILDINGS OR MIXED ROOFED PROJECTS.

PROJECT DATA / SIGNATORS

Building/Project Description: _____

Roof Type and Quantity: _____

Location: _____

La. State I.D. (if known): _____

Site Code: _____

La. State Project Number & WBS: _____
Date of Project Acceptance and Commencement of Warranty: _____ Ends: _____
Manufacturer:

Manufacturer

S_____ Title_____ Date_____

ADDITIONAL PARTIES FOR FILE AND RECORD

File Reference:
Contractor or
Roofing Contractor
Address:

S _____

Title_____ Date: _____

File Reference #2:
Contractor or
Roofing Contractor
Address:

S _____

Title _____ Date: _____

Direct to:

STATE of LOUISIANA (Owner)
DIVISION OF ADMINISTRATION
Facility Planning and Control
Statewide Roofing Program
PO Box 94095
Baton Rouge, Louisiana 70804-9095

////////////////////////// END 20- YEAR WEATHERTIGHTNESS WARRANTY \\\\\\\\\\\\\\\\\\\\\\\\\\

FP&C Project Managers & To Whom It May Concern
METAL ROOF SYSTEM 20 - YEAR WEATHERTIGHTNESS
No Dollar Limit (NDL) WARRANTY

To: FP&C PROJECT MANAGERS & TO WHOM IT MAY CONCERN

From: STATE of LOUISIANA, DIVISION OF ADMINISTRATION
FACILITY PLANNING AND CONTROL
STATEWIDE ROOFING PROGRAM SECTION

Re: METAL ROOF SYSTEM 20 - YEAR WEATHERTIGHTNESS
No Dollar Limit (NDL) WARRANTY

Present policy will require that new metal roofing system installation on either new construction projects; or, retrofit construction projects; or, reroofing construction projects will require a 20-Year Manufacturer's Weathertightness (or, Weathertight) (or, No Leak) No Dollar Limit Warranty to be provided.

Since the inception of this policy, Facility Planning and Control has received numerous warranties with varying provisions unrelated to the State of Louisiana, provisions contradictory to the best interest of the State of Louisiana (and in some cases for Contractors as well) or just simply unrelated to the State's general project requirements. In an effort to promote a clearer understanding of what is required, the Statewide Roofing Program Section has compiled and edited provisions of currently available Industry Standard warranties and has composed an acceptable warranty format required for use on State of Louisiana projects.

The following FOUR (4) page "Sample Warranty" is to be included in the Project Manual as reference of the acceptable warranty. Bidders are to be advised that this warranty, complete and fully executed must be used; or, at the option of the successful bidder (or metal roof system manufacturer) a "Manufacturer's Warranty" may be used provided it is written exactly as the attached State version.

Manufacturer's Warranties are to be approved for use on a project by project basis by FP&C prior to Bidding. Submittal of all proposed warranties shall be per Instructions to Bidders; Article 4. BID DOCUMENTS; 4.3 "Substitutions". Failing to receive Pre-Bid Approval will not relieve manufacturer from compliance with provisions of "Sample Warranty". All Bidders are advised that an approved warranty is required before completed project Acceptance can be given.

Significant points regarding warranty provisions:

* "No Dollar Limit" (NDL) warranties are consistent with the present requirements of the State for low-slope and other roofing systems. Other "Limited Warranties" offered base their total value on: a) cost of materials; b) original Owner's cost; c) a form of prorated cost; and d) other undefined limitations related to costs.

* The "Term" of the warranty is stated to be 20 years (not 18 years beginning the second year after acceptance); however, we have acquiesced by agreeing to rely initially on R-3 (Contractor's Warranty) for the first two years – see page 3, "Warranty Responsibility".

* We have reasonably excluded manufacturer liability for Acts of Nature, and other uncontrollable circumstances. We HAVE NOT absolved the manufacturer from poor workmanship (as appeared in some warranties) because this is the reason manufacturer's certify and approve contractors and installers in the first

place. We've excluded circumstances like "damage by strong gales", "unpaid bills for supplies, installation and services", and the like.

* The venue for dispute resolution is the 19th Judicial Court in and for the Parish of East Baton Rouge, State of Louisiana.

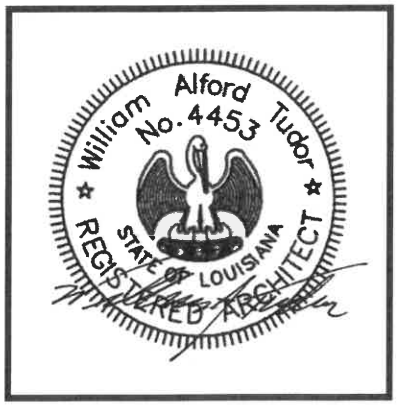
* We have included a provision for drying of wet insulation caused by a roof leak as a warranty responsibility – other damages may occur but are difficult to assign total responsibility. An engineered provision for drying of insulation wetted by roof leaks is to be agreed on by the State prior to implementation.

* Details about reporting and principal's response are typical of most warranties except we've protected the Owner's right to safeguard the building without risk of voiding the warranty.

* Warranty Responsibility – a typical warranty absolves the manufacturer from patent & design copyright violations, etc. As buyer, we have the right to rely on the Seller to have taken care of that business and absolve the State from claim action. False claims as to merchantability and suitability are better tied to Designer recommendations/specifications.

This information is for your use. Further refinements of this warranty may occur; please consult with your project manager to obtain the latest version. Please forward any and all comments you may have (or, those you may receive from others) - it is our intent to provide FP&C with a fair, manageable and enforceable warranty document.

DIVISION 1
GENERAL REQUIREMENTS



SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Contract description.
2. Work by Owner or other Work at the Site.
3. Owner-furnished products.
4. Contractor's use of Site and premises.
5. Future work.
6. Work sequence.
7. Owner occupancy.
8. Permits.

1.2 CONTRACT DESCRIPTION

A. Work of the Project includes replacement of multiple buildings including some foundation replacement.

B. Perform Work of Contract under stipulated sum Contract with Owner according to Conditions of Contract.

1.3 WORK BY OWNER OR OTHERS (Not Used)

1.4 OWNER-FURNISHED PRODUCTS

A. Owner's Responsibilities:

1. Arrange for and deliver Owner-reviewed Shop Drawings, Product Data, and Samples to Contractor.
2. Arrange and pay for delivery to Site.
3. Upon delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:

1. Review Owner-reviewed Shop Drawings, Product Data, and Samples.
2. Receive and unload products at Site; inspect for completeness or damage jointly with Owner.
3. Handle, store, install, and finish products.
4. Repair or replace items damaged after receipt.

1.5 CONTRACTOR'S USE OF SITE AND PREMISES

A. Use of Site and premises is not limited.

1.6 FUTURE WORK (Not Used)

1.7 WORK SEQUENCE

A. Construct Work in stages to allow partial Owner's occupancy of each finished building. Coordinate construction schedule and operations with Architect/Engineer:

B. Sequencing of Construction Plan: Before start of construction, submit three copies of construction plan regarding phasing of Work for acceptance by Owner. After acceptance of plan, construction sequencing shall comply with accepted plan unless deviations are accepted by Owner in writing.

1.8 OWNER OCCUPANCY (Not Used)

1.9 PERMITS

A. Furnish all necessary permits for construction of Work

1.10 CONTRACT DOCUMENT CONVENTIONS

A. The intent of the Contract Documents is to include all items necessary for proper operation, execution, and completion of work. This includes anything reasonably inferable as being necessary to produce the indicated result.

B. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. Neither drawings nor specifications take precedence. If a discrepancy occurs, the most stringent requirement will govern.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 011000

SECTION 012000 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Cash allowances.

B. Contingency allowances.

C. Testing and inspection allowances.

D. Schedule of Values.

E. Application for Payment.

F. Change procedures.

G. Defect assessment.

H. Unit prices.

I. Alternates.

1.2 CASH ALLOWANCES (Not Used)

1.3 CONTINGENCY ALLOWANCES (Not Used)

1.4 TESTING AND INSPECTION ALLOWANCES (Not Used)

1.5 SCHEDULE OF VALUES

A. Submit printed schedule on AIA G703 - Continuation Sheet for G702

B. Submit Schedule of Values within 15 days after date of Owner-Contractor Agreement.

C. Format: Use Table of Contents of this Project Manual. Identify each line item with number and title of major Specification Section.

D. Include within each line item, direct proportional amount of Contractor's overhead and profit.

E. Revise schedule to list approved Change Orders with each Application for Payment.

1.6 APPLICATION FOR PAYMENT

A. Submit three copies of each Application for Payment on AIA G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet for G702.

B. Content and Format: Use Schedule of Values for listing items in Application for Payment.

C. Submit updated construction schedule with each Application for Payment.

D. Submit submittals with transmittal letter as specified in Section 013300 - Submittal Procedures.

E. Substantiating Data: When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:

1. Current construction photographs specified in Section 013300 - Submittal Procedures.
2. Partial release of liens from major Subcontractors and vendors.
3. Record Documents as specified in Section 017000 - Execution and Closeout Requirements, for review by Owner, which will be returned to Contractor.
4. Affidavits attesting to off-Site stored products.
5. Construction Progress Schedule, revised and current as specified in Section 013300 - Submittal Procedures.

1.7 CHANGE PROCEDURES

A. Submittals: Submit name of individual who is authorized to receive change documents and is responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. Carefully study and compare Contract Documents before proceeding with fabrication and installation of Work. Promptly advise Architect/Engineer of any error, inconsistency, omission, or apparent discrepancy.

C. Requests for Interpretation (RFI) and Clarifications: Allot time in construction scheduling for liaison with Architect/Engineer; establish procedures for handling queries and clarifications.

1. Use AIA G716 - Request for Information for requesting interpretations.
2. Architect/Engineer may respond with a direct answer on the Request for Interpretation form.

D. Architect/Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on AIA G710.

E. Architect/Engineer may issue Proposal Request AIA G709including a detailed description of proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change. Contractor will prepare and submit estimate within 14 days.

F. Contractor may propose changes by submitting a request for change to Architect/Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Sum/Price and Contract Time with full documentation.

G. Stipulated Sum/Price Change Order: Based on Proposal Request AIA G709 and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Architect/Engineer.

H. Construction Change Directive: Architect/Engineer may issue directive, on AIA G714 - Construction Change Directive signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.

I. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Architect/Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.

J. Maintain detailed records of Work done on time and material basis. Provide full information required for evaluation of proposed changes and to substantiate costs for changes in the Work.

K. Document each quotation for change in Project Cost or Time with sufficient data to allow evaluation of quotation.

L. Change Order Forms: AIA G701 - Change Order.

M. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

N. Correlation of Contractor Submittals:

1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
2. Promptly revise Progress Schedules to reflect change in Contract Time, revise subschedules to adjust times for other items of Work affected by the change, and resubmit.
3. Promptly enter changes in Record Documents.

1.8 DEFECT ASSESSMENT

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

B. If, in the opinion of Architect/Engineer, it is not practical to remove and replace the Work, Architect/Engineer will direct appropriate remedy or adjust payment.

C. The defective Work may remain, but unit sum/price will be adjusted to new sum/price at discretion of Architect/Engineer.

D. Defective Work will be partially repaired according to instructions of Architect/Engineer, and unit sum/price will be adjusted to new sum/price at discretion of Architect/Engineer.

E. Individual Specification Sections may modify these options or may identify specific formula or percentage sum/price reduction.

F. Authority of Architect/Engineer to assess defects and identify payment adjustments is final.

G. Nonpayment for Rejected Products: Payment will not be made for rejected products for any of the following reasons:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from transporting vehicle.
4. Products placed beyond lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.

1.9 UNIT PRICES (Not Used)

1.10 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement. The Owner-Contractor Agreement may identify certain Alternates to remain an Owner option for a stipulated p

B. eriod of time.

C. Coordinate related Work and modify surrounding Work. Description for each Alternate is recognized to be abbreviated but requires that each change shall be complete for scope of Work affected.

1. Coordinate related requirements among Specification Sections as required.
2. Include as part of each Alternate: Miscellaneous devices, appurtenances, and similar items incidental to or necessary for complete installation.
3. Coordinate Alternate with adjacent Work and modify or adjust as necessary to ensure integration.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 012000

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quality assurance.

B. Product options.

C. Product substitution procedures.

1.2 QUALITY ASSURANCE

A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.

B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.

C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless substitution has been accepted and approved in writing by Owner.

1.3 PRODUCT OPTIONS

A. See Section 016000 - Product Requirements.

1.4 PRODUCT SUBSTITUTION PROCEDURES

A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during Bidding period.

B. Architect/Engineer will consider requests for substitutions only within 30 days after date established in Notice to Proceed.

C. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.

D. Document each request with complete data, substantiating compliance of proposed substitution with Contract Documents, including:

1. Manufacturer's name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
2. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
3. Reference to Article and Paragraph numbers in Specification Section.
4. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
5. Changes required in other Work.
6. Availability of maintenance service and source of replacement parts as applicable.

7. Certified test data to show compliance with performance characteristics specified.
8. Samples when applicable or requested.
9. Other information as necessary to assist Architect/Engineer's evaluation.

E. A request constitutes a representation that Contractor:

1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
2. Will provide same warranty for substitution as for specified product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Will coordinate installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
6. Will reimburse Owner and Architect/Engineer for review or redesign services associated with reapproval by authorities having jurisdiction.

F. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request or when acceptance will require revision to Contract Documents.

G. Substitution Submittal Procedure:
1. Submit three copies of Request for Substitution for consideration. Limit each request to one proposed substitution.
2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
3. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

1.5 INSTALLER SUBSTITUTION PROCEDURES

A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during Bidding period.

B. Architect/Engineer will consider requests for substitutions only within 30 days after date established in Notice to Proceed.

C. Document each request with:

1. Installer's qualifications.
2. Installer's experience in work similar to that specified.
3. Other information as necessary to assist Architect/Engineer's evaluation.

D. Substitution Submittal Procedure:

1. Submit three copies of Request for Substitution for consideration. Limit each request to one proposed substitution.
2. Architect/Engineer will notify Contractor in writing of decision to accept or reject request.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 012500

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Coordination and Project conditions.

B. Preconstruction meeting.

C. Site mobilization meeting.

D. Progress meetings.

E. Preinstallation meetings.

F. Closeout meeting.

G. Alteration procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of various Sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing operating equipment in service.

C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit as closely as practical; place runs parallel with lines of buil

D. ding. Use spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

1. Coordination Drawings: Prepare as required to coordinate all portions of Work. Show relationship and integration of different construction elements that require coordination during fabrication or installation to fit in space provided or to function as intended. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are importa

2. nt.

E. Coordination Meetings: In addition to other meetings specified in this Section, hold coordination meetings with personnel and Subcontractors to ensure coordination of Work.

F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.

G. Coordinate completion and clean-up of Work of separate Sections in preparation for Substantial Completion and for portions of Work designated for Owner's occupancy.

H. After Owner's occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of Owner's activities.

1.3 PRECONSTRUCTION MEETING

A. Architect/Engineer will schedule and preside over meeting after Notice of Award.

B. Attendance Required: Architect/Engineer, Owner, major Subcontractors, and Contractor.

C. Minimum Agenda:

1. Distribution of Contract Documents.
2. Submission of list of Subcontractors, list of products, schedule of values, and Progress Schedule.
3. Designation of personnel representing parties in Contract, and Architect/Engineer.
4. Communication procedures.
5. Procedures and processing of requests for interpretations, field decisions, field orders, submittals, substitutions, Applications for Payments, proposal request, Change Orders, and Contract closeout procedures.
6. Scheduling.
7. Critical Work sequencing.

D. Contractor: Record minutes and distribute copies to participants within two days after meeting to Architect/Engineer, Owner, and those affected by decisions made.

1.4 SITE MOBILIZATION MEETING

A. Architect/Engineer will schedule meeting at Project Site prior to Contractor occupancy. Contractor presides over meeting.

B. Attendance Required: Architect/Engineer, Owner, Contractor, Contractor's superintendent, and major Subcontractors.

C. Minimum Agenda:

1. Use of premises by Owner and Contractor.
2. Owner's requirements.
3. Construction facilities and controls.
4. Temporary utilities.
5. Survey and building layout.
6. Security and housekeeping procedures.
7. Schedules.
8. Procedures for testing.
9. Procedures for maintaining record documents.
10. Requirements for startup of equipment.
11. Inspection and acceptance of equipment put into service during construction period.

D. Contractor: Record minutes and distribute copies to participants within two days after meeting .

1.5 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, and Architect/Engineer as appropriate to agenda topics for each meeting.

D. Minimum Agenda:

1. Review minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems impeding planned progress.
5. Review of submittal schedule and status of submittals.
6. Review of off-Site fabrication and delivery schedules.
7. Maintenance of Progress Schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on Progress Schedule and coordination.
13. Other business relating to Work.

E. Contractor: Record minutes and distribute copies to participants within two days after meeting.

1.6 PREINSTALLATION MEETINGS

A. When required in individual Specification Sections, convene preinstallation meetings at Project Site before starting Work of specific Section.

B. Require attendance of parties directly affecting, or affected by, Work of specific Section.

C. Notify Architect/Engineer four days in advance of meeting date.

D. Prepare agenda and preside over meeting:

1. Review conditions of installation, preparation, and installation procedures.
2. Review coordination with related Work.

E. Record minutes and distribute to participants within two days after meeting.

1.7 CLOSEOUT MEETING

A. Schedule Project closeout meeting with sufficient time to prepare for requesting Substantial Completion. Preside over meeting and be responsible for minutes.

B. Attendance Required: Contractor, major Subcontractors, Architect/Engineer, Owner, and others appropriate to agenda.

C. Notify Architect/Engineer four days in advance of meeting date.

D. Minimum Agenda:

1. Start-up of facilities and systems.
2. Operations and maintenance manuals.
3. Testing, adjusting, and balancing.
4. System demonstration and observation.
5. Operation and maintenance instructions for Owner's personnel.
6. Contractor's inspection of Work.
7. Contractor's preparation of an initial "punch list."
8. Procedure to request Architect/Engineer inspection to determine date of Substantial Completion.
9. Completion time for correcting deficiencies.
10. Inspections by authorities having jurisdiction.
11. Certificate of Occupancy and transfer of insurance responsibilities.
12. Partial release of retainage.
13. Final cleaning.
14. Preparation for final inspection.
15. Closeout Submittals:

    a. Project record documents.
    b. Operating and maintenance documents.
    c. Operating and maintenance materials.
    d. Affidavits.

16. Final Application for Payment.
17. Contractor's demobilization of Site.
18. Maintenance.

E. Record minutes and distribute to participants within two days after meeting.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 ALTERATION PROCEDURES

A. Entire facility will be occupied for normal operations during progress of construction. Cooperate with Owner in scheduling operations to minimize conflict and to permit continuous usage.

1. Perform Work not to interfere with operations of occupied areas.
2. Keep utility and service outages to a minimum and perform only after written approval of Owner.
3. Clean Owner-occupied areas daily. Clean spillage, overspray, and heavy collection of dust in Owner-occupied areas immediately.

B. Materials: As specified in product Sections; match existing products with new products for patching and extending Work.

C. Employ skilled and experienced installer to perform alteration and renovation Work.

D. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion. Comply with Section 017000 - Execution and Closeout Requirements

E. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

F. Remove debris and abandoned items from area and from concealed spaces.

G. Prepare surface and remove surface finishes to permit installation of new Work and finishes.

H. Close openings in exterior surfaces to protect existing Work from weather and extremes of temperature and humidity.

I. Remove, cut, and patch Work to minimize damage and to permit restoring products and finishes to original or specified condition.

J. Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with neat transition to adjacent finishes.

K. Where new Work abuts or aligns with existing Work, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

L. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect/Engineer for review.

M. Where change of plane of 1/4 inch or more occurs, request instructions from Architect/Engineer.

N. Trim existing doors to clear new floor finish. Refinish trim to original or specified condition.

O. Patch or replace portions of existing surfaces that are damaged, lifted, discolored, or showing other imperfections.

P. Finish surfaces as specified in individual product Sections.

END OF SECTION 013000

SECTION 013216 - CONSTRUCTION PROGRESS SCHEDULE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. Format for construction schedules.

D. Construction schedules.

E. Bar chart schedules.

F. Review and evaluation.

G. Updating schedules.

H. Distribution.

1.2 SUBMITTALS

A. Within 10 days after date established in Notice to Proceed, submit proposed preliminary construction schedule defining planned operations for first 60 days of Work, with general outline for remainder of Work.

B. Submit construction schedules with each Application for Payment.

C. Submit construction schedules under transmittal letter form specified in Section 013300 - Submittal Procedures.

D. Schedule Updates:

1. Overall percent complete, projected and actual.
2. Completion progress by listed activity and subactivity, to within five working days prior to submittal.
3. Changes in Work scope and activities modified since submittal.
4. Delays in submittals or resubmittals, deliveries, or Work.
5. Adjusted or modified sequences of Work.
6. Other identifiable changes.
7. Revised projections of progress and completion.

E. Narrative Progress Report:

1. Submit with each monthly submission of Progress Schedule.
2. Summary of Work completed during the past period between reports.
3. Work planned during the next period.
4. Explanation of differences between summary of Work completed and Work planned in previously submitted report.

5. Current and anticipated delaying factors and estimated impact on other activities and completion milestones.
6. Corrective action taken or proposed.

1.3 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel with two years' minimum experience in scheduling construction work of complexity comparable to the Project.

1.4 FORMAT CONSTRUCTION SCHEDULE

A. Listings: Reading from left to right, in ascending order for each activity. Identify each activity with applicable Specification Section number.

B. Scale and Spacing: To allow for notations and revisions.

1.5 CONSTRUCTION SCHEDULES

A. Prepare construction schedule using critical path method.

B. Illustrate order and interdependence of activities and sequence of Work; how start of given activity depends on completion of preceding activities, and how completion of activity may restrain start of subsequent activities.

C. Illustrate complete sequence of construction by activity, identifying Work of separate stages. Indicate dates for submittals and return of submittals; dates for procurement and delivery of critical products; and dates for installation and provision for testing. Include legend for symbols and abbreviations used.

D. Mathematical Analysis: Tabulate each activity using calendar dates, and identify for each activity:

1. Preceding and following event numbers.
2. Activity description.
3. Estimated duration of activity
4. Status of critical activities.
5. Earliest start date.
6. Earliest finish date.
7. Actual start date.
8. Actual finish date.
9. Latest start date.
10. Latest finish date.
11. Total and free float; accrue float time to Owner and to Owner's benefit.
12. Monetary value of activity, keyed to Schedule of Values.
13. Percentage of activity completed.
14. Responsibility.

E. Required Sorts: List activities in sorts or groups:

1. By preceding Work item or event number from lowest to highest.
2. By longest float, then in order of early start.
3. By responsibility in order of earliest possible start date.
4. In order of latest allowable start dates.
5. In order of latest allowable finish dates.

6. Contractor's periodic payment request sorted by Schedule of Values list.
7. List of basic input data-generating report.
8. List of activities on critical path.

F. Prepare subschedules for each stage of Work identified in Section 011000 - Summary.

G. Coordinate contents with Schedule of Values in Section 013300 - Submittal Procedures.

1.6 BAR CHART SCHEDULES

A. Format: Bar chart Schedule, to include at least:

1. Identification and listing in chronological order of those activities reasonably required to complete the Work, including:

    a. Subcontract Work.
    b. Major equipment design, fabrication, factory testing, and delivery dates including required lead times.
    c. Move-in and other preliminary activities.
    d. Equipment and equipment system test and startup activities.
    e. Project closeout and cleanup.
    f. Work sequences, constraints, and milestones.

2. Listings identified by Specification Section number.
3. Identification of the following:

    a. Horizontal time frame by year, month, and week.
    b. Duration, early start, and completion for each activity and subactivity.
    c. Critical activities and Project float.
    d. Subschedules to further define critical portions of Work.

1.7 REVIEW AND EVALUATION

A. Participate in joint review and evaluation of schedules with Architect/Engineer at each submittal.

B. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.

C. After review, revise schedules incorporating results of review, and resubmit within 10 days.

1.8 UPDATING SCHEDULES

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Update schedules to depict current status of Work.

C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

D. Upon approval of a Change Order, include the change in the next schedule submittal.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit sorts as required to support recommended changes.

G. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect including effects of changes on schedules of separate Contractors.

1.9 DISTRIBUTION

A. Following joint review, distribute copies of updated schedules to Contractor's Project site file, to Subcontractors, suppliers, Architect/Engineer, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 013216

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Definitions.

B. Submittal procedures.

C. Construction progress schedules.

D. Proposed product list.

E. Product data.

F. Use of electronic CAD files of Project Drawings.

G. Shop Drawings.

H. Samples.

I. Other submittals.

J. Design data.

K. Test reports.

L. Certificates.

M. Manufacturer's instructions.

N. Manufacturer's field reports.

O. Erection Drawings.

P. Construction photographs.

Q. Contractor review.

R. Architect/Engineer review.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect/Engineer's responsive action.

B. Informational Submittals: Written and graphic information and physical Samples that do not require Architect/Engineer's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. Transmit each submittal with AIA G810 - Transmittal Letter.

B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.

C. Identify: Project, Contractor, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.

D. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.

E. Schedule submittals to expedite Project, and deliver to Architect/Engineer at business address or submit electronic submittals via email as PDF electronic files. Coordinate submission of related items.

F. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.

G. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.

H. Allow space on submittals for Contractor and Architect/Engineer review stamps.

I. When revised for resubmission, identify changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.

K. Submittals not requested will not be recognized nor processed.

L. Incomplete Submittals: Architect/Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Architect/Engineer.

1.4 CONSTRUCTION PROGRESS SCHEDULES

A. Comply with Section 013216 - Construction Progress Schedule

1.5 PROPOSED PRODUCT LIST

A. Within 15 days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.6 PRODUCT DATA

A. Product Data: Action Submittal: Submit to Architect/Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.

B. Submit number of copies Contractor requires, plus two copies Architect/Engineer will retain.

C. Submit electronic submittals via email as PDF electronic files.

D. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

E. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

F. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.7 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.

B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:

1. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver i
3. s responsible for determining and complying with these conditions and for incorporating addenda and modifications.
4. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
5. Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
6. Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
7. Receiver shall not hold Architect/Engineer responsible for such viruses or their consequences, and shall hold Architect/Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

1.8 SHOP DRAWINGS

A. Shop Drawings: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.

B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.

1. Include signed and sealed calculations to support design.
2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
3. Make revisions and provide additional information when required by authorities having jurisdiction.

D. Submit electronic submittals via email as PDF electronic files.

E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.9 SAMPLES

A. Samples: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.

B. Samples for Selection as Specified in Product Sections:

1. Submit to Architect/Engineer for aesthetic, color, and finish selection.
2. Submit Samples of finishes, textures, and patterns for Architect/Engineer selection.

C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.

D. Include identification on each Sample, with full Project information.

E. Submit number of Samples specified in individual Specification Sections; Architect/Engineer will retain one Sample.

F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.

G. Samples will not be used for testing purposes unless specifically stated in Specification Section.

H. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 017000 - Execution and Closeout Requirements.

1.10 OTHER SUBMITTALS

A. Closeout Submittals: Comply with Section 017000 - Execution and Closeout Requirements.

B. Informational Submittal: Submit data for Architect/Engineer's knowledge as Contract administrator or for Owner.

C. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

1.11 TEST REPORTS

A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.

B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.12 CERTIFICATES

A. Informational Submittal: Submit certification by manufacturer, installation/application Subcontractor, or Contractor to Architect/Engineer, in quantities specified for Product Data.

B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product but must be acceptable to Architect/Engineer.

1.13 MANUFACTURER'S INSTRUCTIONS

A. Informational Submittal: Submit manufacturer's installation instructions for Architect/Engineer's knowledge as Contract administrator or for Owner.

B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Architect/Engineer in quantities specified for Product Data.

C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.14 MANUFACTURER'S FIELD REPORTS

A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.

B. Submit report within 5 days of observation to Architect/Engineer for information.

C. Submit reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.15 ERECTION DRAWINGS

A. Informational Submittal: Submit Drawings for Architect/Engineer's knowledge as Contract administrator or for Owner.

B. Submit Drawings for information assessing conformance with information given and design concept expressed in Contract Documents.

C. Data indicating inappropriate or unacceptable Work may be subject to action by Architect/Engineer or Owner.

1.16 CONSTRUCTION PHOTOGRAPHS

A. Take photographs of Site and construction throughout progress of Work.

B. Take photographs as evidence of existing Project conditions.

C. Each photo shall have a date stamp.

D. Digital Images: Deliver complete set of digital image electronic files on CD-ROM to Owner with Project record documents. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as sensor, uncropped.

1. Digital Images: Uncompressed TIFF format, produced by digital camera with minimum sensor size of 4.0 megapixels, and image resolution of not less than 1024 by 768 pixels.
2. Date and Time: Include date and time in filename for each image.

1.17 CONTRACTOR REVIEW

A. Review for compliance with Contract Documents and approve submittals before transmitting to Architect/Engineer.

B. Contractor: Responsible for:

1. Determination and verification of materials including manufacturer's catalog numbers.
2. Determination and verification of field measurements and field construction criteria.
3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
4. Determination of accuracy and completeness of dimensions and quantities.
5. Confirmation and coordination of dimensions and field conditions at Site.
6. Construction means, techniques, sequences, and procedures.
7. Safety precautions.
8. Coordination and performance of Work of all trades.

C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.

D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Architect/Engineer.

1.18 ARCHITECT/ENGINEER REVIEW

A. Do not make "mass submittals" to Architect/Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 15 or more submittals or items in one week. If "mass submittals" are received, Architect/Engineer's review time stated above will be extended as necessary to perform proper review. Architect/Engineer will review "mass submittals" based on priority determined by Architect/Engineer after consultation with Owner and Contractor.

B. Informational submittals and other similar data are for Architect/Engineer's information, do not require Architect/Engineer's responsive action, and will not be reviewed or returned with comment.

C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.

D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Quality control.

B. Tolerances.

C. References.

D. Labeling.

E. Mockup requirements.

F. Testing and inspection services.

G. Manufacturers' field services.

1.2 QUALITY CONTROL

A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.

B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

C. Perform Work using persons qualified to produce required and specified quality.

D. Products, materials, and equipment may be subject to inspection by Architect/Engineer at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.

E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.3 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current as of date of Contract Documents except where specific date is established by code.

C. Obtain copies of standards and maintain on Site when required by product Specification Sections.

D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference in reference documents.

1.5 LABELING

A. Attach label from agency approved by authorities having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.

B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:

1. Model number.
2. Serial number.
3. Performance characteristics.

C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.6 MOCK-UP REQUIREMENTS

A. Tests will be performed under provisions identified in this Section and identified in individual product Specification Sections.

B. Assemble and erect specified or indicated items with specified or indicated attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mockups shall be comparison standard for remaining Work.

D. Where mockup has been accepted by Architect/Engineer and is specified in product Specification Sections to be removed, remove mockup and clear area when directed to do so by Architect/Engineer.

1.7 TESTING AND INSPECTION SERVICES

A. Owner will employ and pay for services of an independent firm to perform testing and inspection not specifically called out in the specifications.

B. Contractor shall employ and pay for services of an independent testing agency or laboratory acceptable to Owner to perform specified testing.

1. Before starting Work, submit testing laboratory name, address, and telephone number, and names of full-time Professional Engineer and responsible officer.
2. Submit copy of report of laboratory facilities' inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.

C. Independent firm will perform tests, inspections, and other services specified in individual Specification Sections and as required by Architect/Engineer.

1. Laboratory: Authorized to operate at Project location.
2. Laboratory Staff: Maintain full-time specialist on staff to review services.
3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.

D. Testing, inspections, and source quality control may occur on or off Project Site. Perform off-Site testing as required by Architect/Engineer or Owner.

E. Reports shall be submitted by independent firm to Architect/Engineer, Contractor, and authorities having jurisdiction, indicating observations and results of tests and compliance or noncompliance with Contract Documents.

1. Submit final report indicating correction of Work previously reported as noncompliant.

F. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

1. Notify Architect/Engineer and independent firm 24 hours before expected time for operations requiring services.
2. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.

G. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.

H. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Architect/Engineer. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.

I. Agency Responsibilities:

1. Test Samples of mixes submitted by Contractor.
2. Provide qualified personnel at Site. Cooperate with Architect/Engineer and Contractor in performance of services.
3. Perform indicated sampling and testing of products according to specified standards.
4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect/Engineer and Contractor of observed irregularities or nonconformance of Work or products.
6. Perform additional tests required by Architect/Engineer.
7. Attend preconstruction meetings and progress meetings.

J. Agency Reports: After each test, promptly submit two copies of report to Architect/Engineer, Contractor, and authorities having jurisdiction. When requested by Architect/Engineer, provide interpretation of test results. Include the following:

1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and Specification Section.
6. Location in Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

K. Limits on Testing Authority:

1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency or laboratory may not approve or accept any portion of the Work.
3. Agency or laboratory may not assume duties of Contractor.
4. Agency or laboratory has no authority to stop the Work.

1.8 MANUFACTURER'S FIELD SERVICES

A. When specified in individual Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, testing, adjusting, and balancing of equipment and as applicable, and to initiate instructions when necessary.

B. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations.

C. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

D. Refer to Section 013300 - Submittal Procedures, "Manufacturer's Field Reports" Article.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities:

1. Temporary electricity.
2. Temporary lighting for construction purposes.
3. Temporary heating.
4. Temporary cooling.
5. Temporary ventilation.
6. Communication services.
7. Temporary water service.
8. Temporary sanitary facilities.

B. Construction Facilities:

1. Field offices and sheds.
2. Vehicular access.
3. Parking.
4. Progress cleaning and waste removal.
5. Project identification.
6. Traffic regulation.
7. Fire-prevention facilities.

C. Temporary Controls:

1. Barriers.
2. Enclosures and fencing.
3. Security.
4. Water control.
5. Dust control.
6. Erosion and sediment control.
7. Noise control.
8. Pest and rodent control.
9. Pollution control.

D. Removal of utilities, facilities, and controls.

1.2 REFERENCES

A. ASTM International:

1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
3. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.3 TEMPORARY ELECTRICITY

A. Provide and pay for power service required from utility source as needed for construction operation.

B. Provide power outlets with branch wiring and distribution boxes located as required for construction operations. Provide suitable, flexible power cords as required for portable construction tools and equipment.

C. Provide main service disconnect and overcurrent protection at convenient location.

D. Provide distribution equipment, wiring, and outlets for single-phase branch circuits for power and lighting.

1. Provide 20-ampere duplex outlets, single-phase circuits for power tools.
2. Provide 20-ampere, single-phase branch circuits for lighting.

1.4 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain lighting for construction operations to achieve minimum lighting level of 2 watts/sq ft.

B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.

C. Provide and maintain 0.25 watt/sq ft lighting to interior work areas after dark for security purposes.

D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, lamps, and the like, for specified lighting levels.

E. Maintain lighting and provide routine repairs.

F. Permanent building lighting may be used during construction.

1.5 TEMPORARY HEATING

A. Provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations.

B. Enclose building before activating temporary heat according to "Enclosures and Fencing" Article in this Section.

C. Before operating permanent equipment for temporary heating purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and wo

D. rn or consumed parts. Replace filters at Substantial Completion.

E. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress unless indicated otherwise in individual product Sections.

1.6 TEMPORARY COOLING

A. Provide and pay for cooling devices and cooling as needed to maintain specified conditions for construction operations.

B. Enclose building before activating temporary cooling according to ""Enclosures and Fencing"" Article in this Section.

C. Before operating permanent equipment for temporary cooling purposes, verify installation is approved for operation, equipment is lubricated, and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and wo

D. rn or consumed parts. Replace filters at Substantial Completion.

E. Maintain maximum ambient temperature of 80 degrees F in areas where construction is in progress unless indicated otherwise in individual product Sections.

1.7 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

1.8 COMMUNICATION SERVICES

A. Telephone Service: Provide, maintain, and pay for telephone service to field office at time of Project mobilization and until completion of Work.

B. Facsimile Service: Provide, maintain, and pay for facsimile service to field office at time of Project mobilization and until completion of Work.

C. Internet Service: Provide, maintain, and pay for broadband Internet service to field office at time of Project mobilization. Provide desktop computer with Microsoft operating system and appropriate office function software, modem, and printer.

1.9 TEMPORARY WATER SERVICE

A. Provide and pay for suitable quality water service as needed to maintain specified conditions for construction operations.

B. Extend branch piping with outlets located so that water is available by hoses with threaded connections.

1.10 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of Project mobilization.

1.11 FIELD OFFICES AND SHEDS

A. Designated existing spaces may be used for field offices and for storage:

B. Locate field offices and sheds a minimum distance of 30 feet from existing and new structures.

C. When permanent facilities are enclosed with operable utilities, relocate field offices and storage into building, with written agreement of Owner, and remove temporary buildings.

D. Storage Areas and Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and inspection of products to suit requirements in Section 016000 - Product Requirements.

E. Preparation: Fill and grade Sites for temporary structures sloped for drainage away from buildings.

F. Installation:

1. Install field office spaces ready for occupancy 15 days after date established by Notice to Proceed.
2. Employee Residential Occupancy: Not allowed on Owner's property.

G. Maintenance and Cleaning:

1. Weekly janitorial services for field offices; periodic cleaning and maintenance for sheds and storage areas.
2. Maintain walks free of mud, water, snow, and the like.

H. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas to same or better condition as original condition.

1.12 VEHICULAR ACCESS

A. Construct temporary access roads from public thoroughfares to serve construction area, of width and load-bearing capacity to accommodate unimpeded traffic for construction purposes.

B. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.

C. Extend and relocate vehicular access as Work progress requires and provide detours as necessary for unimpeded traffic flow.

D. Locate as approved by Architect/Engineer.

E. Provide unimpeded access for emergency vehicles. Maintain 20 foot-wide driveways with turning space between and around combustible materials.

F. Provide and maintain access to fire hydrants and control valves free of obstructions.

G. Provide means of removing mud from vehicle wheels before entering streets.

1.13 PARKING

A. Provide temporary gravel surface parking areas to accommodate construction personnel.

B. Locate as approved by Architect/Engineer.

C. If Site space is not adequate, provide additional off-Site parking.

D. Do not allow heavy vehicles or construction equipment in parking areas.

E. Permanent Pavements and Parking Facilities:

1. Before Substantial Completion, bases for permanent roads and parking areas may be used for construction traffic.
2. Avoid traffic loading beyond paving design capacity. Tracked vehicles are not allowed.
3. Use of permanent parking structures is permitted.

F. Maintenance:

1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, ice, and the like.
2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original condition.

G. Removal, Repair:

1. Remove temporary materials and construction before Substantial Completion.
2. Repair existing facilities damaged by use, to original condition.

H. Mud from Site vehicles: Provide means of removing mud from vehicle wheels before entering streets.

1.14 PROGRESS CLEANING AND WASTE REMOVAL

A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, before enclosing spaces.

C. Broom and vacuum clean interior areas before starting surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from Site periodically and dispose of off-Site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.15 PROJECT IDENTIFICATION (Not Used)

1.16 TRAFFIC REGULATION (Not Used)

1.17 FIRE-PREVENTION FACILITIES

A. Prohibit smoking within buildings under construction and demolition. Designate area on Site where smoking is permitted. Provide approved ashtrays in designated smoking areas.

B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.

C. Portable Fire Extinguishers: NFPA 10; 10-pound capacity, 4A-60B: C UL rating.

1. Provide one fire extinguisher at each stairway on each floor of buildings under construction and demolition.
2. Provide minimum of one fire extinguisher in every construction trailer and storage shed.
3. Provide minimum of one fire extinguisher on roof during roofing operations using heat-producing equipment.

1.18 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to allow for Owner's use of Site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Tree and Plant Protection: Preserve and protect existing trees and plants designated to remain.

1. Protect areas within drip lines from traffic, parking, storage, dumping, chemically injurious materials and liquids, ponding, and continuous running water.
2. Provide 6-foot-high barriers around drip line, with access for maintenance.
3. Replace trees and plants damaged by construction operations.

C. Protect non-owned vehicular traffic, stored materials, Site, and structures from damage.

1.19 ENCLOSURES AND FENCING (Not Used)

1.20 SECURITY (Not Used)

1.21 WATER CONTROL

A. Grade Site to drain. Maintain excavations free of water. Provide, operate, and maintain necessary pumping equipment.

B. Protect Site from puddles or running water. Provide water barriers as required to protect Site from soil erosion.

1.22 DUST CONTROL

A. Execute Work by methods that minimize raising dust from construction operations.

B. Provide positive means to prevent airborne dust from dispersing into atmosphere and into Owner-occupied areas.

1.23 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize surface area of bare soil exposed at one time.

C. Provide temporary measures including berms, dikes, drains, and other devices to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts and clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation. Promptly apply corrective measures.

1.24 NOISE CONTROL

A. Provide methods, means, and facilities to minimize noise produced by construction operations.

1.25 PEST AND RODENT CONTROL

A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work and entering facility.

B. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

1.26 POLLUTION CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.

B. Comply with pollution and environmental control requirements of authorities having jurisdiction.

1.27 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials before Substantial Completion inspection.

B. Clean and repair damage caused by installation or use of temporary Work.

C. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION - Not Used

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Products.

B. Product delivery requirements.

C. Product storage and handling requirements.

D. Product options.

E. Equipment electrical characteristics and components.

1.2 PRODUCTS

A. At minimum, comply with specified requirements and reference standards.

B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.

C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.

D. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.

E. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

A. Comply with delivery requirements in Section 017419 - Construction Waste Management and Disposal.

B. Transport and handle products according to manufacturer's instructions.

C. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

D. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store and protect products according to manufacturer's instructions.

B. Store products with seals and labels intact and legible.

C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.

D. For exterior storage of fabricated products, place products on sloped supports aboveground.

E. Provide bonded off-Site storage and protection when Site does not permit on-Site storage or protection.

F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.

H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.

I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to Section 012500 - Substitution Procedures.

PART 2 - PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Include lugs for terminal box.

B. Cord and Plug: Furnish minimum 6-foot (2-m) long cord and plug including grounding connector for connection to electric wiring system. Cord of longer length may be specified in individual Specification Sections.

PART 3 - EXECUTION - Not Used

END OF SECTION 016000

SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Field engineering.

B. Closeout procedures.

C. Starting of systems.

D. Demonstration and instructions.

E. Testing, adjusting, and balancing.

F. Project record documents.

G. Operation and maintenance data.

H. Manual for materials and finishes.

I. Manual for equipment and systems.

J. Spare parts and maintenance products.

K. Product warranties and product bonds.

L. Maintenance service.

M. Examination.

N. Preparation.

O. Execution.

P. Cutting and patching.

Q. Protecting installed construction.

R. Final cleaning.

1.2 FIELD ENGINEERING

A. Employ land surveyor registered at Project location.

B. Locate and protect survey control and reference points. Promptly notify Architect/Engineer of discrepancies discovered.

C. Prior to beginning Work, verify and establish floor elevations of existing facilities to ensure that new Work will meet existing elevations in smooth and level alignment except where specifically detailed or indicated otherwise.

D. Verify setbacks and easements; confirm Drawing dimensions and elevations.

E. Provide field engineering services. Establish elevations, lines, and levels using recognized engineering survey practices.

F. Submit copy of Site drawing and certificate signed by land surveyor certifying elevations and locations of the Work are in conformance with Contract Documents.

G. Maintain complete and accurate log of control and survey Work as Work progresses.

H. On completion of foundation walls and major Site improvements, prepare certified survey illustrating dimensions, locations, angles, and elevations of construction and Site Work.

I. Protect survey control points prior to starting Site Work; preserve permanent reference points during construction.

J. Promptly report to Architect/Engineer loss or destruction of reference point or relocation required because of changes in grades or other reasons.

K. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect/Engineer.

L. Final Property Survey: Prior to Substantial Completion, prepare final property survey illustrating locations, dimensions, angles, and elevations of buildings and Site Work that have resulted from construction indicating their relationship to permanent bench marks and property lines.

1. Show significant features (real property) for Project.
2. Include certification on survey, signed by surveyor, that principal metes, bounds, lines, levels, and elevations of Project are accurately shown.

1.3 CLOSEOUT PROCEDURES

A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:

1. Submit maintenance manuals, Project record documents, digital images of construction photographs, and other similar final record data in compliance with this Section.
2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified in compliance with this Section.
3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.
4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
5. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.

6. Make final change-over of locks and transmit keys directly to Owner. Advise Owner's personnel of change-over in security provisions.
7. Discontinue or change over and remove temporary facilities and services from Project Site, along with construction tools, mockups, and similar elements.
8. Perform final cleaning according to this Section.

B. Substantial Completion Inspection:

1. When Contractor considers Work to be substantially complete, submit to Architect/Engineer:

   a. Written certificate that Work, or designated portion, is substantially complete.
   b. List of items to be completed or corrected (initial punch list).

2. Within seven days after receipt of request for Substantial Completion, Architect/Engineer will make inspection to determine whether Work or designated portion is substantially complete.
3. Should Architect/Engineer determine that Work is not substantially complete:

   a. Architect/Engineer will promptly notify Contractor in writing, stating reasons for its opinion.
   b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Architect/Engineer.
   c. Architect/Engineer will reinspect Work.
   d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect/Engineer's inspection.

4. When Architect/Engineer finds that Work is substantially complete, Architect/Engineer will:

   a. Prepare Certificate of Substantial Completion on AIA G704 - Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Architect/Engineer and Owner (final punch list).
   b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.

5. After Work is substantially complete, Contractor shall:

   a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
   b. Complete Work listed for completion or correction within time period stipulated.

6. Owner will occupy all of building as specified in Section 011000 - Summary.

C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.

1. When Contractor considers Work to be complete, submit written certification that:

   a. Contract Documents have been reviewed.
   b. Work has been examined for compliance with Contract Documents.
   c. Work has been completed according to Contract Documents.
   d. Work is completed and ready for final inspection.

2. Submittals: Submit following:

   a. Final punch list indicating all items have been completed or corrected.

b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
d. Accounting statement for final changes to Contract Sum.
e. Contractor's affidavit of payment of debts and claims on AIA G706 - Contractor's Affidavit of Payment of Debts and Claims.
f. Contractor affidavit of release of liens on AIA G706A - Contractor's Affidavit of Release of Liens.
g. Consent of surety to final payment on AIA G707 - Consent of Surety to Final Payment Form.

3. Perform final cleaning for Contractor-soiled areas according to this Section.

D. Final Completion Inspection:

1. Within seven days after receipt of request for final inspection, Architect/Engineer will make inspection to determine whether Work or designated portion is complete.
2. Should Architect/Engineer consider Work to be incomplete or defective:

a. Architect/Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.
b. Contractor shall remedy stated deficiencies and send second written request to Architect/Engineer that Work is complete.
c. Architect/Engineer will reinspect Work.
d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect/Engineer's inspection.

1.4 STARTING OF SYSTEMS

A. Coordinate schedule for startup of various equipment and systems.

B. Notify Architect/Engineer seven days prior to startup of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.

E. Verify that wiring and support components for equipment are complete and tested.

F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.

G. When specified in individual Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.

H. Submit a written report according to Section 013300 - Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. Demonstrate Project equipment and instructed by qualified manufacturer's representative who is knowledgeable about the Project.

C. Video Recordings: Provide high-quality color video recordings of demonstration and instructional sessions. Engage commercial videographer to record sessions. Include classroom instructions, demonstrations, board diagrams, and other visual aids. Include menu navigation.

D. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

E. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.

F. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed time, at equipment location.

G. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

H. Required instruction time for each item of equipment and system is specified in individual Specification Sections.

1.6 TESTING, ADJUSTING, AND BALANCING

A. Owner will appoint, employ, and pay for services of independent firm to perform testing, adjusting, and balancing except as noted in specific sections.

B. Independent firm will perform services specified in Section 230593 - Testing, Adjusting, and Balancing for HVAC.

C. Reports will be submitted by independent firm to Architect/Engineer indicating observations and results of tests and indicating compliance or noncompliance with requirements of Contract Documents.

1.7 PROJECT RECORD DOCUMENTS

A. Maintain on Site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed Shop Drawings, product data, and Samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:

1. Manufacturer's name and product model and number.
2. Product substitutions or alternates used.
3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:

1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
2. Include locations of concealed elements of the Work.
3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
5. Identify and locate existing buried or concealed items encountered during Project.
6. Measured depths of foundations in relation to finish [first] [main] floor datum.
7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
9. Field changes of dimension and detail.
10. Details not on original Drawings.

G. Submit marked-up paper copy documents to Architect/Engineer with claim for final Application for Payment.

H. Submit PDF electronic files of marked-up documents to Architect/Engineer with claim for final Application for Payment.

1.8 OPERATION AND MAINTENANCE DATA

A. Submit in PDF composite electronic indexed file.

B. Submit data bound in 8-1/2 x 11-inch (A4) text pages, three D side ring binders with durable plastic covers.

C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.

D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:

1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.

2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:

    a. Significant design criteria.
    b. List of equipment.
    c. Parts list for each component.
    d. Operating instructions.
    e. Maintenance instructions for equipment and systems.
    f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
    g. Safety precautions to be taken when operating and maintaining or working near equipment.

3. Part 3: Project documents and certificates, including the following:

    a. Shop Drawings and product data.
    b. Air and water balance reports.
    c. Certificates.
    d. Originals of warranties and bonds.

1.9 MANUAL FOR MATERIALS AND FINISHES

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.

B. For equipment or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes before Substantial Completion.

D. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.

E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations.

F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

G. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.

H. Additional Requirements: As specified in individual product Specification Sections.

I. Include listing in table of contents for design data, with tabbed fly sheet and space for insertion of data.

1.10 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes before Substantial Completion.

D. Submit in PDF composite electronic indexed file of final manual within ten days after final inspection.

E. Each Item of Equipment and Each System: Include description of unit or system and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

F. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

G. Include color-coded wiring diagrams as installed.

H. Operating Procedures: Include startup, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and special operating instructions.

I. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

J. Include servicing and lubrication schedule and list of lubricants required.

K. Include manufacturer's printed operation and maintenance instructions.

L. Include sequence of operation by controls manufacturer.

M. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

N. Include control diagrams by controls manufacturer as installed.

O. Include Contractor's coordination drawings with color-coded piping diagrams as installed.

P. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

Q. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

R. Include test and balancing reports as specified in Section 014000 - Quality Requirements.

S. Additional Requirements: As specified in individual product Specification Sections.

T. Include listing in table of contents for design data with tabbed dividers and space for insertion of data.

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Specification Sections.

B. Deliver to Project Site and place in location as directed by Owner; obtain receipt prior to final payment.

1.12 PRODUCT WARRANTIES AND PRODUCT BONDS

A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.

B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include table of contents and assemble in three D side ring binder with durable plastic cover.

F. Submit prior to final Application for Payment.

G. Time of Submittals:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
2. Make other submittals within ten days after date of Substantial Completion, prior to final Application for Payment.
3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.13 MAINTENANCE SERVICE

A. Furnish service and maintenance of components indicated in Specification Sections during warranty period.

B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.

D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual Specification Sections.

D. Verify that utility services are available with correct characteristics and in correct locations.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

3.3 EXECUTION

A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.

B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.

D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Architect/Engineer for final decision.

E. Allow for expansion of materials and building movement.

F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.

1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.

G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.

1. Refer questionable mounting heights choices to Architect/Engineer for final decision.
2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.

H. Adjust operating products and equipment to ensure smooth and unhindered operation.

I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.4 CUTTING AND PATCHING

A. Employ skilled and experienced installers to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements affecting:

1. Structural integrity of element.
2. Integrity of weather-exposed or moisture-resistant elements.
3. Efficiency, maintenance, or safety of element.
4. Visual qualities of sight-exposed elements.
5. Work of Owner or separate contractor.

C. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:

1. Fit the several parts together, to integrate with other Work.
2. Uncover Work to install or correct ill-timed Work.
3. Remove and replace defective and nonconforming Work.
4. Remove samples of installed Work for testing.
5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.

E. Cut masonry and concrete materials using masonry saw or core drill.

F. Restore Work with new products according to requirements of Contract Documents.

G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.

H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

I. At penetrations of fire-rated walls, partitions, ceiling, or floor construction, completely seal voids with fire-rated material according to Section 078400 - Firestopping, to full thickness of penetrated element.

J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.

K. Identify hazardous substances or conditions exposed during the Work to Architect/Engineer for decision or remedy.

3.5 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual Specification Sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

3.6 FINAL CLEANING

A. Execute final cleaning prior to final Project assessment.

1. Employ experienced personnel or professional cleaning firm.

B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces; and vacuum carpeted and soft surfaces.

C. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.

D. Replace filters of operating equipment.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Clean Site; sweep paved areas, rake clean landscaped surfaces.

G. Remove waste and surplus materials, rubbish, and construction facilities from Site.

END OF SECTION 017000

DIVISION 2
EXISTING CONDITIONS



SECTION 024119.13 - SELECTIVE BUILDING DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolishing designated building equipment and fixtures.
2. Demolishing designated construction.
3. Cutting and alterations for completion of the Work.
4. Removing designated items for reuse.
5. Protecting items designated to remain.
6. Removing demolished materials.

1.2 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Demolition Schedule: Indicate overall schedule and interruptions required for utility and building services.

1.3 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Accurately record actual locations of capped utilities, concealed utilities discovered during demolition, and subsurface obstructions.

C. Operation and Maintenance Data: Submit description of system, inspection data, and parts lists.

1.4 QUALITY ASSURANCE

A. Conform to applicable code for demolition work, dust control, and products requiring electrical disconnection and re-connection.

B. Conform to applicable code for procedures when hazardous or contaminated materials are discovered.

C. Obtain required permits from authorities having jurisdiction.

D. Perform Work in accordance with Municipality standard.

1.5 SCHEDULING

A. Section 013216 - Construction Progress Schedule: Requirements for scheduling.

B. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation and in adjoining spaces.

C. Coordinate utility and building service interruptions with Owner.

1. Do not disable or disrupt building fire or life safety systems without three days prior written notice to Owner.
2. Schedule tie-ins to existing systems to minimize disruption.
3. Coordinate Work to ensure fire sprinklers, fire alarms, smoke detectors, emergency lighting, exit signs and other life safety systems remain in full operation in occupied areas.

1.6 PROJECT CONDITIONS

A. Conduct demolition to minimize interference with adjacent and occupied building areas.

B. Cease operations immediately if structure appears to be in danger and notify Architect/Engineer. Do not resume operations until directed.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 PREPARATION

A. Notify affected utility companies before starting work and comply with their requirements.

B. Mark location and termination of utilities.

C. Erect, and maintain temporary barriers and security devices, including warning signs and lights, and similar measures, for protection of the Owner, and existing improvements indicated to remain.

D. Erect and maintain weatherproof closures for exterior openings.

E. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued Owner occupancy.

F. Prevent movement of structure; provide temporary bracing and shoring required to ensure safety of existing structure.

G. Provide appropriate temporary signage including signage for exit or building egress.

H. Do not close or obstruct building egress path.

I. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

3.2 SALVAGE REQUIREMENTS

A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner.

B. Tag components and equipment Owner designates for salvage.

C. Protect designated salvage items from demolition operations until items can be removed.

D. Carefully remove building components and equipment indicated to be salvaged.

E. Disassemble as required to permit removal from building.

F. Package small and loose parts to avoid loss.

G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.

H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.

I. Deliver salvaged items to Owner. Obtain signed receipt from Owner.

3.3 DEMOLITION

A. Conduct demolition to minimize interference with adjacent [and occupied] building areas.

B. Maintain protected egress from and access to adjacent existing buildings at all times.

C. Do not close or obstruct roadways without permits.

D. Cease operations immediately when structure appears to be in danger and notify Architect/Engineer.

E. Disconnect and remove designated utilities within demolition areas.

F. Cap and identify abandoned utilities at termination points when utility is not completely removed. Annotate Record Drawings indicating location and type of service for capped utilities remaining after demolition.

G. Demolish in orderly and careful manner. Protect existing improvements.

H. Carefully remove building components indicated to be reused.

1. Disassemble components as required to permit removal.
2. Package small and loose parts to avoid loss.
3. Mark components and packaged parts to permit reinstallation.
4. Store components, protected from construction operations, until reinstalled.

I. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

J. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.

K. Remove temporary Work.

END OF SECTION 024119.13

DIVISION 3
CONCRETE



SECTION 031000 - CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formwork for cast-in-place concrete.
2. Shoring, bracing, and anchorage.
3. Form accessories.
4. Form stripping.

B. Related Requirements:

1. Section 032000 - Concrete Reinforcing: Reinforcing steel and required supports for cast-in-place concrete.
2. Section 033000 - Cast-in-Place Concrete: Cast-in-place or in-situ concrete for slabs-on-grade and other concrete components associated with building.

1.2 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 117 - Specification for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 318 - Building Code Requirements for Structural Concrete.
4. ACI 347 - Guide to Formwork for Concrete.

B. American Forest & Paper Association:

1. AF&PA - National Design Specification (NDS) for Wood Construction.

C. American Society of Mechanical Engineers:

1. ASME A17.1 - Safety Code for Elevators and Escalators.

D. APA - The Engineered Wood Association:

1. APA/EWA PS 1 - Voluntary Product Standard - Structural Plywood.

E. ASTM International:

1. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
2. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with other Sections of Work in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

1.4 QUALITY ASSURANCE

A. Perform Work according to ACI 347.

B. For wood products furnished for Work of this Section, comply with AF&PA.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Store materials off ground in ventilated and protected manner to prevent deterioration from moisture.

PART 2 - PRODUCTS

2.1 WOOD FORM MATERIALS

A. Form Materials: At discretion of Contractor.

2.2 FORMWORK ACCESSORIES

A. Form Release Agent:

1. Description: Colorless mineral oil that will not stain concrete or absorb moisture.

B. Vapor Retarder:

1. Description: Polyethylene sheet.
2. Thickness: 10 mils.

C. Bituminous Joint Filler: Comply with ASTM D1751.

D. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength, and character to maintain formwork in place while placing concrete.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify lines, levels, and centers before proceeding with formwork.

C. Verify that dimensions agree with Drawings.

D. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Architect/Engineer before proceeding.

3.2 INSTALLATION

A. Earth Forms:

1. Trench earth forms neatly, accurately, and at least 2 inches wider than footing widths indicated on Drawings.
2. Trim sides and bottom of earth forms.
3. Construct wood edge strips at top of each side of trench to secure reinforcing and to prevent trench from sloughing.
4. Form sides of footings where earth sloughs.
5. Tamp earth forms firm and clear them of debris and loose material before depositing concrete.

B. Formwork:

1. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
2. Complete wedging and bracing before placing concrete.
3. Erect formwork, shoring, and bracing to achieve design requirements according to ACI 301.
4. Do not patch formwork.
5. Leave forms in place for minimum number of days according to ACI 347.

C. Form Removal:

1. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads, and removal has been approved by Architect/Engineer.
2. Loosen forms carefully; do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

D. Framing, Studding, and Bracing:

1. Maximum Spacing of Studs:
   a. Boards: Maximum 16 inches (400 mm) o.c.
   b. Plywood: 12 inches (300 mm) o.c.
2. Size framing, bracing, centering, and supporting members for sufficient strength to maintain shape and position under imposed loads from construction operations.
3. When placed on ground, protect against undermining, settlement, and accidental impact.

E. Inserts, Embedded Parts, and Openings:

1. Install formed openings for items to be embedded in or passing through concrete Work.
2. Locate and set in place items required to be cast directly into concrete.
3. Install accessories straight, level, and plumb, and ensure that items are not disturbed during concrete placement.

F. Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.

G. Construction Joints:

1. Install surfaced pouring strip where construction joints intersect on exposed surfaces to provide straight line at joints.
2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
3. Appearance:

    a. Show no overlapping of construction joints.
    b. Construct joints to present same appearance as butted plywood joints.

4. Arrange joints in continuous line straight, true, and sharp.

H. Embedded Items:

1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, waterstops, and other features.
2. Do not embed wood or uncoated aluminum in concrete.
3. Obtain installation and setting information for embedded items furnished under other Sections.
4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
5. Ensure that conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 regarding size and location limitations.

I. Openings for Items Passing through Concrete:
1. Establish exact locations, sizes, and other conditions required for openings and attachment of Work specified under other Sections.
2. Coordinate Work to avoid cutting and patching of concrete after placement.
3. Perform cutting and repairing of concrete required as result of failure to provide required openings.

J. Screeds:

1. Set screeds and establish levels for tops of and finish on concrete slabs.
2. Slope slabs to drain where required or as indicated on Drawings.
3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms; remove freestanding water.

K. Screed Supports:

1. For concrete over waterproof membranes and vapor retarder membranes, use cradle-, pad-, or base-type screed supports that will not puncture membrane.
2. Staking through membrane is not permitted.

3.3 TOLERANCES

A. Tolerances: Construct formwork to produce completed concrete surfaces within construction tolerances according to ACI 117.

END OF SECTION 031000

SECTION 032000 - CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Reinforcing bars.
2. Welded wire fabric.
3. Reinforcement accessories.

B. Related Requirements:

1. Section 031000 - Concrete Forming and Accessories: Form materials, waterstops, and accessories required to form cast-in-place concrete.
2. Section 033000 - Cast-in-Place Concrete: Cast-in-place concrete for slabs on grade and other concrete components associated with building.

1.2 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. ACI 530/530.1 - Building Code Requirements and Specification for Masonry Structures.
4. ACI SP-66 - ACI Detailing Manual.

B. American Welding Society:

1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

C. ASTM International:

1. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. ASTM A706 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
3. ASTM A767 - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.

D. Concrete Reinforcing Steel Institute:

1. CRSI 10-MSP - Manual of Standard Practice.
2. CRSI 10PLACE - Placing Reinforcing Bars.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with placement of formwork, formed openings, and other Work.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings:

1. Indicate bar sizes, spacings, locations, splice locations, and quantities of reinforcing steel and welded wire fabric.
2. Indicate bending and cutting schedules.
3. Indicate supporting and spacing devices.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Submit certified copies of mill test report of reinforcement materials analysis.

1.5 QUALITY ASSURANCE

A. Perform Work according to ACI 301.

B. Prepare Shop Drawings according to ACI SP-66.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

C. Store materials according to manufacturer instructions.

D. Protection:

1. Protect materials from moisture by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.7 EXISTING CONDITIONS

A. Field Measurements:

1. Verify field measurements prior to fabrication.
2. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 REINFORCEMENT

A. Deformed Reinforcement:

1. Material: Steel bars.

2. Comply with ASTM A706.
3. Yield Strength: 60 ksi.
4. Finish: Uncoated.

B. Welded Deformed Wire Fabric:

1. Comply with ASTM A1064.
2. Configuration: Flat sheets.
3. Finish: Uncoated.

2.2 FABRICATION

A. Fabricate concrete reinforcement according to CRSI 10-MSP.

B. Form standard hooks for 180-degree bends, 90-degree bends, stirrups, and tie hooks.

C. Form reinforcement bends with minimum diameters according to ACI 318.

D. Form ties and stirrups from following:

1. Bars No. 10 and Smaller: No. 3 deformed bars.
2. Bars No. 11 and Larger: No. 4 deformed bars.

E. Weld reinforcement according to AWS D1.4.

F. Splicing:

1. If not indicated on Drawings, locate reinforcement splices at point of minimum stress.

2.3 ACCESSORY MATERIALS

A. Tie Wire:

1. Minimum 16 gage, annealed type annealed type.

B. Chairs, Bolsters, Bar Supports, and Spacers:

1. Size and Shape: To strengthen and support reinforcement during concrete placement conditions.
2. Furnish load-bearing pad on bottom to prevent vapor retarder puncture.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Place, support, and secure reinforcement against displacement.

B. Do not deviate from required position beyond specified tolerance.

C. Do not weld crossing reinforcement bars for assembly.

D. Do not displace or damage vapor retarder.

E. Accommodate placement of formed openings.

F. Spacing:

1. Space reinforcement bars with minimum clear spacing according to ACI 318, equal to one bar diameter but not less than 1 inch.
2. If bars are indicated in multiple layers, place upper bars directly above lower bars.

G. Maintain minimum concrete cover around reinforcement according to ACI 318 as follows:

1. Footings and Concrete Formed against Earth: 3 inches.
2. Concrete Exposed to Earth or Weather:

a. No. 6 Bars and Larger: 2 inches.
b. No. 5 Bars and Smaller: 1-1/2 inches.

3.2 TOLERANCES

A. Section 014000 - Quality Requirements: Requirements for tolerances.

B. Install reinforcement within following tolerances for flexural members, walls, and compression members:

1. Reinforcement Depth Greater Than 8 Inches:

a. Depth Tolerance: Plus or Minus 3/8 inch.
b. Concrete Cover Tolerance:Minus 3/8 inch.

2. Reinforcement Depth Less Than or Equal to 8 Inches:

a. Depth Tolerance: Plus or Minus 1/2 inch.
b. Concrete Cover Tolerance:Minus 1/2 inch.

C. Foundation Walls: Install reinforcement within tolerances according to ACI 530/530.1.

3.3 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

B. Perform field inspection and testing according to ACI 318.

C. Reinforcement Inspection:

1. Placement Acceptance: Inspect specified and ACI 318 material requirements and specified placement tolerances.
2. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.

END OF SECTION 032000

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes Cast-in-Place Concrete for Following Items:
1. Footings.
2. Slabs on grade.
3. Control, expansion, and contraction joint devices.
4. Equipment pads.
5. Light pole base.

B. Related Requirements:

1. Section 031000 - Concrete Forming and Accessories: Formwork and accessories.
2. Section 032000 - Concrete Reinforcing: Requirements for reinforcing steel and supports.
3. Section 079000 - Joint Protection: Requirements for sealants and primers.

1.2 REFERENCE STANDARDS

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 305R - Guide to Hot Weather Concreting.
3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
4. ACI 308.1 - Specification for Curing Concrete.
5. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:
1. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
2. ASTM C33 - Standard Specification for Concrete Aggregates.
3. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
5. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
6. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete.
7. ASTM C150 - Standard Specification for Portland Cement.
8. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
9. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
11. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.
12. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
13. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete.
14. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
15. ASTM C685 - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.

16. ASTM C1017 - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
17. ASTM C1064 - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
18. ASTM C1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
19. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
20. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
21. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
22. 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.
23. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on joint devices, attachment accessories, and admixtures.

C. Design Data:

1. Submit concrete mix design for each concrete strength.
2. Submit separate mix designs if admixtures are required for following:

    a. Hot and cold weather concrete Work.
    b. Air entrained concrete Work.

3. Identify mix ingredients and proportions, including admixtures.
4. Identify chloride content of admixtures and whether or not chlorides were added during manufacture.

D. Manufacturer Instructions: Submit installation procedures and interfacing required with adjacent Work.

E. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.5 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of embedded utilities and components concealed from view in finished construction.

1.6 QUALITY ASSURANCE

A. Perform Work according to ACI 301.

B. Comply with ACI 305R when pouring concrete during hot weather.

C. Comply with ACI 306.1 when pouring concrete during cold weather.

D. Acquire cement and aggregate from one source for Work.

1.7 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Maintain concrete temperature after installation at minimum 50 degrees F for minimum seven days.

PART 2 - PRODUCTS

2.1 PERFORMANCE AND DESIGN CRITERIA

A. Vapor Retarder Permeance: Maximum 1 perm when tested according to ASTM E96, water method.

2.2 MATERIALS

A. Concrete:

1. Cement:

a. Comply with ASTM C150, Type I – Normal.
b. Type: Portland.

2. Normal Weight Aggregates:

a. Comply with ASTM C33.
b. Coarse Aggregate Maximum Size: 1" According to ACI 318.

3. Water:

a. Comply with ACI 318.
b. Potable.

B. Admixtures:

1. Air Entrainment: Comply with ASTM C260.
2. Chemical:

a. Comply with ASTM C494.
b. Type A - Water Reducing.
c. Type B - Retarding.
d. Type C - Accelerating.

3. Fly Ash: Not allowed
4. Silica Fume: Comply with ASTM C1240.
5. Slag:

    a. Description: Ground-granulated blast-furnace slag.
    b. Comply with ASTM C989.

C. Joint Devices and Filler:

1. Joint Filler, Type A:

    a. Description: Asphalt-impregnated fiberboard or felt.
    b. Comply with ASTM D1751.
    c. Thickness: 1/4 inch.
    d. Profile: Tongue-and-groove.

2. Construction Joint Devices:

    a. Material: Integral galvanized steel.
    b. Thickness: 1/4 inch.
    c. Profile: Tongue-and-groove with removable top strip exposing sealant trough and knockout holes spaced at 6 inches o.c.
    d. Furnish ribbed steel spikes with tongue to fit top screed edge.

3. Sealant and Primer: type, as specified in Section 079000 - Joint Protection.

2.3 CONCRETE MIX

A. Select proportions for normal weight concrete according to ACI 301, Method 1.

B. Performance and Design Criteria
1. Exterior Slabs on Grade:
    a. Compressive Strength: 4,000 psi
    b. Cement Type: ASTM C150
    c. Minimum Cement Content: 6 sack
    d. Aggregate Type: Normal weight.
    e. Aggregate Size: 3/4" maximum
    f. Slump: 3 inches, plus or minus 1 inch (25 mm).
    g. Air Content: 4% plus or minus .5%
2. Footings and Grade Beams:
    a. Compressive Strength: 3,000 psi
    b. Cement Type: ASTM C150
    c. Minimum Cement Content: 5.5 sack
    d. Aggregate Type: Normal weight.
    e. Aggregate Size: 3/4" maximum
    f. Slump: 4 inches, plus or minus 1 inch (25 mm).
    g. Air Content: 6% plus or minus 1%
3. Interior Slabs on Grade:
    a. Compressive Strength: 4,000 psi
    b. Cement Type: ASTM C150
    c. Minimum Cement Content: 6 sack
    d. Aggregate Type: Normal weight.
    e. Aggregate Size: 1 ½" maximum
    f. Slump: 3 inches, plus or minus 1 inch (25 mm).

g. Air Content: 1.5% plus or minus .5%

C. Admixtures:

1. Include admixture types and quantities indicated in concrete mix designs only if approved by Architect/Engineer.
2. Cold Weather:

a. Use accelerating admixtures in cold weather.
b. Use of admixtures will not relax cold-weather placement requirements.

3. Hot Weather: Use set-retarding admixtures.

D. Ready-Mixed Concrete: Mix and deliver concrete according to ASTM C94.

E. Site-Mixed Concrete: Mix concrete according to ACI 318.

2.4 ACCESSORIES

A. Vapor Retarder:

1. Description: Clear polyethylene film.
2. Comply with ASTM E1745, Class A.
3. Thickness: 10 mils.
4. Type: As recommended for below-grade application.
5. Joint Tape: As recommended by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify requirements for concrete cover over reinforcement.

C. Verify that anchors, seats, plates, reinforcement, and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Previously Placed Concrete:

1. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.
2. Remove laitance, coatings, and unsound materials.

C. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels, and pack solid with non-shrink grout.

D. Remove debris and ice from formwork, reinforcement, and concrete substrates.

E. Remove water from areas receiving concrete before concrete is placed.

3.3 INSTALLATION

A. Placing Concrete:

1. Place concrete according to ACI 301.
2. Notify testing laboratory minimum 24 hours prior to commencement of operations.
3. Ensure that reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.
4. Install vapor retarder under interior slabs on grade according to ASTM E1643.
5. Lap joints minimum 6 inches and seal watertight by taping edges and ends.
6. Repairs:

    a. Repair vapor retarder damaged during placement of concrete reinforcement.
    b. Using vapor retarder material, lap over damaged areas minimum 6 inches and seal watertight.

7. Joint Filler:

    a. Separate slabs on grade from vertical surfaces with joint filler.
    b. Extend joint filler from bottom of slab to within 1/4 inch of finished slab surface.
    c. Finish Joint Sealer Requirements: As specified in Section 079000 - Joint Protection

8. Joint Devices:

    a. Coordination: Install construction joint devices in coordination with floor slab pattern placement sequence; set top to required elevations; secure to resist movement by wet concrete.
    b. Install joint device anchors, maintaining correct position to allow joint cover to be flush with floor finish.
    c. Install joint covers in longest practical length when adjacent construction activity is complete.
    d. Apply sealants in joint devices as specified in Section 079000 - Joint Protection.

9. Deposit concrete at final position, preventing segregation of mix.
10. Place concrete in continuous operation for each panel or section as determined by predetermined joints.
11. Consolidate concrete.
12. Maintain records of concrete placement, including date, location, quantity, air temperature, and test samples taken.
13. Place concrete continuously between predetermined expansion, control, and construction joints.
14. Do not interrupt successive placement and do not permit cold joints to occur.
15. Place floor slabs in indicated saw-cut pattern.
16. Saw-Cut Joints:

    a. Saw-cut joints within 12 hours after placing.
    b. Use 3/16 inch thick blade.
    c. Cut into 1/4 depth of slab thickness.

17. Screeding:

    a. Screed slabs on grade level.
    b. Surface Flatness: FF 20 maximum 1/4 inch in 10 feet.

B. Concrete Finishing:

1. Provide formed concrete surfaces to be left exposed with sand-floated finish.
2. Finish concrete floor surfaces according to ACI 301.
3. Wood float surfaces receiving quarry tile and ceramic tile with full-bed setting system.
4. Steel trowel surfaces receiving resilient flooring, thin-set quarry tile, thin-set ceramic tile.
5. Steel trowel surfaces indicated to be exposed.
6. In areas with floor drains, maintain floor elevation at walls and pitch surfaces uniformly to drains at 1/8 inch per foot nominal.

C. Curing and Protection:

1. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
2. Protect concrete footings from freezing for minimum of five days.
3. Maintain concrete with minimal moisture loss at relatively constant temperature for period as necessary for hydration of cement and hardening of concrete.
4. Cure floor surfaces according to ACI 301.
5. Spray water over floor slab areas and maintain wetness for seven days.

3.4 FIELD QUALITY CONTROL

A. Section 014000 - Quality Requirements: Requirements for inspecting and testing.

B. Perform testing according to ACI 318.

C. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of Work.

D. Concrete Inspections:

1. Continuous Placement Inspection: Inspect for proper installation procedures.
2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.

E. Strength Test Samples:

1. Sampling Procedures: Comply with ASTM C172.
2. Cylinder Molding and Curing Procedures:

    a. Comply with ASTM C31.
    b. Cylinder Specimens: Standard cured.

3. Sample concrete and make one set of three cylinders for every 150 cu. yd. less of each class of concrete placed each day, and for every 5,000 sq. ft. of surface area for slabs and walls.
4. If volume of concrete for a class of concrete would provide less than five sets of cylinders, take samples from five randomly selected batches, or from every batch if less than five batches are used.
5. Make one additional cylinder during cold weather concreting and field cure.

F. Field Testing:

1. Slump Test Method: Comply with ASTM C143.
2. Air Content Test Method: Comply with ASTM C173.
3. Temperature Test Method: Comply with ASTM C1064.

4. Compressive Strength Concrete:

    a. Measure slump and temperature for each sample.
    b. Measure air content in air-entrained concrete for each sample.

G. Cylinder Compressive Strength Testing:

1. Test Method: Comply with ASTM C39.
2. Test Acceptance: According to ACI 318.
3. Test one cylinder at seven days.
4. Test one cylinder cylinders] at 28 days.
5. Retain one cylinder for testing when requested by Architect/Engineer.
6. Dispose of remaining cylinders if testing is not required.

H. Patching:

1. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.
2. Honeycombing or Embedded Debris in Concrete:

    a. Not acceptable.
    b. Notify Architect/Engineer upon discovery.

3. Patch imperfections according to ACI 301.

I. Defective Concrete:

1. Description: Concrete not conforming to required lines, details, dimensions, tolerances, or specified requirements.
2. Repair or replacement of defective concrete will be determined by Architect/Engineer.
3. Do not patch, fill, touch up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

END OF SECTION 033000

DIVISION 5
METALS



SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Shop-fabricated metal items.
2. Steel lintels.
3. Structural supports for miscellaneous attachments.
4. Fabricated architectural details.

B. Related Requirements:
1. Section 099000 - Painting and Coating: Field-applied paint finish.

1.2 REFERENCE STANDARDS

A. American Welding Society:

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.

B. ASTM International:

1. ASTM A36 - Standard Specification for Carbon Structural Steel.
2. ASTM A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
4. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
5. ASTM F436 - Standard Specification for Hardened Steel Washers.

C. National Ornamental & Miscellaneous Metals Association:

1. NOMMA Guideline 1 - Joint Finishes.

D. SSPC: The Society for Protective Coatings:

1. SSPC - Steel Structures Painting Manual.
2. SSPC Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
3. SSPC Paint 20 - Zinc-Rich Coating (Type I - Inorganic and Type II - Organic).
4. SSPC SP 1 - Solvent Cleaning.
5. SSPC SP 10 - Near-White Blast Cleaning.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

1.4 QUALITY ASSURANCE

A. Finish joints according to NOMMA Guideline 1.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept metal fabrications on-Site in labeled shipments. Inspect for damage.

C. Protect metal fabrications from damage by exposure to weather or by ground contact.

1.6 EXISTING CONDITIONS

A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 LINTELS

A. Description:

1. Steel sections.
2. Size and Configuration:

a. As indicated on Drawings.
b. Length to allow 8-inch minimum bearing on both sides of opening.

3. Exterior Location Finish: Galvanized.
4. Interior Location Finish: Prime paint, one coat.

2.2 FABRICATED ARCHITECTURAL DETAIL

A. Description: Steel sections, size and configuration as indicated on Drawings.

2.3 ANCHORS

A. Description:

1. ASTM A307; Grade A.
2. Shape: Straight.
3. Furnish with nut and washer.
4. Finish: None.

B. Epoxy Adhesive Anchors:

1. Grout: As specified in Section 036000 - Grouting.
2. Threaded Rod: Type 316 stainless steel.

2.4 MATERIALS

A. Steel:

1. Structural Shapes: ASTM A36.
2. Channels and Angles: ASTM A36.
3. Steel Plate: ASTM A36.
4. Bolts: ASTM A307; Grade A or B.
5. Nuts: ASTM A563; heavy-hex type.
6. Washers: ASTM F436; Type 1.
7. Welding Materials: AWS D1.1; type required for materials being welded.

2.5 FABRICATION

A. Fit and shop-assemble items in largest practical sections for delivery to Site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small, uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

G. Fabrication Tolerances:

1. Squareness: 1/8-inch maximum difference in diagonal measurements.
2. Maximum Offset between Faces: 1/16 inch.
3. Maximum Misalignment of Adjacent Members: 1/16 inch.
4. Maximum Bow: 1/8 inch in 48 inches.
5. Maximum Deviation from Plane: 1/16 inch in 48 inches.

2.6 FINISHES

A. Steel:
1. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

2. Do not prime surfaces in direct contact with concrete or where field welding is required.
3. Prime-paint items with one coat except where galvanizing is specified.
4. Galvanizing: ASTM A123; hot-dip galvanize after fabrication.
5. Galvanizing for Fasteners, Connectors, and Anchors:

    a. Hot-Dip Galvanizing: ASTM A153.
    b. Mechanical Galvanizing: ASTM B695; Class 50 minimum.
6. Shop Primer: SSPC Paint 15, Type 1, red oxide.
7. Touchup Primer: Match shop primer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Requirements for installation examination.

B. Verify that field conditions are acceptable and are ready to receive Work.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Clean and strip primed steel items to bare metal where Site welding is required.

3.3 INSTALLATION

A. Install items plumb and level, accurately fitted, and free from distortion or defects.

B. Make provisions for erection stresses. Install temporary bracing to maintain alignment until permanent bracing and attachments are installed.

C. Field-weld components indicated on Drawings.

D. Perform field welding according to AWS D1.1.

E. Obtain approval of Architect/Engineer prior to Site cutting or making adjustments not scheduled.

3.4 TOLERANCES

A. Section 014000 - Quality Requirements: Requirements for tolerances.

B. Maximum Variation from Plumb: 1/4 inch per story or for every 12 feet in height, whichever is greater, non-cumulative.

C. Maximum Variation from Level: 1/16 inch in 3 feet and 1/4 inch in 10 feet.

D. Maximum Offset from Alignment: 1/4 inch.

E. Maximum Out-of-Position: ¼ inch.

3.5 FIELD QUALITY CONTROL

A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

B. Welding: Inspect welds according to AWS D1.1.

C. Replace damaged or improperly functioning hardware.

D. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.

E. Touch up factory-applied finishes according to manufacturer-recommended procedures.

3.6 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.

B. Adjust operating hardware and lubricate as necessary for smooth operation.

END OF SECTION 055000

DIVISION 6
WOOD, PLASTIC AND COMPOSITES



SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Blocking in wall.
2. Wood furring and grounds.
3. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, and wood trim.
4. Telephone and electrical panel backboards.

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
2. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
4. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

B. Forest Stewardship Council:

1. FSC Guidelines - Forest Stewardship Council Guidelines.

C. Southern Pine Inspection Bureau:

1. SPIB - Standard Grading Rules for Southern Pine Lumber.

D. U.S. Department of Commerce National Institute of Standards and Technology:

1. DOC PS 1 - Construction and Industrial Plywood.
2. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
3. DOC PS 20 - American Softwood Lumber Standard.

E. Western Wood Products Association:

1. WWPA 2011 Western Lumber Grade Rules, including supplements.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit technical data and application instructions on wood-preservative and fire-retardant treatment materials.

1.4 QUALITY ASSURANCE

A. Perform Work according to following:

1. Lumber Grading Agency: Certified by DOC PS 20.
2. Wood Structural Panel Grading Agency: Certified by APA - The Engineered Wood Association.
3. Lumber: DOC PS 20.
4. Wood Structural Panels: DOC PS 1 or DOC PS 2.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Lumber Grading Rules: SPIB.

B. Miscellaneous Framing: Stress Group A; 19 percent maximum moisture content.

C. Plywood: APA-rated sheathing, Grade C-D; Exposure Durability 1; unsanded.

2.2 ACCESSORIES

A. Fasteners and Anchors:

1. Fasteners: ASTM A153, hot-dip galvanized steel for high-humidity and treated wood locations, unfinished steel elsewhere.
2. Nails and Staples: ASTM F1667.
3. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolt or ballistic fastener for anchorages to steel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that substrate conditions are ready to receive blocking, curbing, and framing.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Coordinate placement of blocking, curbing, and framing items.

3.3 INSTALLATION

A. Set members level and plumb, in correct position.

B. Place horizontal members, crown side up.

C. Space framing 16 inches o.c.

D. Secure sheathing to framing members with ends over firm bearing and staggered.

E. Install telephone and electrical panel backboards with plywood sheathing material where required. Size backboards 12 inches beyond size of electrical and telephone panel.

END OF SECTION 061053

SECTION 064100 - ARCHITECTURAL WOOD CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Custom casework.
   a. Plastic-laminate-finished casework.
2. Counter tops.
   a. Plastic-laminate-finished counter tops.
3. Cabinet hardware.

1.2 REFERENCE STANDARDS

A. American National Standards Institute:

1. ANSI A135.4 - Basic Hardboard.
2. ANSI A156.9 - Cabinet Hardware.
3. ANSI A208.1 - Mat-Formed Wood Particleboard.

B. APA - The Engineered Wood Association:

1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.

C. Architectural Woodwork Institute, Woodwork Institute, and Architectural Woodwork Manufacturers Association of Canada:

1. AWS - Architectural Woodwork Standards.
2. Supplemented with The WI Approach.

D. ASTM International:

1. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
3. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

E. Forest Stewardship Council:

1. FSC Guidelines - Forest Stewardship Council Guidelines.

F. Hardwood Plywood and Veneer Association:

1. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood.

G. National Electrical Manufacturers Association:

1. NEMA LD 3 - High-Pressure Decorative Laminates.

H. National Fire Protection Association:

1. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

I. U.S. Department of Commerce National Institute of Standards and Technology:

1. DOC PS 20 - American Softwood Lumber Standard.

J. Window and Door Manufacturers Association:

1. WDMA I.S.4 - Water-Repellent Treatment for Millwork.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals, including AWS Section 1.

B. Product Data: Submit data on:
1. High-pressure decorative laminates.
2. Hardware accessories.

C. Shop Drawings:

1. Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location, schedule of finishes, and Certified Compliance Label on each set.

D. Samples:

1. Submit two samples, illustrating cabinet finish.
2. Submit two samples, illustrating counter top finish.
3. Submit two samples illustrating hardware finish.

1.4 QUALITY ASSURANCE

A. Perform Work according to AWS, Section 6, Section 7, Section 10 , and Section 11; custom grade.

B. Surface Burning Characteristics: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.

1.5 QUALIFICATIONS

A. Fabricator: Company specializing in fabricating products specified in this Section with minimum three years' experience similar to this Project.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Protect units from moisture damage.

1.7 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient conditions control facilities for product storage and installation.

B. Maintain storage space relative humidity within ranges indicated in AWS Section 2.

C. Subsequent Conditions: Maintain same temperature and humidity conditions in building spaces as will occur after occupancy during and after installation of Work of this Section.

1.8 EXISTING CONDITIONS

A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

A. Plastic-Laminate-Finished Custom Casework:

1. Frameless construction.
2. Style: Flush overlay.
3. AWS Section 10.
4. Custom grade.
5. Exterior and Interior Exposed Surfaces: High-pressure decorative laminate over medium density fiberboard.
6. Semi-Exposed Surfaces: High-pressure decorative laminate over medium density fiberboard.

B. Casework Construction Details:

1. Drawer Side Joinery: Biscuit jointed.
2. Drawer and Door Edge Profile: Square with inset panel.
3. Toe Base Finish: Room base specified on drawings

C. Plastic-Laminate-Finished Counter Tops: AWS Section 11; custom grade.

1. Core: Exterior plywood
2. Splash Top Profile: Square.
3. Deck at Splash Joint Type: Vertical butt.
4. Front Edge: Self-edge with buildup
5. Splash Assembly: Field assembled.

2.2 CASEWORK MATERIALS

A. Decorative Overlay Plywood: APA/EWA PS 1 and HPVA HP-1; medium-density fiberboard core; melamine or polyester decorative faces; PVC or polyester edge banding; color and pattern as selected.

B. Medium-Density Fiberboard: ANSI A208.2, composed of wood fibers, medium density.

C. High-Pressure Decorative Laminate (HPDL): NEMA LD 3

1. Horizontal Surfaces: HGS; 0.048 in thick
2. Vertical Surfaces: VGS; 0.028 in thick

3. Post-Formed Surfaces: HGP; 0.039 in thick
4. Fire-Resistant Surfaces: HGF; 0.048 in thick.
5. Cabinet Liner: CLS; 0.020 in thick.
6. Backing Sheet: BKL; 0.020 in thick.

2.3 FABRICATION

A. Fabricate casework to AWS Section 10 custom grade.

B. Fabricate counter tops to AWS Section 11 custom grade.

C. Shop-assemble casework for delivery to Site in units easily handled and to permit passage through building openings.

D. Cap exposed high-pressure decorative laminate finish edges with material of same finish and pattern.

E. Door and Drawer Fronts: 3/4 in thick.

F. When necessary to cut and fit on-Site, fabricate materials with ample allowance for cutting. Furnish trim for scribing and Site cutting.

G. Apply high-pressure decorative laminate finish in full, uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Locate plastic laminate joints minimum 18 in from sink cutouts

H. Fabricate cabinets and counter tops with cutouts for plumbing fixtures and inserts. Verify locations of cutouts from on-Site dimensions. Prime paint cut edges.

2.4 ACCESSORIES

A. Adhesive for High-Pressure Decorative Laminates: Type recommended by laminate manufacturer to suit application.

B. Fasteners and Anchors:

1. Fasteners: ASTM A153, hot-dip galvanized steel for high-humidity and treated wood locations, unfinished steel elsewhere.
2. Nails and Staples: ASTM F1667.

C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application.

D. Concealed Joint Fasteners: Threaded steel.

E. Veneer Edge Band: AWS; standard wood veneer edge band matching face veneer.

F. Grommets: Plastic material for cutouts.

G. Shelf Rests: In-line bored holes 1-3/8 in o.c., to within 6 in of top and bottom of opening with four support pins for each shelf.

H. Drawer and Door Pulls:
1. U-shaped pull, steel with satin finish.
2. Size and Spacing: 4 in centers.

I. Drawer Slides: Self-closing, galvanized steel construction, ball bearings separating tracks, rail mounted full extension type

J. Hinges: Concealed Grade butt type, steel with satin finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify adequacy of backing and support framing.

C. Verify location and sizes of utility rough-in associated with Work of this Section.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Prime paint surfaces of woodwork items and assemblies to be in contact with cementitious materials.

3.3 INSTALLATION

A. Install casework according to AWS Section 10 custom grade.

B. Install counter tops according to AWS Section 11 custom grade.

C. Set and secure casework, interior finish carpentry, and counter tops in place; rigid, plumb, and level.

D. Use fixture attachments in concealed locations for wall-mounted components.

E. Use concealed joint fasteners to align and secure adjoining cabinet units and countertops

F. Carefully scribe casework abutting other components, with maximum gaps of 1/32 in. Do not use additional overlay trim for this purpose.

G. Secure woodwork cabinet to floor using appropriate angles and anchorages.

H. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.4 TOLERANCES

A. Section 014000 - Quality Requirements: Requirements for tolerances.

B. Conform to AWS Sections 6 and 10 requirements for the following:

1. Smoothness.
2. Gaps.
3. Flushness.

4. Flatness.
5. Alignment.

C. Maximum Variation from Indicated Position: 1/16 in.

D. Maximum Offset from Alignment with Abutting Materials: 1/32 in.

3.5 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.

B. Adjust moving or operating parts to function smoothly and correctly.

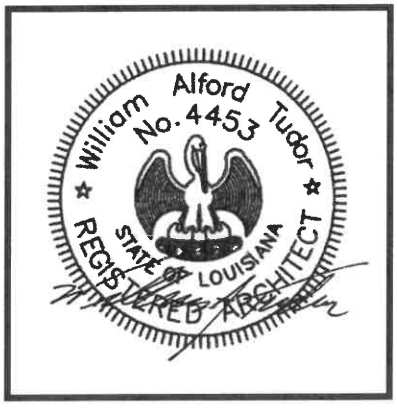
3.6 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION 064100

DIVISION 7
THERMAL AND MOISTURE PROTECTION



SECTION 079000 - JOINT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sealants and joint backing.
2. Hollow gaskets.
3. Accessories.

B. Related Requirements:
1. Section 088000 - Glazing: Glazing sealants and accessories.
2. Section 092116 - Gypsum Board Assemblies: Acoustic sealant.
3. Section 093000 - Tiling: Sealant used as tile grout.

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C834 - Standard Specification for Latex Sealants.
2. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.
3. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
4. ASTM C1193 - Standard Guide for Use of Joint Sealants.
5. ASTM D1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
6. ASTM D1667 - Standard Specification for Flexible Cellular Materials - Poly(Vinyl Chloride) Foam (Closed-Cell).
7. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with Sections referencing this Section.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer information indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Manufacturer Instructions: Submit special procedures, surface preparation requirements, and perimeter conditions requiring special attention.

E. Qualifications Statements:

1. Submit qualifications for manufacturer and applicator.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

B. Applicator: Company specializing in performing Work of this Section with minimum three years' experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

C. Store products according to manufacturer instructions.

D. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.7 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Maintain temperature and humidity as recommended by sealant manufacturer during and after installation.

1.8 WARRANTY

A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.

B. Furnish two-year installer's warranty.

C. Include coverage for:

1. Installed sealants and accessories failing to achieve watertight seal.
2. Installed sealants and accessories exhibiting loss of adhesion or cohesion.
3. Sealants that do not cure.

PART 2 - PRODUCTS

2.1 JOINT SEALERS BY APPLICATION

A. High-Performance General-Purpose Exterior (Nontraffic) Sealant:

1. Material: Silicone.
2. Comply with ASTM C920, Grade NS, Class 25, Uses M, G, and A.
3. Type: Single-component.
4. Color: Standard; match finished surfaces.
5. Applications:

    a. Control, expansion, and soft joints in masonry.
    b. Joints between concrete and other materials.
    c. Joints between metal frames and other materials.
    d. Other exterior nontraffic joints for which no other sealant is indicated.

B. General-Purpose Traffic-Bearing Sealant:

1. Material: Polyurethane.
2. Comply with ASTM C920, Grade P, Class 25, Use T.
3. Type: Single-component.
4. Color: Standard; match finished surfaces.
5. Applications: Exterior and interior pedestrian and vehicular traffic-bearing joints.

C. Exterior Compressible Gasket Expansion Joint Sealer:

1. Description: Hollow neoprene (polychloroprene) compression gasket.
2. Comply with ASTM D2628.
3. Color: Black.
4. Size and Shape: As indicated on Drawings.
5. Applications: Exterior wall expansion joints.

D. Exterior Metal Lap Joint Sealant:

1. Material: Butyl or polyisobutylene.
2. Type: Non-drying, non-skinning, non-curing.
3. Applications: Concealed sealant bead in sheet metalwork.

E. General Purpose Interior Sealant:

1. Material: Acrylic-emulsion latex.
2. Comply with ASTM C834.
3. Type: Single-component; paintable.
4. Color: Standard; match finished surfaces.
5. Applications:

    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.

F. Sanitary Sealant:

1. Material: Silicone.

2. Comply with ASTM C920, Uses M and A.
3. Type: Single-component; mildew resistant.
4. Color: Clear.
5. Applications:

    a. Joints between plumbing fixtures and floor and wall surfaces.
    b. Joints between countertops and wall surfaces.

2.2 JOINT SEALERS BY TYPE

A. Acrylic-Emulsion Latex Sealant:

1. Comply with ASTM C834.
2. Type: Single-component; non-staining, non-bleeding, non-sagging.
3. Movement Capability: 2 to 5 percent.
4. Service Temperature Range: 2 to 160 deg. F.
5. Hardness Range: Shore A, 15 to 40.

B. Butyl Sealant:

1. Comply with ASTM C920, Grade NS, Class 12-1/2, Use NT.
2. Type: Single-component; solvent release curing; non-skinning, non-sagging.
3. Movement Capability: Plus and minus 12-1/2 percent.
4. Service Temperature Range: Minus13 to plus 180 deg. F.
5. Hardness Range: Shore A, 10 to 30.

C. Non-sag Polyurethane Sealant:

1. Comply with ASTM C920, Grade NS, Class 25, Uses NT and M.
2. Type: Single-component; chemical curing; non-staining, non-bleeding, non-sagging.
3. Movement Capability: Plus and minus 25 percent.
4. Service Temperature Range: Minus 40 to plus 180 deg. F.
5. Hardness Range: Shore A, 20 to 35.

D. Self-Leveling Polyurethane Sealant:

1. Comply with ASTM C920, Grade P, Class 25, Uses T, M, and A.
2. Type: Single-component; chemical curing; non-staining, non-bleeding; self-leveling.
3. Movement Capability: Plus and minus 25 percent.
4. Service Temperature Range: Minus 40 to plus 180 deg. F.
5. Hardness Range: Shore A, 20 to 35.

E. Silicone Sealant:

1. Comply with ASTM C920, Grade NS, Class 25, Uses NT and A.
2. Type: Single-component; neutral curing; non-sagging, non-staining, non-bleeding; fungus resistant.
3. Movement Capability: Plus 40 percent, minus 25 percent.
4. Service Temperature Range: Minus 65 to plus 180 deg. F.
5. Hardness Range: Shore A, 15 to 35.

2.3 ACCESSORIES

A. Primer:

1. Type: Non-staining.
2. As recommended by sealant manufacturer to suit application.

B. Joint Cleaner:

1. Type: Non-corrosive and non-staining.
2. As recommended by sealant manufacturer.
3. Compatible with joint forming materials.

C. Joint Backing:

1. Description: Round foam rod, compatible with sealant.
2. Comply with ASTM D1056, sponge or expanded rubber.
3. Size: Oversized 30 to 50 percent larger than joint width.

D. Bond Breaker:

1. Description: Pressure-sensitive tape.
2. As recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application examination.

B. Verify that substrate surfaced and joint openings are ready to receive Work of this Section.

C. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application preparation.

B. Comply with ASTM C1193.

C. Remove loose materials and foreign matter that could impair adhesion of sealant.

D. Clean and prime joints.

E. Protect elements surrounding Work of this Section from damage or disfiguration.

3.3 APPLICATION

A. Comply with ASTM C1193.

B. Measure joint dimensions and size joint backers to achieve following:

1. Width to Depth Ratio: 2:1.
2. Neck Dimension: No greater than 1/2 of joint width.
3. Surface Bond Area on Each Side: Not less than 75 percent of joint width.

C. Install bond breaker where joint backing is not used.

D. Apply sealant free of air pockets, foreign embedded matter, ridges, and sags.

E. Joint Tooling: Concave.

F. Compression Gaskets:

1. Avoid joints except at ends, corners, and intersections.
2. Seal joints with adhesive.
3. Install with face 1/8 to 1/4 inch below adjoining surface.

3.4 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Clean adjacent soiled surfaces.

3.5 PROTECTION

A. Section 017000 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect sealants until cured.

END OF SECTION 079000

DIVISION 8
DOORS AND WINDOWS



SECTION 081213.13 - STANDARD HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fire rated, non-rated, and thermally insulated steel frames.

1. Provide frames for interior and exterior glazed lights.

B. Related Sections:
1. Section 081314 - Standard Steel Doors.
2. Section 087100 - Door Hardware: Hardware and silencers, and weatherstripping.
3. Section 088000 - Glazing.

1.2 REFERENCES

A. American National Standards Institute:

1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

B. ASTM International:

1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. National Fire Protection Association:

1. NFPA 80 - Standard for Fire Doors, Fire Windows.
2. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and other Opening Protectives.
3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

D. Underwriters Laboratories Inc.:

1. UL 10B - Fire Tests of Door Assemblies.
2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
3. UL 1784 - Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacing, location of cut-outs for hardware, and finish.

C. Product Data: Submit frame configuration and finishes.

D. Manufacturer's Installation Instructions: Submit special installation instructions.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Conform to requirements of ANSI A250.8.

B. Fire Rated Frame Construction: Conform to NFPA 252.

C. Installed Fire Rated Frame Assembly: Conform to NFPA 80 for fire rated class same as fire door.

D. Smoke and Draft Control Door Frames: Tested in accordance with UL 1784 and installed in accordance with NFPA 105.

1. Air Leakage: Maximum 3.0 cfm/sf (0.0154 cu m/s/sq m) of door opening with 0.10 inch water gage (24.9 Pa) pressure differential.

E. Attach label from agency approved by authority having jurisdiction to identify each fire rated door frame.

1. Attach smoke label to smoke and draft control door frames.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Product storage and handling requirements.

B. Accept frames on site in manufacturer's packaging. Inspect for damage.

C. Break seal on-site to permit ventilation.

1.7 COORDINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with frame opening construction, door, and hardware installation.

C. Sequence installation to accommodate required door hardware electric wire connections.

PART 2 - PRODUCTS

2.1 STANDARD STEEL FRAMES

A. Product Description: Standard shop fabricated steel frames , fire rated and non-rated types.
1. Exterior Frames:
a. Level 3 for Door Models 1, nominal 14 gage thick material, base metal thickness.

2. Interior Frames:
   a. Level 2 for Door Models 1, nominal 16 gage/0.053 inch thick material, base metal thickness.

2.2 ACCESSORIES

A. Bituminous Coating: Non-asbestos fibered asphalt emulsion.

B. Primer: ANSI A250.10 rust inhibitive type.

C. Silencers: Specified in Section 087100. Resilient rubber fitted into drilled hole.

D. Weatherstripping: Specified in Section 087100.

2.3 FABRICATION

A. Fabricate frames as welded unit for gypsum board slip on type, except for exterior.

B. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.

C. Fabricate frames with hardware reinforcement plates welded in place.

D. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.

E. Prepare frames for silencers. Provide three single silencers for single doors on strike side. Provide two single silencers on frame head at double doors without mullions.

F. Fabricate frames to suit masonry wall coursing with appropriate head member.

2.4 SHOP FINISHING

A. Primer: Air dried.

B. Coat inside of frame profile with bituminous coating to minimum thickness of 1/16 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

A. Install frames in accordance with ANSI A250.8.

B. Coordinate with gypsum board wall construction for anchor placement.

C. Coordinate installation of glass and glazing specified in Section 088000.

D. Coordinate installation of frames with installation of hardware specified in Section 087100 and doors in Section 081313.

E. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.3 ERECTION TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

END OF SECTION 081213.13

SECTION 081313.13 - STANDARD HOLLOW METAL DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes non-rated, fire rated, and thermally insulated steel doors.

B. Related Sections:

1. Section 081214 - Standard Steel Frames.
2. Section 087100 - Door Hardware.
3. Section 088000 - Glazing: Glass for doors.
4. Section 099000 - Painting and Coating: Field painting of doors.

1.2 REFERENCES

A. American National Standards Institute:

1. ANSI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.

B. ASTM International:

1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM C1363 - Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
4. ASTM E413 - Classification for Rating Sound Insulation.

C. Hollow Metal Manufacturers Association:

1. HMMA 810 - Hollow Metal Doors.

D. National Fire Protection Association:

1. NFPA 80 - Standard for Fire Doors, Fire Windows.
2. NFPA 105 - Standard for the Installation of Smoke Door Assemblies and other Opening Protectives.
3. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

E. Steel Door Institute:

1. SDI 108 - Recommended Selection and Usage Guide for Standard Steel Doors.

F. Underwriters Laboratories Inc.:

1. UL 10B - Fire Tests of Door Assemblies.
2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
3. UL 1784 - Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing, and finishes.

C. Product Data: Submit door configurations, location of cut-outs for hardware reinforcement.

D. Manufacturer's Installation Instructions: Submit special installation instructions.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ANSI A250.8.

B. Fire Rated Door Construction: Conform to NFPA 252.

C. Fire Rated Stair Doors: Rate of rise of 450 degrees F (250 degrees C) across door thickness.

D. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.

E. Smoke and Draft Control Doors: Tested in accordance with UL 1784 and installed in accordance with NFPA 105.

1. Air Leakage: Maximum 3.0 cfm/sf (0.0154 cu m/s/sq m) of door opening with 0.10 inch water gage (24.9 Pa) pressure differential.

F. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.

1. Indicate temperature rise rating for stair doors.
2. Attach smoke label to smoke and draft control doors.

G. Surface Burning Characteristics:

1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing work of this section with minimum 3 years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Protect doors with resilient packaging.

C. Accept doors on site in manufacturer's packaging. Inspect for damage.

D. Break seal on site to permit ventilation.

1.7 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work with door opening construction, door frame, and door hardware installation.

C. Coordinate installation to accommodate door hardware electric wire connections.

PART 2 - PRODUCTS

A. Product Description:

1. Exterior Doors (Insulated): ANSI A250.8, 1-3/4 inch thick.
   a. Level 2 - Heavy Duty, Model 1, full flush design.

2. Interior Doors (Non-Rated): ANSI A250.8, 1-3/4 inch thick.
   a. Level 2 - Heavy Duty, Model 1, full flush design.

3. Interior Doors (Fire Rated): ANSI A250.8, 1-3/4 inch thick.
   a. Level 2 - Heavy Duty, Model 1, full flush design.

2.2 COMPONENTS

A. Face: Steel sheet in accordance with ANSI A250.

B. End Closure: Channel, 0.04 inches thick, flush.

C. Core: Type needed to achieve fire rating.

D. Exterior Door Core: Insulated, Total insulation R-Value of 7, measured in accordance with ASTM C1363.

2.3 ACCESSORIES

A. Primer: ANSI A250.10 rust inhibitive type.

2.4 FABRICATION

A. Fabricate doors with hardware reinforcement welded in place.

2.5 SHOP FINISHING

A. Primer: Air dried.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

A. Install doors in accordance with ANSI A250.8.

B. Coordinate installation of glass and glazing specified in Section 088000.

C. Coordinate installation of doors with installation of frames specified in Section 081214 and hardware specified in Section 087100.

D. Touch-up damaged shop finishes.

3.3 ERECTION TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.4 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Requirements for adjusting.

B. Adjust door for smooth and balanced door movement.

END OF SECTION 081313.13

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes overhead coiling door and shutter, operating hardware, manual operation.

B. Related Sections:

1. Section 055000 - Metal Fabrications: Support framing.
2. Section 087100 - Door Hardware: Product Requirements for cylinder core and keys for placement by this section.
3. Section 099000 - Painting and Coating: Field paint finish.

1.2 REFERENCES

A. ASTM International:

1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. Intertek Testing Services (Warnock Hersey Listed):

1. WH - Certification Listings.

C. Underwriters Laboratories Inc.:

1. UL - Building Materials Directory.
2. UL 10B - Fire Tests of Door Assemblies.
3. UL 325 - Door, Drapery, Gate, Louver, and Window Operators and Systems.

1.3 SYSTEM DESCRIPTION

A. Manual Operation: Manual hand chain lift unit with overhead counter balance device, requiring 25 lb nominal force to operate.

1.4 DESIGN REQUIREMENTS

A. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf, with maximum deflection of 1/120, and without damage to door, shutter, or assembly components.

B. Operation: Design door assembly to operate for not less than 20,000 cycles.

1.5 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

C. Product Data: Submit general construction, component connections and details.

D. Samples: Submit samples illustrating shape, color and finish texture.

E. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, and adjustment and alignment procedures.

1.6 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.7 QUALITY ASSURANCE

A. Surface Burning Characteristics:

1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

B. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing work of this section with minimum 3 years experience and approved by manufacturer.

PART 2 - PRODUCTS

2.1 OVERHEAD COILING DOORS

A. Product Description:

1. Manual Operation: Manual hand chain lift] unit with overhead counter balance device, requiring 25 lb nominal force to operate.

2.2 COMPONENTS

A. Curtain: Conform to following:

1. Steel Slats: Interlocking, minimum 24 gage of ASTM A653/A653M steel, minimum galvanized coating designation G90 coating class.

a. Type: Sandwich slat construction with manufacturer's standard insulated core.

2. Nominal Slat Size: 2 inches wide by required length.
3. Slat Ends: Each slat fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
4. Curtain Bottom: Fitted with angles, channels, or tubes to provide reinforcement and positive contact with floor or counter in closed position.

B. Guides: Minimum 3/16 inch; galvanized steel conforming to ASTM A653/A653M, minimum galvanized coating designation G90 coating class.

1. Furnish continuous angles of profile to retain door or shutter in place; mounting brackets of same metal.

C. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension.

D. Hood Enclosure and Facia: Square shape, minimum 24 gage galvanized steel; internally reinforced to maintain rigidity and shape.

E. Hardware:

1. Locks: Furnish locks to allow doors and shutters to be secured.

a. Manual Doors: Manufacturer's standard cylinder dead lock on inside at door jamb, key operated.

2. Cylinders: Furnished under Section 087100, installed as part of Work of this section; master keyed.
3. Handle: Inside center mounted, adjustable keeper, spring activated latch bar with feature to keep in locked or retracted position; interior handle.
4. Weatherstripping (Exterior Assemblies): Moisture and rot proof, resilient type for complete weathertight installation.

2.3 SHOP FINISHING

A. Curtain Slats and hood enclosure: Precoated paint finish, manufacturer's standard type; color as selected.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify opening sizes, tolerances and conditions are acceptable.

3.2 INSTALLATION

A. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

B. Securely and rigidly brace components suspended from structure.

C. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

D. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 079000.

E. Install perimeter trim and closures.

3.3 ERECTION TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Maintain dimensional tolerances and alignment with adjacent Work.

C. Maximum Variation From Plumb: 1/16 inch.

D. Maximum Variation From Level: 1/16 inch.

E. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.4 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Adjust door, shutter, hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Final cleaning.

B. Clean door, shutter, and components.

C. Remove labels and visible markings.

END OF SECTION 083323

SECTION 085113 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Extruded aluminum windows.
2. Factory glazing.
3. Operating hardware.
4. Insect screens.

B. Related Requirements:

1. Section 055000 - Metal Fabrications: Steel lintels.
2. Section 061053 - Miscellaneous Rough Carpentry: Wood perimeter shims.
3. Section 079000 - Joint Protection: Perimeter sealant and backup materials.
4. Section 088000 - Glazing: Exterior and interior glass and plastic glazing materials, for shop or Site installation.

1.2 REFERENCE STANDARDS

A. A. American Architectural Manufacturers Association:

1. AAMA 101 - North American Fenestration Standard/Specification for windows, doors, and skylights.
2. AAMA 501 - Methods of Test for Exterior Walls.
3. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products.
4. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems.
5. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
6. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
7. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
8. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
9. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
10. AAMA IPCB - Standard Practice for the Installation of Windows and Doors in Commercial Buildings.
11. AAMA MCWM-1 - Metal Curtain Wall Manual.

B. American Society of Civil Engineers:

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International:

1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
3. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
4. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
5. ASTM D3656/D3656M - Standard Specification for Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
6. 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.
7. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
8. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.
9. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
10. 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.
11. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
12. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
13. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.

D. Consumer Product Safety Commission:

1. 16 CFR 1201- Safety Standard for Architectural Glazing Materials.

E. Glass Association of North America:

1. GANA Glazing Manual.

F. Green Seal:

1. GC-03 - Anti-Corrosive Paints.

G. National Fenestration Rating Council:

1. NFRC 100 - Procedure for Determining Fenestration Product U-factors.

H. SSPC: The Society for Protective Coatings:

1. SSPC Paint 20 - Zinc-Rich Coating (Type I - Inorganic and Type II - Organic).
2. SSPC Paint 25 - Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel (Type I and Type II).

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit manufacturer information showing component dimensions, anchorage and fasteners, glass, internal drainage, and typical details.

C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related Work, and installation requirements.

D. Samples:

1. Submit samples, illustrating, factory-finished aluminum surfaces

E. Manufacturer's Certificate:

1. Certify that products meet or exceed specified requirements.
2. Certify product performance ratings by independent third party such as AAMA, California Association of Window Manufacturers, or NFRC as meeting or exceeding specified requirements.

F. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

G. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

H. Qualifications Statements:

1. Submit qualifications for manufacturer and installer.
2. Submit manufacturer's approval of installer.

1.4 QUALITY ASSURANCE

A. Perform Work according to following:

1. Aluminum Windows: Fabricate and label window assemblies according to AAMA 101 for types of windows required.
2. Insulated Glass: Fabricate insulated glass units according to GANA Glazing Manual.
3. Safety Glass: Comply with CPSC 16 CFR 1201 and applicable codes.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

B. Installer: Company specializing in performing Work of this Section with minimum three years' experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.

C. Store materials according to manufacturer instructions.

D. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Covering:

a. Protect factory-finished aluminum surfaces with wrapping.
b. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

3. Provide additional protection according to manufacturer instructions.

E. Handling: Comply with AAMA MCWM-1.

1.7 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Minimum Conditions: Do not install glazing materials when ambient temperature is less than 40 degrees F.

C. Subsequent Conditions: Maintain minimum temperature of 40 degrees F during and after installation of glazing materials.

PART 2 - PRODUCTS

2.1 ALUMINUM WINDOWS

A. Description:

1. Aluminum window units, sash, glass and glazing, operating hardware, and insect screen.
2. Aluminum Windows: Thermally broken with interior portion of frame insulated from exterior portion.

B. Window Configuration:

1. Comply with AAMA 101.
2. Sash Designation: H - hung

C. Performance and Design Criteria:

1. Aluminum Windows: Meet minimum performance criteria for AAMA 101 Designation LC20 Light Commercial or better.
2. Dead and Live Loads: Positive and negative wind loads acting normal to plane of window as calculated according to applicable code and as tested according to ASTM E330/E330M.
3. Assembly: Accommodate, without damage to components or deterioration of seals, movement between window and perimeter framing and deflection of lintel.
4. Vapor Seal: Test glass seal with interior atmospheric static pressure of 1 inch, 140 degrees F, and continuous UV and water spray exposure, without seal failure.
5. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, and migrating moisture occurring within system to exterior via weep drainage network.

6. Air Infiltration: Limit through assembly to 0.1 cfm/sq. ft. of wall area, measured at reference differential pressure across assembly of 6.24 psf and tested according to ASTM E283.
7. Thermal Performance:
    a. Condensation Resistance Factor Class: Not less than C45 when measured according to AAMA 1503.
    b. Thermal Transmittance of Assembly: Maximum U-value of 0.45 Btu/sq. ft. x h x deg. F when measured according to AAMA 1503.
8. Water Leakage: None, when measured according to ASTM E331 with test pressure difference as defined by AAMA 101.
9. Vapor Seal: Limit vapor seal with interior atmospheric static pressure of 1 inch, 72 degrees F, and 40 percent relative humidity, without seal failure.

2.2 COMPONENTS

A. Extruded Aluminum:

1. Description: 6063 alloy, T5 temper.

B. Sheet Aluminum:

1. Description: 5005 alloy, H15 or H34 temper.

C. Steel Sections: Profiled to suit mullion sections.

D. Insulating Glass:

1. Description: Sealed double-pane units as specified in Section 088000 - Glazing.
2. Outer Pane: Tinted Low-E float glass.
3. Inner Pane: Clear float glass.
4. Pane Thickness: Minimum 1/8 inch.
5. Minimum Total Unit Thickness: 1 inch.
6. Glazing Materials: Manufacturer's standard.

E. Hardware:
1. Sash Lock: Lever handle with cam lock.

F. Sills:

1. Material: Extruded aluminum.
2. Type: One piece full width of opening; jamb angles to terminate sill end.
3. Slope: For positive wash.
4. Fit under sash 1/2 inch beyond wall face.

G. Operable Sash Weatherstripping:

1. Material: Nylon pile.
2. Permanently resilient.
3. Profiled to effect weather seal.

H. Insect Screen Frame:

1. Material: Rolled aluminum frame of rectangular sections.
2. Fit with adjustable hardware.

3. Nominal Size: Similar to operable glazed unit.

I. Insect Screens:

1. Comply with ASTM D3656/D3656M, Class 2.
2. Mesh: 20 by 20.
3. Color: Charcoal.

2.3 FABRICATION

A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly while enabling installation and dynamic movement of perimeter seal.

B. Make joints flush, hairline, and weatherproof.

C. Prepare components to receive fabricated anchor devices.

D. Arrange fasteners and attachments to ensure concealment from view.

E. Prepare components with internal reinforcement for operating hardware.

F. Furnish internal reinforcement in mullions with galvanized steel members to maintain rigidity.

G. Drainage: Permit internal drainage weep holes and channels to migrate moisture to exterior.

H. Insect Screen:

1. Assemble insect screen frame and miter and reinforce frame corners.
2. Fit mesh taut into frame and secure.
3. Fit frame with four spring-loaded steel-pin retainers.

I. Glazing:

1. Factory-glaze window units.

2.4 FINISHES

A. Coatings: Comply with AAMA 2603.

B. Color Anodized Aluminum Surfaces:

1. AA-M12C22A44 nonspecular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class I 0.7 mil.
2. Anodizing: Dark bronze.

C. Locks, Operators, and Exposed Hardware: Match window finish.

D. Screens: Manufacturer's standard black color.

E. Apply one coat of bituminous paint on concealed aluminum surfaces in contact with cementitious or dissimilar materials.

F. Galvanizing for Steel Reinforcement:

1. Comply with ASTM A123/A123M.
2. Hot-dip galvanize after fabrication.

G. Galvanizing for Nuts, Bolts, and Washers: Comply with ASTM A153/A153M.

2.5 ACCESSORIES

A. Fasteners and Anchors: Stainless steel.

B. Bituminous Paint: Fibered asphaltic type.

C. Window Washing Anchors: Stainless steel conforming to applicable codes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive Work of this Section.

C. Verify that opening dimensions and clearances are properly sized to receive window units.

3.2 INSTALLATION

A. Comply with requirements of AAMA IPCB.

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warping or twisting.

D. Maintain dimensional tolerances and alignment with adjacent Work.

E. Install sill and sill end angles.

F. Thermal Barrier:

1. Provide thermal isolation where components penetrate or disrupt building insulation.
2. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

G. Coordinate attachment and seal of perimeter air barrier and vapor retarder materials.

H. Perimeter Sealants: As specified in Section 079000 - Joint Protection.

3.3 TOLERANCES

A. Section 014000 - Quality Requirements: Requirements for tolerances.

B. Maximum Variation from Level or Plumb: 1/16 inch/3 feet noncumulative, or 1/8 inch/10 feet, whichever is less.

3.4 FIELD QUALITY CONTROL

A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

B. Inspection: Monitor quality of installation and glazing.

3.5 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.

B. Adjust hardware for smooth operation and for secure weathertight closure.

3.6 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Remove protective material from factory-finished aluminum surfaces.

C. Wash surfaces according to method recommended by and acceptable to sealant and window manufacturers; rinse and wipe surfaces clean.

D. Remove excess sealant using moderate amounts of mineral spirits or other solvent acceptable to sealant and window manufacturers.

END OF SECTION 085113

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes hardware for steel doors.

1. Provide door gaskets, including weatherstripping and seals, and thresholds.

B. Related Sections:
1. Section 064100 - Architectural Wood Casework: Cabinet hardware.
2. Section 081214 - Standard Steel Frames: Silencers integral with steel frames.
3. Section 081314 - Standard Steel Doors.
4. Section 101400 - Signage.

1.2 REFERENCES

A. American National Standards Institute:

1. ANSI A156.1 - Butts and Hinges.
2. ANSI A156.2 - Bored and Preassembled Locks and Latches.
3. ANSI A156.3 - Exit Devices.
4. ANSI A156.4 - Door Controls - Closures.
5. ANSI A156.5 - Auxiliary Locks and Associated Products.
6. ANSI A156.6 - Architectural Door Trim.
7. ANSI A156.7 - Template Hinge Dimensions.
8. ANSI A156.8 - Door Controls - Overhead Holders.
9. ANSI A156.12 - Interconnected Locks and Latches.
10. ANSI A156.13 - Mortise Locks and Latches.
11. ANSI A156.14 - Sliding and Folding Door Hardware.
12. ANSI A156.15 - Closer Holder Release Devices.
13. ANSI A156.16 - Auxiliary Hardware.
14. ANSI A156.18 - Materials and Finishes
15. ANSI A156.19 - Power Assist and Low Energy Power Operated Doors.
16. ANSI A156.23 - Electromagnetic Locks.
17. ANSI A156.24 - Delayed Egress Locks.
18. ANSI A156 - Complete Set of 24 BHMA Standards (A156 Series) with Binder.

B. Builders Hardware Manufacturers Association:

1. BHMA Directory of Certified Products.

C. National Fire Protection Association:

1. NFPA 80 - Standard for Fire Doors, Fire Windows.
2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

D. Underwriters Laboratories Inc.:

1. UL 10B - Fire Tests of Door Assemblies.

2. UL 305 - Panic Hardware.
3. UL - Building Materials Directory.

E. Intertek Testing Services (Warnock Hersey Listed):

1. WH - Certification Listings.

1.3 PERFORMANCE REQUIREMENTS

A. Fire Rated Openings: Provide door hardware listed by UL or Intertek Testing Services (Warnock Hersey Listed), or other testing laboratory approved by applicable authorities.

1. Hardware: Tested in accordance with NFPA 252.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: 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 lists and templates.

C. Samples:

1. Submit one sample illustrating style, color, and finish.

D. Manufacturer's Installation Instructions: Submit special procedures, and perimeter conditions requiring special attention.

1.5 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual 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.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with the following requirements:

1. ANSI A156 series.
2. NFPA 80.
3. UL 305.

B. Furnish hardware marked and listed in BHMA Directory of Certified Products.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Hardware Supplier: Company specializing in supplying commercial door hardware with minimum three years' experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - 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.

1.9 COORDINATION

A. Section 013000 - 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. Sequence installation to accommodate required utility connections.

D. Coordinate Owner's keying requirements during course of Work.

1.10 WARRANTY

A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish two year manufacturer warranty for locksets and door closers.

1.11 MAINTENANCE MATERIALS

A. Section 017000 - Execution and Closeout Requirements: Maintenance materials.

B. Furnish special wrenches and tools applicable for each different and for each special hardware component.

C. Furnish maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 - PRODUCTS

2.1 DOOR HARDWARE

A. Manufacturers:
1. Best Access Systems; Stanley Security Solutions, Inc.

2. DORMA Architectural Hardware; a division of DORMA Group North America. (DAH)
3. Falcon; an Ingersoll-Rand brand.
4. Glynn-Johnson; an Ingersoll-Rand brand.
5. Hager Companies. (HAG)
6. Ives; an Ingersoll Rand brand. (IVS)
7. LCN; an Ingersoll-Rand brand.
8. National Guard Products, Inc. (NGP)
9. Schlage; an Ingersoll-Rand brand. (SCH)
10. Stanley Commercial Hardware; a division of Stanley Security Solutions.
11. Von Duprin; an Ingersoll-Rand brand.
12. Substitutions: Permitted.

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. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.
2. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by hardware supplier or hardware manufacturer.
3. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.

    a. Finish: Match hardware item being fastened.

4. Fire Ratings: Provide hardware with UL or Intertek Testing Services (Warnock Hersey Listed) listings for type of application involved.

B. Hinges: ANSI A156.1, full mortise type complying with following general requirements unless otherwise scheduled.

1. Widths: Sufficient to clear trim projection when door swings 180 degrees.
2. Number: Furnish minimum three hinges to 90 inches high, four hinges to 120 inches high for each door leaf.
3. Size and Weight: 4-1/2 inch heavy weight typical for 1-3/4 inch doors.

    a. Doors Over 40 inches Wide: Extra heavy weight ball or oilite bearing hinges.
    b. Doors Over 48 inches Wide: 5 inch extra heavy weight ball or oilite bearing.

4. Pins: Furnish nonferrous hinges with non-removable pins (NRP) at exterior and locked outswinging doors, non-rising pins at interior doors.
5. Tips: Flat button.

C. Locksets: Furnish locksets compatible with specified cylinders. Typical 2-3/4 inch backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt verify type of cutouts provided in metal frames.
1. Bored (Cylindrical) Locksets: ANSI A156.2, Series 4000, Grade 1 unless otherwise indicated.
2. Preassembled (Unit) Locksets: ANSI A156.12, Series 2000, Grade 1 unless otherwise indicated.

D. Latch Sets: Match locksets. Typical 2-3/4 inch backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt verify type of cutouts provided in metal frames.
1. Bored (Cylindrical) Latch Sets: ANSI A156.2, Series 4000, Grade 2 unless otherwise indicated.

E. Exit Devices: ANSI A156.3, Grade 1 [concealed vertical rod type] [rim type], with [push pad] [cross bar], unless otherwise indicated. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt [verify type of cutouts provided in metal frames], with [dust-proof] floor strikes.

1. Types: Suitable for doors requiring exit devices.
2. Coordinators: Furnish overhead [concealed in frame] type at pairs of doors.

F. Cylinders: ANSI A156.5, Grade 1, 6 pin type removable cylinders
1. Keying: Keyed as directed by Owner.
2. Include construction keying.
3. Keys: Nickel silver. Stamp keys with "DO NOT DUPLICATE".
4. Supply keys in the following minimum quantities:

   a. 5 master keys.
   b. 3 grand master keys.
   c. 3 great grand master keys.
   d. 3 construction keys.
   e. 3 control keys and 10 extra cylinder cores.
   f. 2 change keys for each lock.

G. Closers: ANSI A156.4 modern type with cover, surface mounted closers; full rack and pinion type with steel spring and non-freezing hydraulic fluid; closers required for fire rated doors unless otherwise indicated.

1. Adjustability: Furnish controls for regulating closing, latching, speeds, and back checking.
2. Arms: Type to suit individual condition; parallel-arm closers at reverse bevel doors and where doors swing full 180 degrees.
3. Location: Mount closers on inside of exterior doors, room side of interior doors typical; mount on pull side of other doors.
4. Operating Pressure: Maximum operating pressure as follows.

   a. Interior Doors: Maximum 5 pounds.
   b. Exterior Doors: Maximum 8.5 pound.
   c. Fire Rated Doors: As required for fire rating, maximum 15 pounds (66.6 N).

H. Push/Pulls, Manual Bolts, Protection Plates, Gaskets, Thresholds, and Trim: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.

1. Push/Pulls: ANSI A156.6; push plates minimum 0.050 inch thick. Furnish straight type pulls with bolts to secure from opposite door face; furnish with minimum 0.050 inch pull plates unless otherwise indicated.
2. Manual Bolts: ANSI A156.16 Grade 1 top and bottom flush bolts, with dust-proof floor strike, unless otherwise indicated.
3. Kickplates: ANSI A156.6, metal; height indicated in Schedule by 1 inch less than door width; minimum 0.050 inch thick stainless steel
4. Weatherstripping: Furnish continuous weatherstripping at top and sides of exterior doors.
5. Fire Rated Gaskets: Furnish continuous fire rated gaskets at top and sides of fire rated doors.
6. Thresholds: Maximum 1/2 inch (12 mm) height.
7. Wall Stops: ANSI A156.1, Grade 1, 3 inch wall stop convex pad wall stop with no visible screws.
8. Floor Stops: ANSI A156.1 Grade 1 dome type with no visible screws; furnish with accessories as required for applications indicated.

2.3 ACCESSORIES

A. Through Bolts: Do not permit through bolts and grommet nuts on door faces in occupied areas unless no alternative is possible.

2.4 FINISHING

A. Finishes: ANSI A156.18; furnish following finishes except where otherwise indicated in Schedule at end of section.

1. Hinges:
   a. BHMA 630 and 626, satin finish.

2. Typical Exterior Exposed and High Use Interior Door Hardware:
   a. BHMA 630, satin finished stainless steel.

3. Typical Interior Door Hardware:
   a. BHMA 626, satin chromium plated brass or bronze.

4. Closers:
   a. BHMA 628, satin aluminum, clear anodized.

5. Thresholds:
   a. BHMA 628, satin aluminum, clear anodized.

6. Other Items: Furnish manufacturer's standard finishes to match similar hardware types on same door, and maintain acceptable finish considering anticipated use and BHMA category of finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify doors and frames are ready to receive door hardware and dimensions are as instructed by manufacturer.

C. Verify electric power is available to power operated devices and is of correct characteristics.

3.2 INSTALLATION

A. Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.

B. Mounting Heights From Finished Floor to Center Line of Hardware Item: Comply with manufacturer recommendations and applicable codes where not otherwise indicated.
1. Locksets: 38 inch.
2. Push/Pulls: 42 inch.
3. Dead Locks: 48 inch.
4. Push Pad Type Exit Devices: 42 inch.
5. Cross Bar Type Exit Devices: 38 inch.

6. Top Hinge: Jamb manufacturer's standard, but not greater than 10 inches from head of frame to center line of hinge.
7. Bottom Hinge: Jamb manufacturer's standard, but not greater than 12-1/2 inches from floor to center line of hinge.
8. Intermediate Hinges: Equally spaced between top and bottom hinges and from each other.
9. Hinge Mortise on Door Leaf: 1/4 inch. to 5/16 inch from stop side of door.

3.3 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Adjust hardware for smooth operation.

3.4 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 017000 - Execution and Closeout Requirements: Protecting installed construction.

B. Do not permit adjacent work to damage hardware or hardware finish.

3.5 SCHEDULES

Hardware Set 1:	(exterior, single, egress)
Hinges:	HAG BB1191, 4 1/2" x 4 1/2" x 630, 3 per leaf
Lock:	DAH 9308 x 626
Closer:	DAH 8616 DS FC x Aluminum
Threshold:	NGP 426E x req'd length.
Sweep:	NGP 601
Weather-stripping:	NGP 160VA

Hardware Set 2:	(single, office)
Hinges:	HAG BB1279, 4 1/2" x 4 1/2" x 626, 3 per leaf
Lock:	SCH AL50PD x JUP x 626
Wall Stop:	IVS 409 1/2 x B26D

Hardware Set 3:	(exterior, single, entrance)
Hinges:	HAG BB1191, 4 1/2" x 4 1/2" x 630, 3 per leaf
Lock:	SCH AL53PD x JUP x 626
Closer:	DAH 8616 DS FC x Aluminum
Threshold:	NGP 426E x req'd length.
Sweep:	NGP 601
Weather-stripping:	NGP 160VA

Hardware Set 4:	(single, passage)
Hinges:	HAG BB1279, 4 1/2" x 4 1/2" x 626, 3 per leaf
Lock:	SCH AL10S x JUP x 626
Closer:	DAH 8616 DS FC x Aluminum

Hardware Set 5:	(single, classroom)
Hinges:	HAG BB1279, 4 1/2" x 4 1/2" x 626, 3 per leaf
Lock:	SCH AL70PD x JUP x 626
Wall Stop:	IVS 409 1/2 x B26D

Hardware Set 6:	(exterior, single, storeroom)
Hinges:	HAG BB1191, 4 1/2" x 4 1/2" x 630, 3 per leaf
Lock:	SCH AL80PD x JUP x 626
Closer:	DAH 8616 DS FC x Aluminum
Threshold:	NGP 426E x req'd length.
Sweep:	NGP 601
Weather-stripping:	NGP 160VA

Hardware Set 7:	(single, privacy)
Hinges:	HAG BB1279, 4 1/2" x 4 1/2" x 626, 3 per leaf
Lock:	SCH AL40S x JUP x 626
Closer:	DAH 8616 DS FC x Aluminum

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass glazing for metal frames, doors, windows.
2. Glass glazing materials and installation requirements are included in this section for other sections referencing this section.

B. Related Sections:
1. Section 079000 - Joint Protection: Sealant and back-up material other than glazing sealants.
2. Section 081314 - Standard Steel Doors: Glazed doors.

1.2 REFERENCES

A. American National Standards Institute:

1. ANSI Z97.1 - Safety Glazing Materials Used in Buildings Safety.

B. American Society of Civil Engineers:

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International:

1. ASTM C509 - Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
2. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
3. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
4. ASTM C1036 - Standard Specification for Flat Glass.
5. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
6. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass.
7. ASTM C1193 - Standard Guide for Use of Joint Sealants.
8. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass.
9. ASTM D635 - Standard Test Method for Rate of Burning and Extent and Time of Burning of Plastics in a Horizontal Position.
10. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
11. ASTM D4802 - Standard Specification for Poly (Methyl Methacrylate) Acrylic Plastic Sheet.
12. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
13. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
14. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
15. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings.
16. ASTM E1425 - Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems.

17. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
18. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
19. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

D. Consumer Products Safety Commission:

1. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing.

E. Glass Association of North America:

1. GANA - Sealant Manual.
2. GANA - Glazing Manual.
3. GANA - Laminated Glass Design Guide.

F. National Fenestration Rating Council Incorporated:

1. NFRC 100 - Procedures for Determining Fenestration Product U-Factors.
2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.
3. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems.

1.3 PERFORMANCE REQUIREMENTS

A. Provide glass and glazing materials for continuity of building enclosure vapor retarder and air barrier:

1. In conjunction with materials described in Section 079000.
2. To utilize inner pane of multiple pane sealed units for continuity of air barrier and vapor retarder seal.
3. To maintain continuous air barrier and vapor retarder throughout glazed assembly from glass pane to heel bead of glazing sealant.

B. Glass Thickness: Select minimum thickness in accordance with ASTM E1300 to resist specified design loads with the following maximum probability of breakage:

1. Vertical Glass: 8 lites per 1000 for wind loads with 60 seconds maximum load duration.
2. Minimum Thickness: 1/4 inch (6 mm) for exterior glass.

C. Structural Design: Design in accordance with applicable code for most critical combination of wind, snow, seismic, and dead loads.

D. Wind Loads: Design and size glass to withstand positive and negative wind loads acting normal to plane of wall, including increased loads at building corners.

1. Design Wind Load: As calculated in accordance with applicable code and ASCE 7 with 110 mph basic wind speed.

E. Exterior Glass Deflection: Maximum of 1/175 of glass edge length or 3/4 inch, which ever is less with full recovery of glazing materials.

F. Interior Glass Deflection: Maximum differential deflection for two adjacent unsupported edges when 50 plf force is applied to one panel at any point up to 42 inches above finished floor less than thickness of glass.

G. Thermal and Solar Optical Performance: Measured or calculated in accordance with the following:

1. Maximum U-Values: Comply with ICC IEEC for climate zone in which project is located. Measure in accordance with AAMA 1503.
2. Maximum SHGC: Comply with ICC IEEC for climate zone in which project is located. Measure in accordance with NFRC 200.
3. Solar Optical Properties: NFRC 300.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Product Data:

1. Glass: Provide structural, physical, and thermal and solar optical performance characteristics, size limitations, special handling or installation requirements.
2. Glazing Sealants, Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors where exposed.

C. Manufacturer's Certificate: Certify sealed insulating glass, meets or exceeds specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual for glazing installation methods.

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements.

B. Do not install glazing when ambient temperature is less than 50 degrees F.

C. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.8 WARRANTY

A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish five year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

PART 2 - PRODUCTS

2.1 FLOAT GLASS MATERIALS

A. Annealed Glass: ASTM C1036, Type 1 transparent flat, Quality Q3, float glass.

1. Furnish annealed glass except where heat strengthened or tempered glass is required to meet specified performance requirements.

B. Heat Strengthened Glass: ASTM C1048, Type 1 transparent flat, Quality Q3, Kind HS heat strengthened, Condition A uncoated, float glass.

1. Furnish heat strengthened glass where annealed glass cannot meet specified performance requirements.

C. Tempered Glass: ASTM C1048, Type 1 transparent flat, Quality Q3, Kind FT fully tempered, Condition A uncoated, float glass with horizontal tempering.

1. Furnish tempered glass where heat strengthened glass cannot meet specified performance requirements.
2. Furnish tempered glass conforming to CPSC 16 CFR 1201 Category I at locations where safety glass is required by applicable code.

2.2 FLOAT GLASS PRODUCTS

A. Clear Glass: Tempered float glass as specified; Class 1 clear.
1. Clear tempered glass (SG).
2. Minimum Thickness: 1/4 inch.

2.3 INSULATING GLASS PRODUCTS

A. Insulating Glass: ASTM E2190 certified by Insulating Glass Certification Council; with silicone sealant edge seal; place film within unit; purge interpane space with dry hermetic air.

1. Total Unit Thickness: 1 inch.
2. Insulating Glass Unit Edge Seal Construction: Aluminum, bent and soldered corners.
3. Insulating Glass Unit Edge Seal Material: Polyisobutylene.

B. Double Pane Insulating Glass (IG):

1. Total Unit Thickness: 1 inch.
2. Glass Type: Class 1, low-e, tinted.
3. U-Factor: .3
4. Solar Heat Gain Coefficient: .25 maximum.

2.4 GLAZING SEALANTS

A. Elastomeric Glazing Sealants: Materials compatible with adjacent materials including glass, insulating glass seals, and glazing channels.

1. Silicone Glazing Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component; chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining, cured Shore A hardness of 15 to 25.
   a. Structural Silicone: Furnish high-modulus structural silicone glazing materials where sealant bonds glass to substrate.

B. Dense Gaskets: Resilient extruded shape to suit glazing channel retaining slot; black color.

1. Neoprene: ASTM C864.
2. EPDM: ASTM C864.
3. Silicone: ASTM C1115.

C. Pre-Formed Glazing Tape: Size to suit application.

1. Preformed butyl compound; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.
   a. Butyl Corner Sealant: ASTM C920 single component non-skinning butyl compatible with glazing tape; color to match tape.

2.5 GLAZING ACCESSORIES

A. Setting Blocks: Elastomeric material recommended by glass manufacturer, 80 to 90 Shore A durometer hardness, length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Elastomeric material recommended by glass manufacturer, 50 to 60 Shore A durometer hardness, minimum 3 inch long x one half the height of glazing stop x thickness to suit application.

C. Glazing Clips: Manufacturer's standard type.

D. Plastic Film: Low emissivity film.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify openings for glazing are correctly sized and within acceptable tolerance.

C. Verify surfaces of glazing channels or recesses are clean, free of obstructions impeding 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.

3.3 INSTALLATION

A. Perform installation in accordance with GANA Glazing Manual.

1. Glazing Sealants: Comply with ASTM C1193.

B. Exterior Dry Method (Gasket Glazing):

1. Cut glazing gasket to length; install on glazing pane. Seal corners by butting tape and sealing junctions with compatible butyl sealant.
2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
3. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
4. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.

C. Exterior Wet/Dry Method (Preformed Tape and Sealant) Installation:

1. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with compatible butyl sealant.
2. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapor seal.
3. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
4. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.
5. Fill gap between glazing and stop with elastomeric glazing sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.
6. Apply cap bead of elastomeric glazing sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

D. Exterior Wet Method (Sealant and Sealant) Installation:

1. Place setting blocks at 1/4 points and install glazing pane or unit.
2. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inches intervals, 1/4 inch below sight line.
3. Fill gaps between glazing and stops with elastomeric glazing sealant to depth of bite on glazing, but not more than 3/8 inch below sight line to ensure full contact with glazing and continue the air and vapor seal.
4. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

E. Interior Dry Method (Tape and Tape) Installation:

1. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
2. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
3. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
4. Place glazing tape on free perimeter of glazing in same manner described above.
5. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
6. Knife trim protruding tape.

3.4 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Final cleaning.

B. Remove glazing materials from finish surfaces.

C. Remove labels after Work is complete.

D. Clean glass and adjacent surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 017000 - Execution and Closeout Requirements: Protecting installed construction.

END OF SECTION 088000

DIVISION 9
FINISHES



SECTION 092116 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Shaft wall system.
2. Gypsum board and joint treatment.
3. Acoustic insulation.

B. Related Requirements:
1. Section 061053 - Miscellaneous Rough Carpentry

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
2. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members.
3. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
4. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
5. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
6. 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. to 0.112 in. in Thickness.
7. ASTM C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases.
8. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel.
9. ASTM C1396/C1396M - Standard Specification for Gypsum Board.
10. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
11. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
12. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
13. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

B. American Society of Civil Engineers:

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. Gypsum Association:

1. GA 214 - Recommended Levels of Gypsum Board Finish.
2. GA 216 - Application and Finishing of Gypsum Board.
3. GA 600 - Fire Resistance Design Manual Sound Control.

D. Intertek Testing Services (Warnock Hersey Listed):

1. WH - Certification Listings.

E. National Fire Protection Association:

1. NFPA 265 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Textile Coverings on Full Height Panels and Walls, Method B.
2. NFPA 286 - Standard Methods of Fire Tests for Evaluating Room Fire Growth Contribution of Wall and Ceiling Interior Finish.

F. Underwriters Laboratories Inc.:

1. UL - Fire Resistance Directory.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on metal framing and gypsum board.

C. Shop Drawings:

1. Indicate special details associated with fireproofing.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C840.

B. Fire Rated Wall Construction: Rating as indicated on Drawings.

1. Tested Rating: Determined in accordance with ASTM E119.
2. Fire Rated Partitions: Listed assembly by UL.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Gypsum Board Materials: ASTM C1396/C1396M; Type X fire resistant where indicated on Drawings.

1. Standard Gypsum Board: 5/8 inch thick, maximum available length in place; ends square cut, square edges.
2. Moisture Resistant Gypsum Board: 5/8 inch thick, maximum available length in place; ends square cut, square edges.

3. Gypsum Shaftliner: ASTM C442, 1 inch (25 mm) thick, maximum available size in place; square edges, ends square cut.

2.2 ACCESSORIES

A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced.

B. Gypsum Board Accessories: ASTM C1047; metal; corner beads, edge trim, and expansion joints.

1. Metal Accessories: Galvanized steel.
2. Edge Trim: Type L bead.

C. Joint Materials: ASTM C475/C475M; GA-216; reinforcing tape, joint compound, and water.

D. Gypsum Board Screws: ASTM C954; length to suit application.

1. Screws for Steel Framing: Type S.
2. Screws for Wood Framing: Type W.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify site conditions are ready to receive work and opening dimensions are as instructed by manufacturer.

3.2 INSTALLATION

A. Acoustic Accessories Installation:
1. Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

B. Gypsum Board Installation:

1. Install gypsum board in accordance with ASTM C840, GA-216.
2. Erect single layer gypsum board in most economical direction, with ends and edges occurring over firm bearing.
3. Erect single layer fire rated gypsum board, with edges and ends occurring over firm bearing.
4. Use screws when fastening gypsum board to metal furring or framing.
5. Double Layer Applications: Use gypsum base for first layer, placed perpendicular to framing or furring members.
6. Double Layer Applications: Secure second layer to first with fasteners.
7. Place second layer perpendicular to first layer. Offset joints of second layer from joints of first layer.
8. Treat cut edges and holes in moisture resistant gypsum board with sealant.
9. Place control joints consistent with lines of building spaces as indicated on Drawings.
10. Place corner beads at external corners.Use longest practical length.
11. Place edge trim where gypsum board abuts dissimilar materials.

C. Joint Treatment:

1. Finish in accordance with GA-214 Level 4.
2. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
3. Feather coats on to adjoining surfaces so that camber is maximum 1/32 inch.

3.3 TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Maximum Variation of Finished Gypsum Board Surface from Flat Surface: 1/8 inch in 10 feet.

END OF SECTION 092116

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes metal stud framing and accessories.

B. Related Sections:
1. Section 061053 - Miscellaneous Rough Carpentry: Rough wood blocking within stud framing.

1.2 REFERENCES

A. ASTM International:

1. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members.
4. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
5. ASTM C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases.

B. National Association of Architectural Metal Manufacturers:

1. NAAMM ML/SFA 540 - Lightweight Steel Framing Systems Manual.

C. SSPC: The Society for Protective Coatings:

1. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data describing standard framing member materials and finish, product criteria, load charts, and limitations.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C754.

B. Form, fabricate, install, and connect components in accordance with NAAMM ML/SFA 540.

C. Furnish framing materials in accordance with SSMA - Product Technical Information.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1. Framing Manufacturer: Current member of Steel Stud Manufacturers Association.

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Framing System Components: ASTM C645.

B. Studs: ASTM A653/A653M, non-load bearing rolled steel, channel shaped, punched for utility access, as follows:

1. Depth: as shown on drawings
2. Thickness: 0.03 inch.

C. Tracks and Headers: Same material and thickness as studs, bent leg retainer notched to receive studs.

D. Furring and Bracing Members: Of same material as studs; thickness to suit purpose.

E. Fasteners: ASTM C1002; Type S; length to suit application.

F. Anchorage Devices: Power actuated.

G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20.

2.2 SHOP FINISHING

A. Studs: Galvanize to G90 coating class.

B. Tracks and Headers: Galvanize to G90 coating class.

C. Accessories: Same finish as framing members.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify rough-in utilities are in proper location.

3.2 INSTALLATION

A. Align and secure top and bottom runners at 24 inches oc.

B. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.

C. Install studs vertically at 16 inches oc.

D. Align stud web openings horizontally.

E. Secure studs to tracks using fastener method. Do not weld.

F. Stud splicing not permissible.

G. Fabricate corners using minimum of three studs.

H. Double stud at wall openings, door and window jambs, not more than 2 inches from each side of openings.

I. Brace stud framing system rigid.

J. Coordinate erection of studs with requirements of door frames; install supports and attachments.

K. Coordinate installation of wood bucks, anchors, and wood blocking with electrical and mechanical work to be placed within or behind stud framing.

L. Blocking: Secure wood blocking to studs.

M. Refer to Drawings for indication of partitions extending stud framing through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Install extended leg ceiling runners.

N. Coordinate placement of insulation in stud spaces after stud frame erection.

3.3 ERECTION TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Maximum Variation From Indicated Position: 1/8 inch in 10 feet.

C. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION 092216

SECTION 093000 - TILING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes ceramic tile for floor and wall applications; cementitious backer board as tile substrate; thresholds at door openings; and ceramic accessories.

B. Related Sections:

1. Section 033500 - Concrete Finishing: Troweling of floor slab for tile application.
2. Section 079000 - Joint Protection.

1.2 REFERENCES

A. American National Standards Institute:

1. ANSI A108.1 - Installation of Ceramic Tile, A collection.
2. ANSI A108.1A - Specifications for Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar.
3. ANSI A108.1B - Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.
4. ANSI A108.1C - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar -or- Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.
5. ANSI A108.5 - Specifications for Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
6. ANSI A108.6 - Specifications for Ceramic Tile Installed with Chemical-Resistant, Water-Cleanable Tile-Setting and -Grouting Epoxy.
7. ANSI A108.9 - Specifications for Ceramic Tile Installed with Modified Epoxy Emulsion Mortar/Grout.
8. ANSI A108.10 - Specifications for Installation of Grout in Tilework.
9. ANSI A118.1 - Standard Specification for Dry-Set Portland Cement Mortar.
10. ANSI A118.3 - Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy and Water-Cleanable Tile-Setting Epoxy Adhesive.
11. ANSI A118.4 - Latex-Portland Cement Mortar.
12. ANSI A118.6 - Ceramic Tile Grouts.
13. ANSI A118.8 - Modified Epoxy Emulsion Mortar/Grout.
14. ANSI A118.9 - Test Methods and Specifications for Cementitious Backer Units.
15. ANSI A137.1 - Ceramic Tile.

B. ASTM International:

1. ASTM C847 - Standard Specification for Metal Lath.

C. Scientific Certification Systems:

1. SCS EC10.2 - Environmental Certification Program Indoor Air Quality Performance.

D. Tile Council of America:

1. TCA - Handbook for Ceramic Tile Installation.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit instructions for using grouts.

C. Samples: Submit two samples of tile illustrating pattern, and color variations.

1.4 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with TCA Handbook and ANSI A108 Series/A118 Series.

B. Perform Work in accordance with Municipality standard.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Product storage and handling requirements.

B. Protect adhesives and grouts from freezing or overheating.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements.

B. Do not install adhesives and grouts in unventilated environment.

C. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Ceramic Tile: ANSI A137.1, conforming to the following:

1. Moisture Absorption: 0 to 0.5 percent.
2. Size: indicated on drawings.
3. Shape: Square.
4. Edge: Square.
5. Surface Finish: Unglazed.
6. Color: As selected.

B. Base: Match floor tile for moisture absorption, surface finish, and color:

1. Length: Tile length.
2. Top Edge: Square
3. Internal Corner: Coved.
4. External Corner: Bullnosed.

C. Color: As selected from manufacturer's full range of colors.

2.2 ACCESSORIES

A. Mortar Materials:

1. Mortar Bed Materials: ANSI A108.1A; portland cement, sand, and water; proportioned in accordance with applicable code.
2. Mortar Bond Coat Materials:

a. Dry-Set Portland Cement type: ANSI A118.1.
b. Latex-Portland Cement type: ANSI A118.4.

B. Grout Materials:

1. Standard Grout: Sand-Portland Cement type as specified in ANSI A118.6; use for ceramic tile applications

C. Cementitious Backer Board: ANSI A118.9; High density, cementitious, glass fiber reinforced, 5/8 inch thick; 2 inch wide coated glass fiber tape for joints and corners.

D. Thresholds: Marble, size by full width of frame opening, beveled one side, radiused edges from bevel to vertical face.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify surfaces are ready to receive work.

3.2 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install cementitious backer board. Tape joints and corners, cover with skim coat of mortar to feather edge.

3.3 INSTALLATION

A. Install tile, thresholds, and grout in accordance with applicable requirements of ANSI A108.1 through A108.10, and TCA Handbook recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Place thresholds at exposed tile edges.

D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor, base and wall joints.

E. Place tile with joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

1. Ceramic Tile: 1/8 inch.

F. Form internal angles square and external angles bullnosed.

G. Install ceramic accessories rigidly in prepared openings.

H. Sound tile after setting. Replace hollow sounding units.

I. Keep control joints free of adhesive or grout. Apply sealant to joints.

J. Allow tile to set for a minimum of 48 hours prior to grouting.

K. Grout tile joints. Use standard grout unless otherwise indicated.

L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

M. Installation - Floors - Thin-Set Methods:
1. Over interior concrete substrates, install in accordance with TCA Handbook Method F113, dry-set or latex-portland cement bond coat, with standard grout, unless otherwise indicated.

N. Installation - Wall Tile:
1. Over cementitious backer units install in accordance with TCA Handbook Method W244.

3.4 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Final cleaning.

B. Clean tile and grout surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 017000 - Execution and Closeout Requirements: Protecting installed construction.

B. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION 093000

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Acoustic panels.
2. Suspended metal grid ceiling system and perimeter trim.

B. Related Requirements:
1. Section 079000 - Joint Protection.

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
2. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
3. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
5. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
6. ASTM E580/E580M - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint.
7. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.

B. American Society of Civil Engineers:

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. Ceilings and Interior Systems Construction Association:

1. CISCA - Acoustical Ceilings: Use and Practice.

D. Intertek Testing Services (Warnock Hersey Listed):

1. WH - Certification Listings.

E. National Fire Protection Association:

1. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

F. Underwriters Laboratories Inc.:

1. UL - Fire Resistance Directory.

1.3 SEQUENCING

A. Section 011000 - Summary: Requirements for sequencing.

B. Sequence Work to ensure acoustic 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.

C. Install acoustic units after interior wet work is dry.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on acoustic units.

C. Manufacturer's Instructions: Submit special procedures, and perimeter conditions requiring special attention.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

B. Extra Stock Materials:

1. Furnish 120 sq ft of extra panels to Owner.

1.6 QUALITY ASSURANCE

A. Conform to CISCA requirements.

B. Surface Burning Characteristics: Comply with the following when tested in accordance with NFPA 286.

1. During 40 kW Exposure: No flame spread to ceiling.
2. During 160 kW Exposure: No flame spread to perimeter of tested sample and no flashover.
3. Total Smoke Release: Maximum 1,000 cu m.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

1.8 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Ambient conditions control facilities for product storage and installation.

B. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustic unit installation.

PART 2 - PRODUCTS

2.1 SUSPENDED CEILINGS

A. Manufacturers:
1. Armstrong
2. Certainteed
3. USG

2.2 ACOUSTICAL CEILING COMPONENTS

A. Acoustic Panels (AP-1): ASTM E1264, conforming to the following:

1. Size: 24 x 24 inches.
2. Thickness: 5/8 inches.
3. Composition: Mineral.
4. Light Reflectance: 85 percent.
5. NRC Range: .55
6. Ceiling Attenuation Class: 35
7. Edge: Square.
8. Surface Color: White.
9. Surface Finish: Fine Fissured
10. Acceptable product: Fine Fissured 1713 as manufactured by Armstrong World Industries

B. Acoustic Panels (AP-2): ASTM E1264, conforming to the following:

1. Size: 24 x 24 inches.
2. Thickness: 5/8 inches.
3. Composition: Mineral.
4. Light Reflectance: 85 percent.
5. NRC Range: .55
6. Ceiling Attenuation Class: 35
7. Edge: Square.
8. Surface Color: White.
9. Surface Finish: Course
10. Acceptable product: Armatuff as manufactured by Armstrong World Industries

C. Grid:

1. Non-fire Rated Grid: ASTM C635, intermediate duty; exposed T; components die cut and interlocking.
2. Grid Materials: Extruded aluminum.
3. Exposed Grid Surface Width: 15/16 inch.
4. Perimeter Molding Width: Match grid width.
5. Grid Finish: White
6. Accessories: Clips, splices, perimeter moldings, and hold down clips required for suspended grid system.
7. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.

2.3 ACCESSORIES

A. Touch-up Paint: Type and color to match acoustic and grid units.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify layout of hangers will not interfere with other work.

3.2 DEMOLITION

A. Extend existing acoustical ceiling installations using materials and methods as specified.

B. Clean and repair existing acoustical ceilings which remain or are to be reinstalled.

3.3 INSTALLATION

A. Lay-In Grid Suspension System:

1. Install suspension system in accordance with ASTM C635, ASTM C636 and as supplemented in this section.
2. Install system capable of supporting imposed loads with maximum deflection of 1/360 maximum.
3. Lay out system to balanced grid design with edge units no less than 50 percent of acoustic unit size.
4. Locate system on room axis according to reflected plan.
5. Install after major above ceiling work is complete. Coordinate location of hangers with other work.
6. Install hanger clips during steel deck erection. Install additional hangers and inserts as required.
7. 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.
8. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.
9. Do not support components on main runners or cross runners when weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.
10. Do not eccentrically load system, or produce rotation of runners.
11. Perimeter Molding:

    a. Install edge molding at intersection of ceiling and vertical surfaces.
    b. Use longest practical lengths.
    c. Overlap and rivet corners.
    d. Install at junctions with other interruptions.

B. Acoustic Units:

1. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.

2. Lay directional patterned units one way with pattern parallel to longest. Fit border trim neatly against abutting surfaces.
3. Install units after above ceiling work is complete.
4. Install acoustic units level, in uniform plane, and free from twist, warp, and dents.
5. Cutting Acoustic Units:

    a. Cut to fit irregular grid and perimeter edge trim.
    b. Cut edges to field cut units.
6. Install hold-down clips to retain panels tight to grid system within 20 ft of exterior door.

3.4 TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

C. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION 095113

SECTION 096500 - RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes resilient tile flooring and resilient base.

1.2 REFERENCES

A. ASTM International:

1. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile.
2. ASTM F1861 - Standard Specification for Resilient Wall Base.

B. Federal Specification Unit:

1. FS L-F-475 - Floor Covering Vinyl, Surface (Tile and Roll), with Backing.

C. National Fire Protection Association:

1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.

D. Scientific Certification Systems:

1. SCS EC10.2 - Environmental Certification Program Indoor Air Quality Performance.

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate seaming plan, custom patterns and inlay designs.

C. Product Data: Submit data describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

D. Samples:

1. Submit manufacturer's complete set of color samples for initial selection.
2. Submit samples, illustrating color and pattern for each resilient flooring product specified.

1.4 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.5 QUALITY ASSURANCE

A. Surface Burning Characteristics:

1. Floor Finishes: Class I, minimum 0.45 watts/sq cm when tested in accordance with NFPA 253.
2. Base Material: Class I, minimum 0.45 watts/sq cm when tested in accordance with NFPA 253.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements.

B. Maintain temperature in storage area between 55 degrees F and 90 degrees F.

C. Store materials for not less than 48 hours prior to installation in area of installation at temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

1.8 EXTRA MATERIALS

A. Section 017000 - Execution and Closeout Requirements: Spare parts and maintenance products.

B. Furnish 100 sq ft of flooring, of each type and color specified.

PART 2 - PRODUCTS

2.1 TILE FLOORING

A. Manufacturers:

1. Armstrong, Standard Excelon
2. Tarkett, VCT
3. Or equal
4. Substitutions: Section 016000 - Product Requirements.

B. Vinyl Composition Tile: ASTM F1066:

1. Size: 12 x 12 inch.
2. Thickness: 0.125 inch.
3. Pattern: Through pattern.

2.2 RESILIENT BASE

A. Base: ASTM F1861 Type TV - Vinyl; coved style:

1. Height: 4 inch.
2. Thickness: 0.080 inch thick.
3. Finish: Gloss.
4. Length: Roll.
5. Accessories: Premolded external corners and internal corners.

2.3 ACCESSORIES

A. Subfloor Filler: Cementitious; type recommended by adhesive material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Moldings and Edge Strips: Metal.

D. Sealer and Polish: Types recommended by flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify concrete floors are dry to maximum moisture content as recommended by manufacturer, and exhibit negative alkalinity, carbonization, and dusting.

C. Verify floor and lower wall surfaces are free of substances capable of impairing adhesion of new adhesive and finish materials.

3.2 PREPARATION

A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

B. Prohibit traffic until filler is cured.

C. Clean substrate.

D. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances cannot be removed.

3.3 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed.

B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

C. Install tile to quarter turn pattern. Allow minimum 1/2 full size tile width at room or area perimeter.

D. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

E. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.

F. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.

3.4 INSTALLATION - BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Miter internal corners. At external corners, use premolded units. 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. Section 017000 - Execution and Closeout Requirements: Final cleaning.

B. Remove all loose dust, dirt, and debris.

C. Remove excess adhesive from floor, base, and wall surfaces without damage.

D. Damp mop floor with property diluted neutral detergent solution.

E. Apply stain resistant sealer before apply floor polish.

F. Apply a minimum of 2 coats of commercial floor polish.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Section 017000 - Execution and Closeout Requirements: Protecting installed construction.

B. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION 096500

SECTION 09 7720 – FIBERGLASS REINFORCED WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Prefinished polyester glass reinforced plastic sheets and adhered to unfinished gypsum wallboard and masonry.
1. PVC trim
2. Stainless Steel Corner Guard

1.2 REFERENCES

A. American Society for Testing and Materials: Standard Specifications (ASTM)
1. ASTM D 256 - Izod Impact Strengths (ft #/in)
2. ASTM D 570 - Water Absorption (%)
3. ASTM D 638 - Tensile Strengths (psi) & Tensile Modulus (psi)
4. ASTM D 790 - Flexural Strengths (psi) & Flexural Modulus (psi)
5. ASTM D 2583- Barcol Hardness
6. ASTM D 5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

A. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

B. Selection Samples: Submit manufacturer's standard color pattern selection samples representing manufacturer's full range of available colors and patterns.

C. Samples for Verification: Submit appropriate section of panel for each finish selected indicating the color, texture, and pattern required.
1. Submit complete with specified applied finish.
2. For selected patterns show complete pattern repeat.
3. Exposed Molding and Trim: Provide samples of each type, finish, and color.

1.4 QUALITY ASSURANCE

A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
1. ASTM E 84 (Method of test for surface burning characteristics of building Materials)
a. Wall Required Rating – Class A.

B. Sanitary Standards: System components and finishes to comply with:
1. United States Department of Agriculture (USDA) requirements for food preparation facilities, incidental contact.
2. Food and Drug Administration (FDA) 1999 Food Code 6-101.11.

3. Canadian Food Inspection Agency (CFIA) requirements.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials factory packaged on strong pallets.

B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (70°) for 48 hours prior to installation.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Building are to be fully enclosed prior to installation with sufficient heat (70°) and ventilation consistent with good working conditions for finish work

B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
1. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

1.7 WARRANTY

A. Furnish one year guarantee against defects in material and workmanship.

PART 2 - PRODUCTS

2.1 FIBERGLASS REINFORCED PANELS

A. Manufacture:
1. Marlite Company
2. Krane Composites
3. Kemlite Company
4. Substitutions: Permited

2.2 STANDARD PANELS

A. Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319.
1. Coating: Multi-layer print, primer and finish coats or applied over-layer.
2. Dimensions:
   a. Thickness – 0.090 " nominal
   b. Width - 4'-0" nominal
   c. Length – 10'-0" nominal
3. Tolerance:
   a. Length and Width: +/-1/8 "
   b. Square - Not to exceed 1/8 " for 8 foot panels or 5/32 " for 10 foot panels

B. Properties: Resistant to rot, corrosion, staining, denting, peeling, and splintering.
1. Flexural Strength - 1.0×10^4 psi per ASTM D 790.
2. Flexural Modulus - 3.1×10^5 psi per ASTM D 790.
3. Tensile Strength - 7.0×10^3 psi per ASTM D 638.
4. Tensile Modulus - 1.6×10^5 psi per ASTM D 638.
5. Water Absorption - 0.72% per ASTM D 570.
6. Barcol Hardness (scratch resistance) of 35 55 as per ASTM D 2583.
7. Izod Impact Strength of 72 ft. lbs./in ASTM D 256

C. Back Surface: Smooth. Imperfections which do not affect functional properties are not cause for rejection.

D. Front Finish: Pebbled, Class A, Color to be selected from manufactures standard colors

E. PVC Trim: Thin-wall semi-rigid extruded PVC.
1. M 350 Inside Corner
2. M 365 Division
3. M 370 Edge
4. Color: To match panel

F. Outside Corner Guard:
1. F 560SS Stainless corner guard, #4 brushed satin, full length

2.3 ACCESSORIES

A. Fasteners: Non-staining nylon drive rivets.
1. Match panel colors.
2. Length to suit project conditions.

B. Adhesive: Water-resistant, non flammable construction adhesives complying with ASTM C 557.

C. Sealant: Silicone Sealant to match panel.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.
1. Verify that stud spacing does not exceed 24" (61cm) on-center.

B. Repair defects prior to installation.
1. Level wall surfaces to panel manufacturer's requirements. Remove protrusions and fill indentations.

3.2 INSTALLATION

A. Comply with manufacturer's recommended procedures and installation sequence.

B. Cut sheets to meet supports allowing 1/8" (3 mm) clearance for every 8 foot (2.4m) of panel.
1. Cut and drill with carbide tipped saw blades or drill bits, or cut with shears.
2. Pre-drill fastener holes 1/8" (3mm) oversize with high speed drill bit.
   a. Space at 8" (200mm) maximum on center at perimeter, approximately 1" from panel edge.
   b. Space at in field in rows 16' (40.64cm) on center, with fasteners spaced at 12" (30.48 cm) maximum on center.

C. Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels.
1. Install panels with manufacturer's recommended gap for panel field and corner joints.
   a. Adhesive trowel and application method to conform to adhesive manufacturer's recommendations.
   b. Drive fasteners for snug fit. Do not over-tighten.

D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
   1. All moldings must provide for a minimum 1/8 "(3mm) of panel expansion at joints and edges, to insure proper installation.
   2. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

3.3 CLEANING

A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.

B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION 097720

SECTION 099000 - PAINTING AND COATING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Surface preparation and field application of paints, stains, varnishes, and other coatings.

1.2 DEFINITIONS

A. Refer to ASTM D16 for definitions of terms used in this Section.

1.3 REFERENCE STANDARDS

A. ASTM International:

1. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. Master Painters Institute:

1. MPI - Approved Products List.
2. MPI - Architectural Painting Manual.

1.4 SEQUENCING

A. Section 011000 - Summary: Requirements for sequencing.

B. Do not apply finish coats until paintable sealant is applied.

C. Back prime wood trim before installation of trim.

1.5 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data:

1. Submit manufacturer data on finishing products
2. Include MPI - Approved Products Lists with proposed products highlighted.

C. Samples:

1. Submit paper chip samples, illustrating range of colors available for each surface finishing product as scheduled.

D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer Instructions: Submit special surface preparation procedures, and substrate conditions requiring special attention.

F. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

G. Qualifications Statements:

1. Submit qualifications for manufacturer and applicator.
2. Submit manufacturer's approval of applicator.

1.6 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

B. Operation and Maintenance Data: Submit information on cleaning, touchup, and repair of painted and coated surfaces.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

B. Extra Stock Materials:

1. Furnish 1 gal. of each color and type as provided for Project.
2. Label each container with manufacturer's label, color and type.
3. Store where directed by Owner.

1.8 QUALITY ASSURANCE

A. MPI Standards:

1. Comply with indicated MPI standards.
2. Products: Listed in MPI - Approved Products List.

B. Surface Burning Characteristics:

1. Fire-Retardant Finishes: Maximum 25/450 flame-spread/smoke-developed index when tested according to ASTM E84.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

B. Applicator: Company specializing in performing Work of this Section with minimum three years' experience.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Container Labeling: 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. Inspection:

1. Accept materials on Site in manufacturer's sealed and labeled containers.
2. Inspect for damage and to verify acceptability.

D. Store materials in ventilated area and otherwise according to manufacturer instructions.

E. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.11 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Storage Conditions:

1. Minimum Ambient Temperature: 45 degrees F
2. Maximum Ambient Temperature: 90 degrees F

C. Application Conditions:

1. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint manufacturer.
2. Do not apply exterior coatings during rain or snow, when relative humidity is outside humidity ranges, or when moisture content of surfaces exceeds those required by paint manufacturer.
3. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors and 50 degrees F for exteriors, unless otherwise indicated by manufacturer instructions.
4. Lighting Level: 80 fc, measured mid-height at substrate surface.

1.12 WARRANTY

A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.

B. Furnish five-year manufacturer's warranty for paint and coatings.

PART 2 - PRODUCTS

2.1 PAINTS AND COATINGS

A. Manufacturers:
1. Sherwin Williams
2. PPG
3. Benjamin Moore

B. Materials:

1. Coatings:

a. Ready mixed, except field-catalyzed coatings.
b. Capable of drying or curing free of streaks or sags.

2. Patching Materials: Latex filler.
3. Fastener Head Cover Materials: Latex filler.
4. Accessories:

a. Grade: Commercial.
b. Linseed oil.
c. Shellac.
d. Turpentine.
e. Paint thinners.
f. Other materials not specifically indicated but required to achieve specified finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application examination.

B. Verify that surfaces are ready to receive Work as recommended by product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of Work, and report conditions capable of affecting proper application to Architect/Engineer.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Moisture Content:

1. Measure moisture content of surfaces using electronic moisture meter.
2. Do not apply finishes unless moisture content of surfaces are below following maximums:

a. Plaster and Gypsum Wallboard: 12 percent.
b. Interior Wood: 15 percent, measured according to ASTM D4442.
c. Concrete Floors: 8 percent.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for application preparation.

B. Prepare coatings as follows:

1. To soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.
2. For smooth flow and brushing properties.

C. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

D. Defects:

1. Correct defects and clean surfaces capable of affecting Work of this Section.
2. Remove or repair existing coatings exhibiting surface defects.

E. Marks: Seal marks that may bleed through surface finishes with shellac.

F. Impervious Surfaces:

1. Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach.
2. Rinse with clean water and allow surface to dry.

G. Gypsum Board Surfaces:

1. Fill minor defects with filler compound.
2. Spot-prime defects after repair.

H. Galvanized Surfaces:

1. Remove surface contamination and oils, and wash with solvent.
2. Apply coat of etching primer.

I. Uncoated Steel and Iron Surfaces:

1. Remove grease, mill scale, weld splatter, dirt, and rust.
2. If heavy coatings of scale are evident, remove by [hand] [power tool] wire brushing or by sandblasting.
3. Clean by washing with solvent.
4. Apply treatment of phosphoric acid solution, ensuring that weld joints, bolts, and nuts are similarly cleaned.
5. Spot-prime paint after repairs.

J. Shop-Primed Steel Surfaces:

1. Sand and scrape to remove loose primer and rust.
2. Feather edges to make touch-up patches inconspicuous.
3. Clean surfaces with solvent.
4. Prime bare steel surfaces.

K. Interior Wood Items Scheduled to Receive Paint Finish:

1. Wipe off dust and grit prior to priming.

2. Seal knots, pitch streaks, and sappy sections with sealer.
3. Fill nail holes and cracks after primer has dried.
4. Sand between coats.

L. Metal Doors Scheduled for Painting: Prime metal door at top and bottom edge surfaces.

3.3 APPLICATION

A. Comply with MPI - Architectural Painting Manual.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform appearance.

D. Apply each coat of paint slightly darker than preceding coat, unless specified otherwise.

E. Sand wood and metal surfaces lightly between coats to achieve required finish.

F. Cleaning:

1. Vacuum surfaces to remove loose particles.
2. Use tack cloth to remove dust and particles just prior to applying next coat.

G. Fillers:

1. If clear finishes are required, tint fillers to match wood.
2. Work fillers into grain before set, and wipe excess from surface.

H. Concealed Surfaces:

1. Prime concealed surfaces of interior and exterior woodwork with primer paint.
2. Prime concealed surfaces of interior wood surfaces scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with thinner.

I. Finishing Mechanical and Electrical Equipment:

1. Schedule of Color-Coding and Identification Banding of Equipment, Ductwork, Piping, and Conduit: As specified in those Sections.
2. Paint shop-primed equipment.
3. Paint shop-finished items installed in interior areas.
4. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components, and paint separately.
5. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, and except where these items are shop finished.
6. Paint interior surfaces of air ducts visible through grilles and louvers with one coat of flat black paint to visible surfaces.
7. Paint dampers exposed behind louvers, grilles, to match face panels.
8. Paint exposed conduit and electrical equipment installed in finished areas.
9. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
10. Color-Coding:

    a. Color-code equipment, piping, conduit, and exposed duct work according to indicated requirements.

b. Color band and identify with flow arrows, names, and numbering.

11. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings that were removed prior to finishing.

3.4 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Collect waste material that may constitute fire hazards, place in closed metal containers, and remove daily from Site.

3.5 ATTACHMENTS

A. Schedule - Exterior Surfaces:

1. Steel - Unprimed:

a. Water-Based Light Industrial Coating System MPI EXT 5.1M:

1) Prime Coat: Primer, rust-inhibitive, water based, MPI #107.
2) Intermediate Coat: Matching topcoat.
3) Topcoat: Light industrial coating, exterior, water based, semigloss (MPI Gloss Level 5), MPI #163.

2. Steel - Shop Primed:

a. Touch up shope primer with zinc chromate primer.
b. Field prime coat: Primer, rust-inhibitive, water based, MPI #107.
c. Two coats of latex enamel, semigloss.

3. Steel - Galvanized:

a. One coat galvanize primer.
b. Two coats of latex enamel, semigloss.

B. Schedule - Interior Surfaces:

1. Wood - Painted:

a. One coat of latex prime sealer.
b. Two coats of latex enamel, semigloss.

2. Steel - Unprimed:

a. One coat of latex primer.
b. Two coats of latex enamel, semigloss.

3. Steel – Shop Primed:

a. Field prime coat: One coat of latex primer.
b. Two coats of latex enamel, semigloss.

4. Steel - Galvanized:

    a. One coat galvanize primer.
    b. Two coats of latex enamel, semigloss.

5. Gypsum Board and Plaster Walls:

    a. One coat of alkyd primer sealer.
    b. Two coats of latex enamel, eggshell.

6. Gypsum Board and Plaster Ceilings:

    a. One coat of alkyd primer sealer.
    b. Two coats latex enamel, flat.

END OF SECTION 099000

DIVISION 10
SPECIALTIES



SECTION 101400 - SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes interior signs.

1.2 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate sign styles, lettering font, foreground and background colors, locations, overall dimensions of each sign.

C. Samples: Submit samples illustrating type, style, letter font, and colors specified; method of attachment.

D. Manufacturer's Installation Instructions: Submit installation template and attachment devices.

1.3 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years experience.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Product storage and handling requirements.

B. Package signs, labeled in name groups.

C. Store adhesive attachment tape at ambient room temperatures.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Section 016000 - Product Requirements: Environmental conditions affecting products on site.

B. Do not install signs when ambient temperature is lower than recommended by manufacturer.

C. Maintain this minimum temperature during and after installation of signs.

PART 2 - PRODUCTS

2.1 INTERIOR SIGNS

A. Manufacturers:
   1. Best Sign Systems

2. Inpro
3. Independent Specialty Signage

B. Raised Letter Signs, Base Material: Solid color acrylic plastic:

1. Total Thickness: 1/8 inch.
2. Height: Minimum 6 inches.
3. Width: Minimum 6 inches.
4. Edges: Square.
5. Character Font: Helvetica.

2.2 ACCESSORIES

A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

3.2 INSTALLATION

A. Install signs after surfaces are finished, in locations indicated on Drawings.

B. Position the center of the sign 54 inches aff and 9 inches off of the frame on the strike side of door; level.

END OF SECTION 101400

SECTION 102113.19 - PLASTIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid plastic toilet compartments.
2. Urinal screens.

B. Related Requirements:
1. Section 061000 - Rough Carpentry: Concealed wood framing and blocking for compartment support.
2. Section 102800 - Toilet, Bath, and Laundry Accessories: Execution requirements for accessories specified in this Section.

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM A666 - Standard Specification for Annealed or Cold Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with placement of support framing and anchors in wall.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on panel construction, hardware, and accessories.

C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall and floor supports, door swings.

D. Samples: Submit two compartment samples, illustrating panel finish, color, and sheen.

E. Manufacturer's Instructions: Submit special procedures, and perimeter conditions requiring special attention.

F. Qualifications Statements:

1. Submit qualifications for manufacturer and installer.
2. Submit manufacturer's approval of installer.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

B. Spare Parts:

1. Furnish one set of manufacturer's recommended spare parts.

C. Tools: Furnish special wrenches and other devices required for Owner to maintain panels and hardware.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

B. Installer: Company specializing in performing Work of this Section with minimum three years' experience.

1.7 EXISTING CONDITIONS

A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 SOLID PLASTIC TOILET COMPARTMENTS

A. Manufacturers:
1. Scranton Products
2. American Specialties
3. Bradley

B. Compartments and Screens: Floor mounted, head-rail braced.

C. Door and Panel Dimensions:

1. Thickness: 1 in.
2. Door Width: 24 in.
3. Accessible Door Width: 36 in, out-swinging.
4. Height: 58 in.

D. Pilaster Dimensions:

1. Thickness: 1 in.
2. Width as required to suit compartment width and spacing.

E. Urinal Screens:
1. Wall mounted and cantilevered with continuous extruded, clear-anodized aluminum (6063-T5 alloy) bracket full height of screen.
2. Width: As indicated on Drawings.
3. Height: 42 in.

2.2 MATERIALS

A. Toilet Compartments: Solid, molded thermoset, and waterproof; high-density polyethylene (HDPE) plastic panels, doors, and pilasters,

1. Color: Single color, as selected.

2.3 ACCESSORIES

A. Pilaster Shoe:

1. Formed ASTM A666 Type 304 stainless steel with No. 4 finish, 3 in height to conceal floor fastenings.
2. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.

B. Head Rails: Hollow stainless steel tube, 1 x 1-5/8 in size, with anti-grip profiles, cast socket wall brackets, and integral shower curtain track.

C. Brackets: 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. Hardware: Stainless steel.

1. Pivot hinges, gravity type, adjustable for door-close positioning; two for each door.
2. Nylon bearings.
3. Thumbturn 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 for each compartment, mounted on door.
6. Door pull for out-swinging doors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Requirements for installation examination.

B. Verify field measurements are as indicated on Shop Drawings.

C. Verify correct spacing of and between plumbing fixtures.

D. Verify correct location of built-in framing, anchorage, and bracing.

3.2 INSTALLATION

A. Maintain maximum of 1/2 in space between wall and panels and between wall and end pilasters.

B. Attach panel brackets securely to walls using anchor devices.

C. Attach panels and pilasters to brackets. Locate head-rail joints at pilaster center lines.

3.3 TOLERANCES

A. Section 014000 - Quality Requirements: Requirements for tolerances.

B. Maximum Variation from Indicated Position: 1/4 in.

C. Maximum Variation from Plumb: 1/8 in.

3.4 FIELD QUALITY CONTROL

A. Section 017000 - Execution and Closeout Requirements: Requirements for testing, adjusting, and balancing.

B. Review proposed field touch-up of scratches or damaged finish with Architect prior to initiating repair. Where conditionally approved, use manufacturer-provided repair materials and procedures. Replace all unacceptable field-repaired finishes with new materials.

3.5 ADJUSTING

A. Section 017000 - Execution and Closeout Requirements: Requirements for starting and adjusting.

B. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 in.

C. Adjust hinges to position doors in partially open position when unlatched. Return out-swinging doors to closed position.

D. Adjust adjacent components for consistency of line or plane.

3.6 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Clean partition and screen surfaces with materials and cleansers according to manufacturer's recommendations.

END OF SECTION 102113.19

SECTION 102600 - WALL AND DOOR PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes corner guards.

B. Related Sections:
1. Section 061053 - Miscellaneous Rough Carpentry: Support blocking for wall and corner guard anchors.

1.2 REFERENCES

A. Forest Stewardship Council:

1. FSC Guidelines - Forest Stewardship Council Guidelines.

1.3 PERFORMANCE REQUIREMENTS

A. Corner Guards: Resist lateral impact force of 100 lbs at any point without damage or permanent set.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit physical dimensions, features, anchorage details, and rough-in measurements.

C. Samples: Submit samples, illustrating component design, configuration, color and finish.

D. Manufacturer's Installation Instructions: Submit procedures, perimeter conditions requiring special attention.

1.5 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.6 COORDINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Coordinate Work with wall or partition sections for installation of concealed blocking or anchor devices.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Manufacturers:
1. Inpro
2. C-S Group
3. American Specialties

B. Corner Guard - Surface Mounted:

1. Material: High impact vinyl extruded aluminum full height retainer.
2. Length: One piece.
3. Preformed end caps.

C. Mounting Brackets and Attachment Hardware: Appropriate to component and substrate.

2.2 FABRICATION

A. Fabricate components with tight joints, corners and seams.

B. Pre-drill holes for attachment.

C. Form end trim closure by capping and finishing smooth.

2.3 FACTORY FINISHING

A. Corner Guard: PVC, color selected from manufacturer's standard.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify rough-in for components are correctly sized and located.

3.2 INSTALLATION

A. Position corner guard from top of base to 7'-6" high.

3.3 ERECTION TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

END OF SECTION 102600

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Toilet accessories.

B. Related Requirements:

1. Section 061000 - Rough Carpentry: Concealed wood framing and blocking for support of accessories.

1.2 REFERENCE STANDARDS

A. ASTM International:

1. ASTM A123 - Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
2. ASTM A153 - Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
3. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
4. ASTM A653 - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
5. ASTM A666 - Standard Specification for Annealed or Cold Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
6. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
7. ASTM C1036 - Standard Specification for Flat Glass.

B. South Coast Air Quality Management District:

1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

1.3 COORDINATION

A. Section 013000 - Administrative Requirements: Requirements for coordination.

B. Coordinate Work of this Section with placement of internal wall reinforcement to receive anchor attachments.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures Requirements for submittals.

B. Product Data: Submit data on accessories, describing size, finish, details of function, and attachment methods.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

B. Installer: Company specializing in performing Work of this Section with minimum three years' experience.

PART 2 - PRODUCTS

2.1 TOILET AND BATH ACCESSORIES

A. Manufacturers:
1. American Specialties
2. Bobrick
3. Bradley

B. Performance and Design Criteria:

C. Design grab bars and attachments to resist minimum 250 lb concentrated load applied at any point in any direction.

2.2 MATERIALS

A. Accessories: Shop assembled, free of dents and scratches, and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.

1. Grind weld joints smooth.
2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.

B. Keys: Furnish two keys for each keyed accessory to Owner.

C. Stainless Steel Sheet: ASTM A666, Type 304.

D. Stainless Steel Tubing: ASTM A269, Type 304 stainless steel.

E. Galvanized Sheet Steel: ASTM A653, G90 zinc coating.

F. Mirror Glass (Type MR-F): ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality Q1 mirror select; type with copper and silver coating, and organic overcoating.

G. Adhesive: Contact type, waterproof.

H. Fasteners, Screws, and Bolts: Hot-dip galvanized.

I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

J. Primer: Manufacturer's standard

2.3 FINISHES

A. Stainless Steel: No. 4 satin brushed finish.

B. Chrome/Nickel Plating: ASTM B456, Type SC 2, satin finish.

C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy-electrostatic-baked enamel.

D. Galvanizing: ASTM A123; hot-dip galvanize after fabrication.

E. Galvanizing for Nuts, Bolts, and Washers: ASTM A153.

F. Shop-Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.

G. Back paint components where contact is made with building finishes to prevent electrolysis.

2.4 TOILET ROOM ACCESSORIES

A. Types of accessories required are listed in schedule located on Drawings.

B. Manufacturer's name or model numbers as listed serve as a basis of design for product features, functions, and general appearance.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Requirements for installation examination.

B. Verify exact location of accessories for installation.

C. Verify field measurements and rough-in dimensions for recessed accessories are as instructed by manufacturer.

D. Comply with manufacturer for installation of blocking, reinforcing plates, and concealed anchors in walls.

3.2 PREPARATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Deliver inserts and rough-in frames to Site for timely installation.

C. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

A. Do not install accessories until after completion of all finishes to adjacent wall and ceiling surfaces.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Turn over to Owner all keys and special tools required for lockable or secured accessories.

D. Mounting Heights and Locations: As required by accessibility regulations and as indicated on Drawings:

3.4 REPAIR

A. Clean and repair existing toilet accessories that remain or are to be reinstalled.

3.5 CLEANING

A. Section 017000 - Execution and Closeout Requirements: Requirements for cleaning.

B. Clean mirrors and exposed surfaces using procedures as recommended by accessory manufacturer

END OF SECTION 102800

SECTION 104400 - FIRE PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire extinguishers.
2. Fire extinguisher cabinets.
3. Brackets for wall mounting.

1.2 DEFINITIONS

A. ADA: Americans with Disabilities Act.

1.3 REFERENCE STANDARDS

A. ASTM International:

1. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems.

B. National Fire Protection Association:

1. NFPA 10 - Standard for Portable Fire Extinguishers.

C. UL:

1. UL - Fire Protection Equipment Directory.

1.4 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit extinguisher classifications, operational features, color and finish, and anchorage details.

C. Shop Drawings:

1. Submit reduced scale building plan showing locations of each type of fire protection specialty required.
2. Indicate cabinet physical dimensions, location, rough in measurements for recessed cabinets, wall bracket mounted measurements, and fire ratings.

D. Manufacturer's Instructions: Submit special criteria and wall opening coordination requirements.

1.5 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for closeout procedures.

B. Operation and Maintenance Data:

1. Submit test, refill, or recharge schedules.
2. Submit recertification requirements.

1.6 QUALITY ASSURANCE

A. Comply with NFPA 10.

B. Provide extinguishers classified and labeled by UL for indicated purposes.

C. Provide fire extinguisher cabinets classified and labeled by UL for indicated purpose.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Inspection: Accept materials on Site and inspect for damage.

C. Store and protect materials according to manufacturer's instructions.

1.9 AMBIENT CONDITIONS

A. Section 015000 - Temporary Facilities and Controls: Requirements for ambient condition control facilities for product storage and installation.

B. Do not install extinguishers when ambient temperature is capable of freezing extinguisher contents.

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHERS

A. Multi-Purpose Dry Chemical Type (FEC):

1. Tank: Cast steel.
2. Furnish pressure gage.
3. Class: 2A-10BC.
4. Mount in cabinet

B. Finishes:
   1. Steel: Enamel to red color.
   2. Stainless Steel: Satin chrome.

2.2 FIRE EXTINGUISHER CABINETS

A. Type: Fire-rated.

B. Metal: Formed aluminum

C. Configuration: Semi-recessed, size to accommodate accessories

D. Trim Type: Flat

E. Door:

   1. Thickness: 0.016 inch.
   2. Reinforced for flatness and rigidity.
   3. Door Glazing:

      a. Type: Clear.
      b. Glass Type: Tempered.
      c. Thickness: 1/8.
      d. Design: Vertical duo.

2.3 FABRICATION

A. Form cabinet enclosure with right angle inside corners and seams.

B. Form perimeter trim and door frame.

C. Pre-drill for anchors.

D. Doors:

   1. Hinge doors for 180-degree opening with continuous piano hinge.
   2. Furnish nylon catch.
   3. Glaze doors with resilient channel gasket glazing.

E. Weld, fill, and grind components smooth.

2.4 FINISHES

A. Cabinet Exterior Trim and Door: Anodized aluminum to color selected from manufacturer's standard.

B. Cabinet Interior: Baked enamel to color white.

2.5 ACCESSORIES

A. Cabinet Latch: Friction type, with manufacturer's standard style tubular pull.

B. Extinguisher Brackets: Formed steel, galvanized

C. Cabinet Graphic Identification: Decal

D. Cabinet Mounting Hardware: Manufacturer's standard appropriate to cabinet and substrate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 017000 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify that rough openings for cabinet are correctly sized and located.

3.2 INSTALLATION

A. Install cabinets plumb and level.

B. Install cabinets maximum 48 inches from finished floor to top of extinguisher handle.

C. Secure cabinets rigidly in place.

D. Place extinguishers in cabinets or on wall brackets.

END OF SECTION 104400

DIVISION 13
SPECIAL CONSTRUCTION



SECTION 133419 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes pre-engineered, shop fabricated structural steel building frame; metal wall and sloped roof system including gutters and downspouts.

B. Related Sections:

1. Section 031000 - Concrete Forming and Accessories.
2. Section 079000 - Joint Protection.
3. Section 099000 - Painting and Coating: Finish painting of exterior primed steel surfaces

1.2 REFERENCES

A. American Institute of Steel Construction:

1. AISC S335 - Specification for Structural Steel Buildings Allowable Stress Design, and Plastic Design.
2. AISC S342L - Load and Resistance Factor Design Specification for Structural Steel Buildings.
3. AISC S344L - Metric Load and Resistance Factor Design Specification for Structural Steel Buildings.

B. ASTM International:

1. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
2. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
3. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
4. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
5. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
6. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
7. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
9. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
10. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
11. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.
12. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.

C. American Welding Society:

1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.

D. Metal Building Manufacturers Association:

1. MBMA - Low Rise Building Systems Manual.

E. SSPC: The Society for Protective Coatings:

1. SSPC - Steel Structures Painting Manual.
2. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

F. Underwriters Laboratories Inc.:

1. UL - Building Materials Directory.

G. U.S. Environmental Protection Agency:

1. ENERGY STAR - ENERGY STAR Voluntary Labeling Program.

1.3 SYSTEM DESCRIPTION

A. Single and multi-span rigid frame with tapered beam and column.

B. Bay Spacing: See drawings

C. Primary Framing: Rigid frame of rafter beams and columns, intermediate columns, end wall columns, and portal frame wind bracing.

D. Secondary Framing: Purlins, girts, eave struts, flange bracing, sill supports, clips, and other items detailed.

E. Wall System: Preformed metal panels of vertical profile, with insulation at select locations, and accessory components.

F. Roof System: Preformed metal panels of upslope profile, insulation at select locations, and accessory components.

G. Roof Slopes: 1.5 inches in 12 inches

1.4 DESIGN REQUIREMENTS

A. Thermal resistance of Installed Wall System: R-25+R-10.

B. Thermal Resistance of Installed Roof System: R-25+R-10.

C. Design members to withstand dead load, applicable snow load, and design loads due to pressure and suction of wind calculated in accordance with applicable code.

D. Design members to withstand UL 580 - Uplift Resistance, Uplift Class 90.

E. Design members to support mechanical equipment, electrical equipment, and sprinkler system piping with a minimum collateral load of 10 psf. This does not include load of roofing, insulation, or HVAC units which should be calculated separately.

F. Maximum allowable deflection: 1/180 of span with imposed loads for exterior wall and roof system.

G. Provide drainage to exterior for water entering or condensation occurring within wall or roof system.

H. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.

I. Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.

J. Wind-Borne Debris Loads: Design louvers located within 30 feet of grade to withstand ASTM E1996; large missile impact test.

1.5 PERFORMANCE REQUIREMENTS

A. Conform to applicable code for submission of design calculations, reviewed shop and erection drawings, and as required for acquiring permits.

B. Cooperate with regulatory agency or authority and provide data as requested authority having jurisdiction.

C. Provide components of each type from one manufacturer compatible with adjacent materials.

D. Vapor Retarder Permeance: Maximum 1 perm when tested in accordance with ASTM E96/E96M, water method.

1.6 SUBMITTALS

A. Section 013300 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections, attachments, openings, and loads; wall and roof system dimensions, panel layout, general construction details, anchorages and method of anchorage, method or installation; framing anchor bolt settings, sizes, and locations from datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature.

C. Product Data: Submit data on profiles, component dimensions, and performance characteristics.

D. Samples: Submit samples of precoated metal panels for each color available, illustrating color and texture of finish.

E. Manufacturer's Instructions: Submit preparation requirements and anchor bolt placement.

F. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.

1.7 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of concealed components and utilities.

1.8 QUALITY ASSURANCE

A. Perform Work in accordance with AISC S335, AISC S342L, AISC S344L, and MBMA Low Rise Building Systems Manual.

B. Insulation Installed in Concealed Locations Surface Burning Characteristics:

1. Batt Insulation: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

C. Insulation Installed in Exposed Locations Surface Burning Characteristics: 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.9 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Erector: Company specializing in performing Work of this section with minimum 3 years documented] experience and approved by manufacturer.

C. Design structural components, develop shop drawings, and perform shop and site work under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

1.10 WARRANTY

A. Section 017000 - Execution and Closeout Requirements: Product warranties and product bonds.

B. Furnish five year manufacturer warranty for pre-engineered building systems and components.

C. Furnish five year warranty to include coverage for exterior pre-finished surfaces color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading. Include coverage for weather tightness of building enclosure elements after installation.

PART 2 - PRODUCTS

2.1 COMPONENTS - FRAMING

A. Structural Steel Members: ASTM A529/A529M Grade 50 or A572/A572M, Grade 50.

B. Structural Tubing: ASTM A500/A500M, Grade B

C. Plate or Bar Stock: ASTM A529/A529M Grade 50.

D. Anchor Bolts: ASTM A307 Grade A, galvanized.

E. Bolts, Nuts, and Washers: ASTM A325 galvanized.

F. Welding Materials: AWS D1.1; type required for materials being welded.

G. Non-Shrink Grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi 28 days manufactured by.

2.2 COMPONENTS - WALL AND ROOF SYSTEM

A. Sheet Steel: ASTM A653/A653M; G90 zinc coating; 0.030 inch thick.

B. Insulation: Double layer banded insulation system
1. Manufacturer: Owens Corning, Optiliner Banded liner system, or equal
   a. Bay Insulation, Banded System
   b. IDI, Long Tab Banded Insulation System
2. Insulation: Double layer roll glass fiber insulation, unfaced
3. Vapor Barrier: High Density Polyethylene
4. Metal Banding Strips: Coated steel, 1" wide, grade 50
5. Thermal Breaks: Polyethylene strip, 3" wide, 1" thick, minimum R6

C. Joint Seal Gaskets: Manufacturer's standard type.

D. Fasteners: Manufacturer's standard type, galvanized finish to match adjacent surfaces when exterior exposed.

E. Bituminous Paint: Asphaltic type.

F. Sealant: Manufacturer's standard type, non-staining, elastomeric, skinning.

G. Trim, Closure Pieces, Caps, Flashings, and Facias: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.3 COMPONENTS - METAL DOORS AND FRAMES

A. Doors: Specified in Section 081315.

B. Frames: Specified in Section 081215.

2.4 COMPONENTS - OVERHEAD DOORS

A. Overhead Doors: Specified in Section 083613.

2.5 COMPONENTS - WINDOWS

A. Windows: Specified in Section 084113 and 085113.

B. Glass and Glazing: Specified in Section 088000.

2.6 FABRICATION - FRAMING

A. Fabricate members in accordance with AISC Specification for plate, bar, tube, or rolled structural shapes.

B. Anchor Bolts: Formed with straight shank, assembled with template for casting into concrete.

C. Provide framing for door, window, and openings.

2.7 FABRICATION - WALL AND ROOF SYSTEMS

A. Siding: Minimum 22 ga., R-panel, lapped edges fitted with continuous gaskets.

B. Roofing: 22 ga., PBR panel, lapped edges fitted with continuous gaskets.

C. Girts/Purlins: Rolled formed structural shape to receive siding, roofing sheet.

D. Internal and External Corners: Same material thickness and finish as adjacent material, profile brake formed to required angles. Back brace mitered internal corners.

E. Flashings, Closure Pieces, and Fascia: Same material and finish as adjacent material, profile to suit system.

F. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive type.

G. Ventilator: Sheet steel, galvanized, ridge vent.

2.8 FABRICATION - GUTTERS AND DOWNSPOUTS

A. Fabricate of same material and finish as roofing metal.

B. Form gutters and downspouts of profile and size indicated to collect and remove water. Fabricate with connection pieces.

C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.

D. Fabricate support straps of same material and finish as roofing metal, color as selected.

2.9 FACTORY FINISHING

A. Framing Members: Clean, prepare, and galvanize to ASTM A123/A123M; galvanize after fabrication.

B. Galvanizing for Nuts, Bolts and Washers: ASTM A153/A153M.

C. Interior Surfaces of Wall and Roof Components and Accessories: Precoated enamel on steel of modified silicone finish, color as selected from manufacturer's standard range.

D. Exterior Surfaces of Wall and Roof Components and Accessories: Precoated enamel on steel of fluoropolymer finish, color as selected from manufacturer's standard range.

E. Vapor Retarder at Interior Face of Insulation: Sheet vinyl, white.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Coordination and project conditions.

B. Verify foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position.

3.2 ERECTION - FRAMING

A. Erect framing in accordance with AISC Specification.

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. Locate braced bays as indicated on Drawings.

C. Set column base plates with non-shrink grout to achieve full plate bearing.

D. Do not field cut or alter structural members without approval of Architect/Engineer.

E. After erection, prime welds, abrasions, and surfaces not galvanized.

3.3 ERECTION - WALL AND ROOFING SYSTEMS

A. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.

B. Fasten cladding system to structural supports, aligned level and plumb.

C. Locate end laps over supports. End laps minimum 2 inches. Place side laps over bearing.

D. Use exposed fasteners.

E. Install insulation system according to manufacturer's installation instructions. Insulation shall fit snugly against purlin and girts in cavity space. Avoid gaps, voids, and excess compression.

F. Install sealant and gaskets to prevent weather penetration.

3.4 ERECTION - GUTTER AND DOWNSPOUTS

A. Rigidly support and secure components. Joint lengths with formed seams sealed watertight. Flash and seal gutters to downspouts.

B. Apply bituminous paint on surfaces in contact with cementitious materials.

C. Slope gutters minimum .5%

D. Connect downspouts to storm sewer system or install splash pads under each downspout.

3.5 ERECTION TOLERANCES

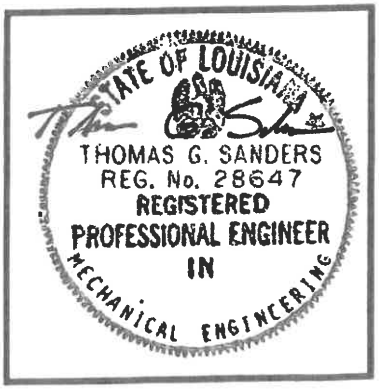
A. Section 014000 - Quality Requirements: Tolerances.

B. Framing Members: ¼ inch from level; 1/8 inch from plumb.

C. Siding and Roofing: 1/8 inch from indicated position.

END OF SECTION 133419

DIVISION 22
PLUMBING



DIVISION 22 - PLUMBING

SECTION 22 05 00 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 SCOPE:

The scope of the plumbing phase of this project shall include all labor, materials, equipment, etc., required to fulfill the intent of the Contract Documents and shall include the work specified under the subsequent sections of Division 22 of these specifications.

1.2 RELATED DOCUMENTS:

All applicable provisions of Divisions 0 and 1 govern work under this Division. Refer to these articles in the specifications for additional information.

1.3 REFERENCES:

1.3.1 All work shall be performed in full accord with the latest editions of the applicable state, and national building codes and local ordinances.

2018 International Plumbing Code – IPC
2018 International Energy Conservation Code - IECC
City of Alexandria, LA Plumbing Code of Ordinances
American with Disabilities Act (ADA)
NSF International - NSF

1.3.2 Refer to each section for additional applicable codes and reference standards.

1.4 FEES, PERMITS AND TAXES:

This Contractor shall make arrangements for and pay for all inspection fees, connection fees and permits required by local authorities and utility providers. The Contractor shall also pay all taxes levied for labor and materials associated with work under this Division.

1.5 SUBMITTALS:

1.5.1 Refer to Architectural specifications for additional information on submittals.

1.5.2 Refer to AIA General Conditions.

1.5.3 In addition to the requirements of the above referenced portions of this specification, all Subcontractors proposing to do work under this Division shall comply with the following additional requirements:

A. These specifications and drawings are intended to indicate a standard of quality for materials and equipment which is established by the listing of manufacturer's names and catalog numbers and/or by referenced standards. Materials and equipment that do not comply with these standards of quality will not be considered for substitution.

B. As soon as practicable and within thirty (30) days after the award of the contract and before beginning the fabrication of any material or the installation of any equipment, data shall be submitted in written hard copy form for approval on equipment and materials where noted. Materials (pipe, fittings, etc.) may be listed with the name of the manufacturer and identifying catalogue numbers. Data for equipment shall include manufacturer's name, catalog data,

diagrams, drawings and other descriptive data as required or requested by the Architect for evaluation.

C. Notwithstanding any reference in the specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalogue number, such references shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product material, fixture, form or type of construction which in the judgment of the Architect expressed in writing, is equal to that specified.

D. All data shall be carefully examined and shall be forwarded for approval with a signed certification to the effect that the data has been carefully checked and found to be correct with respect to dimensions and available space and that the equipment complies with all requirements of the specifications.

E. Point out in writing all deviations between the plans and specifications and the materials submitted.

F. It is understood that proof of equality is the responsibility of the Contractor and/or supplier and that it is not the responsibility of the Architect to prove the inequality of the proposed substitutions. Furthermore, the decisions of the Architect are final.

1.5.4 While it is not the intention of the Architect to discriminate against any manufacturer of equipment which is equal to specified equipment, a strict interpretation of such equality will be exercised by the Architect in considering any equipment offered as a substitute for equipment named in the specification. It shall be the responsibility of the Contractor to submit with each request for approval of substitute material or equipment, sufficient data as determined by the architect to show conclusively that it is equal to the material or equipment specified.

1.5.5 Each Contractor shall submit shop drawings and/or diagrams for approval and for job coordination in all cases where significant deviations from the contract drawings are contemplated because of job conditions, interferences, or substitutions of equipment, or when requested by the Architect for purposes of clarification of the Contractor's intent. He shall also submit detailed shop drawings, rough-in sheets, etc., for all special or custom built items of equipment.

1.5.6 Submittal of shop drawings shall be made in sufficient quantities to provide one (1) copy of all data to be retained by the Engineer; two (2) copies of all data to be accumulated for the Owner; one (1) copy of all data to be retained by the Contractor; one (1) copy of all data to be retained by the Architect.

1.5.7 Should any substitute items be submitted and disapproved, then those items must be furnished exactly as described herein.

1.5.8 The Architect's review of shop drawings and/or submittal data shall not relieve the Contractor of responsibility for deviations from the contract drawings or specifications.

1.5.9 The size of equipment shown on the drawings is based on the dimensions of a particular manufacturer. While other manufacturers may be acceptable, it is the responsibility of the Contractor to determine if the equipment he proposes to furnish will fit in the space. Shop drawings shall be prepared when required by the Architect/Engineer or Owner to indicate a suitable arrangement.

1.5.10 Prior to ordering any equipment, the contractor shall furnish to the electrical contractor an itemized list of all equipment, motors, actuators, etc. requiring electrical power. The list shall include the item and its location, voltage, phase, horsepower and amperage. A copy of the list shall be submitted to the architect.

1.6 PRIOR APPROVAL:

Where the contractor wishes to substitute equipment or materials under an "or equal" clause, he shall submit to the Architect via hand delivery or U.S. mail in written hard copy form seven (7) work days prior to bid opening lists of proposed substitutions which, from published manufacturer's data, cover the salient features of the proposed substitution. Contractor shall indicate in writing all differences between specified equipment or materials and proposed substitution. Approvals will be issued in writing by addendum.

1.7 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS:

1.7.1 The Owner's operating personnel shall be instructed by the Contractor on how to start and operate each item of equipment. Safety features shall be pointed out, particularly the possible troubles which might cause the safety controls to operate and what might be done to remedy the trouble.

1.7.2 The Owner's operating personnel shall be thoroughly instructed in the operation of the plumbing systems. Instructions should include an explanation of the system and system operation, the proper set points, etc., and how to change the settings. Instructions shall include an explanation of components which should not be tampered with or control settings which should not be changed except by authorized personnel of the manufacturer.

1.7.3 Relative to the plumbing system, instruct the Owner's operating personnel in the following:

A. Removal of service access panels from equipment. If special tools are required, turn over to the Owner at least one set.

B. How to drain and fill all piping and equipment.

C. How to vent air from the system.

D. Location of concealed valves, traps, etc., requiring periodic maintenance and location of access to them.

1.7.4 Provide (4) four copies of operating and maintenance manuals. Manuals shall be bound in large ring, loose-leaf binders and contain the following:

A. Manufacturer's instructions and/or installation manual.

B. Manufacturer's service manual.

C. Manufacturer's lubrication chart listing types of lubricant to be used on each item of equipment and recommended frequency of lubrication.

D. Electrical diagrams of each equipment "packaged" control system.

E. Diagrams of automatic control systems, identifying each by name, location and number showing sequence of operation. Each component of a control system shall be identified. All diagrams shall be up-to-date, reflecting any on-the-job changes.

F. Parts lists and identifying part numbers with prices of each part. The name and address of the nearest distributor from which parts can be obtained.

1.8 WARRANTY:

1.8.1 This contractor shall warrant all workmanship, material, equipment systems, etc., provided by him for a period of one year after substantial completion of the project. This warranty means that this contractor shall make good to the Owner, at no cost, any defects that become apparent during the year following substantial

completion. This warranty is in addition to any other guarantees or warranties and is not intended to limit such other guarantees or warranties.

1.8.2 Manufacturer's disclaimers and limitations on product warranties do not relieve the contractor of the requirements of the warranties listed throughout the specifications.

1.9 DEFINITIONS: The following words and phrases as used herein are hereby defined:

1.9.1 "provide": Furnish and install all material and labor required for a complete installation ready for operation in accordance with the intent of the Contract Documents.

1.9.2 "as required": Indicates that the Contractor shall perform the work or provide the material as indicated in accordance with manufacturer's installation instructions; and in accordance with applicable codes or regulations; and in a workmanlike manner as defined by good local practice.

1.9.3 "or equal": Indicates that the Contractor may substitute equipment by another manufacturer if the salient features of the equipment indicated by manufacturer's name and/or described are, in the judgment of the Architect, adequate. Submittals for approval are required where indicated.

1.9.4 "contractor": Where the word(s) "Contractor" or "this Contractor" is/are used, they refer to the Contractor engaged to execute the work under this division of the specifications only, even though he may be technically described as a sub-contractor.

1.9.5 "intent of the Contract Documents": The specific intent of these documents is to provide to the Owner, in a thoroughly functional condition, all the various systems, equipment, etc., indicated herein. Final authority over interpretation of the "intent" shall rest with the Architect.

1.9.6 "shall": Indicates a mandatory requirement.

1.10 INSPECTION OF THE SITE:

1.10.1 The drawings are prepared from the best information available and reflect all conditions commensurate with this information. However, the contractor should visit the site prior to submitting a proposal and should verify the locations, sizes, depths, pressures, etc., of all existing utilities and familiarize himself with working conditions, hazards, existing grades, soil conditions, obstructions, etc. If it becomes evident that existing site conditions will impair the proper operation of the utilities, the Architect shall be notified in writing.

1.10.2 All proposals shall take these existing conditions and any revisions required into consideration.

1.11 CONSTRUCTION REQUIREMENTS:

1.11.1 The Contractor shall be responsible for fitting his material and apparatus into the building and shall carefully lay out his work at the site to conform to the structural conditions, to provide proper grading of lines, to avoid all obstructions and to conform to the details of the installation supplied by the manufacturer of the equipment to be installed. Furnish all necessary pilot lines and control lines whether indicated on the drawings or not. The drawings do not give exact details as to elevations of pipe lines nor do they show exact locations of pipe to scale. Piping elevations shall be handled by giving precedence to pipes which require a stated grade for proper operation. Devices necessary for installation and support of pipes, and equipment (such as sleeves, inserts, etc.) shall be located and installed as the construction progresses in order to allow completion of each phase of the work in the proper sequence.

1.11.2 Drawings showing the extent and arrangement of the work of a particular trade shall be used together with drawings showing extent and arrangement of work of other trades to insure that the Contractor in laying out and installing his work shall do so in a manner such that the work of the several trades may progress in the most direct, workmanlike and harmonious manner.

1.11.3 The Contractor shall be responsible for the proper location and size of slots, holes or openings in the building structure pertaining to his work, and for the correct location of pipe sleeves. The drawings indicate the extent and general arrangement of the various systems, but if any departures from these drawings are deemed necessary by the contractor, detailed drawings and descriptions of these departures and a statement of the reasons therefore shall be submitted to the Architect as soon as practicable. No departures from the arrangements shown on the drawings shall be made without prior written approval of Architect.

1.11.4 In general, piping in finished areas of the building shall be run concealed unless noted and directed otherwise. Should any conditions arise which would cause any piping to be exposed in finished areas, it shall be immediately called to the Architect's attention. In unfinished spaces such as equipment rooms, all pipe shall be run as high as possible, shall be run to a continuous grade and shall be grouped wherever it is feasible to do so.

1.11.5 All pipe, etc., shall be cut accurately to measurements established at the building and shall be worked into place without springing or forcing. All pipes run exposed in machinery and equipment rooms shall be installed parallel to the building planes except that the lines shall be sloped to obtain the proper pitch. Piping run above furred ceilings, etc., shall be similarly installed, except as otherwise shown. All pipe openings shall be kept closed during construction until the systems are closed with final connections.

1.11.6 The construction details of the building are illustrated on the Architectural and Structural Drawings. The trades shall thoroughly acquaint themselves with the details before submitting their bid as no allowance will be made because of unfamiliarity with these details. Place all inserts to accommodate the ultimate installation of pipe hangers in the forms before concrete is poured and set sleeves in forms before construction. Explosive or compression driven inserts shall only be allowed for use as approved by SMACNA and the manufacturer of these devices. All concealed lines shall be installed as required by the pace of the job to precede the general construction.

1.11.7 The plans do not give exact locations of outlets, fixtures, equipment items, etc. The exact location of each item shall be determined by reference to the general plans and to all detail drawings, equipment drawings, roughing-in drawings, etc., by measurements at the building and in cooperation with other trades. Minor relocations necessitated by the conditions at the site or directed by the Owner shall be made without additional cost to the Owner.

1.11.8 All oiling devices and all parts of equipment requiring adjustment shall be easily accessible. Equipment shall be so located and installed as to permit convenient and safe maintenance and future replacement. The trade furnishing the equipment shall be responsible prior to ordering same in the event that equipment specified and/or approved is incompatible with this requirement.

1.12 ISOLATION:

1.12.1 Transmission of perceptible vibration, structure-borne noise, or objectional air borne noise to occupied areas by equipment installed under this contract will not be permitted.

1.12.2 The isolation supplier shall be a firm or individual capable of dealing effectively with vibration and noise characteristics, effects and criteria and have facilities and capabilities for measuring and evaluating such disturbances and the preparation of drawings and installation instructions.

1.13 CONSTRUCTION SAFETY:

This contractor assumes all responsibility regarding the safety of his personnel on the project during construction. The Contract Documents do not include materials, procedures, components, etc., required to ensure construction safety. Refer to General Conditions and Supplementary General Conditions for additional information.

1.14 DAMAGE:

1.14.1 This Contractor shall be responsible for damage to project caused by this Contractor's failure to recognize hazards associated with items such as leaks, scheduling of work, inexperienced workmen, excessive cutting, etc.

1.14.2 This Contractor shall repair, at no expense to the Owner, any such damage.

1.14.3 This contractor shall familiarize himself with working conditions to the extent that he shall be responsible for damage to concealed piping, wiring and other equipment to remain and shall repair any damage caused by his negligence at no cost to the Owner.

1.15 SAFETY GUARDS:

Contractor shall furnish and install all safety guards required. All belt driven equipment, projecting shafts and other rotating parts shall be enclosed or adequately guarded.

1.16 STORAGE OF MATERIALS:

Each contractor shall provide space for storage of materials, equipment or tools at ground level. Any storage contemplated within the building will be allowed only upon specific approval of the Architect.

1.17 LOCAL CUSTOMS:

Unless specifically referenced herein, each Sub-contractor shall comply with local customs as to which particular trade shall install any part or parts of any work or equipment specified herein.

1.18 MANUFACTURER'S DIRECTIONS:

The manufacturers' published directions shall be followed in the delivery, storage, protection, installation, piping and wiring of all equipment and material. The Contractor shall promptly notify the Architect in writing of any conflict between the requirements of the contract documents and the manufacturers' directions and shall obtain the Architect's instructions before proceeding with the work. Any such work performed that does not comply with the manufacturers' directions shall have deficiencies corrected at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS:

All materials shall be new and free from defects at the time of installation. Materials or equipment damaged in shipment or otherwise damaged prior to installation shall not be repaired at the job site, but shall be replaced with new materials. Materials or equipment damaged after installation shall be repaired or replaced as directed by the Architect.

2.2 MANUFACTURER'S REQUIREMENTS:

When a manufacturer's name appears in these specifications, it is not to be construed that the manufacturer does not have to meet the full requirements of the specifications or that his standard cataloged item will be acceptable.

2.3 SERVICE AND REPAIR PARTS:

All equipment installed on this project shall have local representation, local factory authorized service, and a local stock of repair parts.

2.4 FLAME SPREAD PROPERTIES OF MATERIALS:

All materials and adhesives used for plumbing work, insulation, etc. shall conform to NFPA and UL life, safety and flame spread properties of materials. The composite classifications shall not exceed 25 for a flame spread rating and 50 for a smoke developed rating for these classifications as listed for the basic materials. The finishes, adhesives, etc., specified for each system shall be such when completely assembled.

2.5 ACCESS PANELS:

Provide flush mounted metal access panels and frames with concealed hinges and key actuated locks for all concealed and otherwise inaccessible valves, parts, fittings, equipment, filters, etc. and as required for inspection or service.

2.6 FLOOR, CEILING AND WALL PLATES:

2.6.1 Refer to AIA General Conditions.

2.6.2 In addition to the requirements of the above referenced portions of this specification, all Subcontractors shall furnish a chromium plated sectional escutcheon in each finished space on each pipe or hanger rod penetrating a wall, floor or ceiling. Escutcheons shall be sized to fit snugly to all lines and where the lines are insulated, the escutcheons shall be fit snugly over the insulation. These plates shall be provided with set screws so that they fit snugly against the finished surface. All equipment rooms are classified as finished space.

2.7 IDENTIFICATION:

2.7.1 Each piece of equipment; every valve whose service and/or duty is not readily apparent; every piping system except cast iron sewer lines, shall be permanently and clearly identified.

2.7.2 Equipment and valves shall be provided with laminated phenolic nameplates, appropriately engraved with proper identification correlated to the designation shown on the drawings. Punched plastic tape will not be acceptable. Insulated equipment may have identification taped on as for piping system.

2.7.3 Piping systems shall have designation on ten foot (10'-0") centers and closer where required to provide adequate identification, using "all temperature permacode" pipe markers with direction of flow and service indication. Piping systems in mechanical rooms shall be painted and stenciled identifying the system.

2.7.4 All pipe markers shall conform to ANSI-A-13 "Scheme for the Identification of Piping Systems". Arrow markers must have the same ANSI background colors as their companion pipe markers.

2.7.5 All piping which is electrically heat traced shall have designation "ELECTRIC TRACED" on ten foot (10'-0") center minimum or at each room.

2.7.6 Contractor shall obtain written approval of proposed identification scheme prior to application.

2.8 SLEEVES AND PENETRATIONS:

2.8.1 Refer to AIA General Conditions.

2.8.2 Each and every pipe, regardless of material, which passes through a concrete slab, (except slab on grade), masonry wall, roof or other portion of the building structure shall be free from the structure and shall pass through a sleeve furnished and installed by the Subcontractor responsible for the work involved.

2.8.3 Above grade and dry location sleeves shall be constructed from 20 to 22 gauge galvanized steel and shall be flush on both sides of wall surface penetrated. The sleeves shall be sized to allow free passage of

the pipe to be inserted, and when this pipe is to be insulated, the sleeves shall be large enough to pass the insulation. Floor sleeves located in pipe chases shall extend up two inches (2") above the floor slab.

2.8.4 Sleeves passing through walls or floors on or below grade and/or in moist areas shall be constructed of galvanized steel, schedule 40 pipe and shall be designed with suitable flange in the center of the floor or wall to form a waterproof passage. After the pipes have been installed in the sleeves, void space around the pipe shall be caulked to insure a waterproof penetration. Fire ratings of rated walls and floors shall be maintained by the use of approved materials.

2.8.5 All penetrations through fire rated ceilings, walls or floors shall be fire stopped using approved materials to maintain the fire rating of the ceiling, wall or floor structure. Penetrations shall meet or exceed the requirements set forth in the U.L. Fire Resistance Directory, Volumes I and II. Provide directory reference plates as requested.

2.8.6 After installation of pipe through sleeves, all sleeves shall be sealed with materials suitable for maintaining thermal resistance, acoustic properties, and weatherproofing of walls, roofs, etc. Refer to Architectural specifications.

PART 3 - EXECUTION

3.1 WORKMANSHIP:

3.1.1 All work shall be done by experienced craftsmen skilled in the applicable trade.

3.1.2 Unprofessional and incomplete work shall be rejected and corrected at no additional expense.

3.2 PROTECTION OF EQUIPMENT:

The Contractor shall continuously maintain adequate protection of both stored and installed materials and equipment. Fixtures, piping, and equipment, whether located inside or outside, shall be tightly covered with sheet polyethylene or waterproof tarpaulin as protection against dirt, rust, moisture and abuse from other trades. Adequate air circulation shall be provided under any protective sheet to prevent condensate build up. Materials and equipment shall not be stored directly on the ground, floor, or roof deck. Piping and equipment shall not be used by other trades as supports for scaffolds or personnel. At the completion of the work, equipment, fixtures, exposed supports, and piping shall be cleaned of dirt, construction debris, overspray, etc., to the satisfaction of the Architect. Repairs made necessary by damage shall be paid for by the Contractor.

3.3 PROTECTION OF STRUCTURE:

Each Contractor in performing his work shall take particular care not to damage the structure. All finished floors and step treads shall be covered to prevent any damage by workmen or their tools and equipment during the construction of the building. In addition, each Contractor shall protect any materials on the job site whether a part of this contract or the property of another Contractor.

3.4 FOUNDATIONS:

3.4.1 Concrete foundations required by equipment shall be constructed by this Contractor. See Concrete Work.

3.4.2 Equipment shall be set in place on the bases, leveled and aligned by means of shims, piped, then grouted in, in that order. After grouting, the forms shall be removed and the surfaces of the foundation shall be hand-rubbed with carborundum. Concrete work shall conform to the requirements of General Specifications, Concrete Work, of this specification.

3.5 CONFLICTS, INTERFERENCES AND COORDINATION BETWEEN TRADES:

3.5.1 The drawings are not to be construed as shop drawings, but indicate the extent, general location, arrangement, etc., of piping systems and equipment. This Contractor shall refer to other sections of the specifications and other drawings such as HVAC, electrical, structural, architectural, etc., in order to eliminate conflicts and undue delays in the progress of the work. Where other Contractors furnish items requiring piping connections by this Contractor, they will be held responsible for providing roughing-in drawings and assistance upon request.

3.5.2 Each trade shall so harmonize its work with that of the other trades so that the work may be done in the most direct and workmanlike manner without hindering the other trades. Piping interference shall be handled by giving precedence to pipe lines which require a stated grade for proper operation. Where space requirements conflict, the following order of precedence shall be observed:

A. Building lines

B. Structural members

C. Soil and drain piping

D. Vent piping

E. HVAC Refrigerant piping

F. HVAC Condensate piping

G. HVAC Supply ductwork

H. HVAC Exhaust ductwork

I. Domestic water

J. Electrical conduit

K. Natural gas piping

3.5.3 In the event of conflicts between specifications and drawings, drawings shall take precedence over specifications except in matters pertaining to quality, applications, and coordination between trades, which shall be governed by specifications.

3.5.4 Plans, specifications and other documents have been prepared and developed with reasonable professional care and coordination. It is the intent that all documents are supportive and complimentary, one to the other; and as such what is required by one shall be considered as required and binding as if indicated by all. Work indicated shall include, regardless of whether or not specifically indicated, such supportive or required items or work as is consistent with what is indicated, is reasonably inferable from what is indicated, and/or is common construction procedure or knowledge with regard to what is indicated.

3.5.5 In the event of conflict between codes, as interpreted by the authority having jurisdiction and the contract documents, the codes shall govern.

3.5.6 In the event of conflict between manufacturer's installation instructions and the drawings, the manufacturer's installation instructions shall govern.

3.5.7 Should discrepancies be found between the documents and/or an interpretation is required, and a decision or interpretation to the contractor is not rendered by the Architect, it shall be assumed the contractor

has reviewed all the documents to find the most costly method for items in question which then shall be required. One document does not take precedence over another when interpreting a discrepancy.

3.6 CUTTING AND PATCHING:

3.6.1 All cutting required by the installation of sleeves, piping, equipment, etc., shall be coordinated with the General Contractor, but performed by this Contractor. Patching shall be coordinated with the General Contractor. This Contractor shall not cut any structural element or any finished work without permission from the Architect.

3.6.2 This Contractor shall cut and patch all paving as required by the installation of buried piping, including utilities.

3.7 CONCRETE WORK:

3.7.1 This Contractor shall provide all forming, reinforcing and concrete as indicated such as equipment bases, plumbing stack supports, valve and cleanout pads. Work shall conform to applicable portion of Division 3 CONCRETE.

3.7.2 Reinforcing of concrete pads shall include minimum #4 bar 12" O.C. both ways unless noted otherwise on the plans.

3.8 PAINTING:

3.8.1 All painting except "touch-up", mechanical room piping, gas piping, and prime painting for ferrous piping shall be provided under the painting sections (Division 9) unless noted otherwise. All exposed piping, equipment, etc., shall be left clean and free from rust or grease and ready for the painter.

3.8.2 Where equipment finishes are damaged, this Contractor shall obtain matching color touch-up paint from the equipment's manufacturer and paint as required.

3.8.3 For steel and iron surfaces, remove grease, mill scale, weld splatter, dirt, and rust. Apply one coat of metal primer DFT 3 mils and two coats of enamel alkyd semi-gloss paint DFT 3-5 mils.

3.9 TRENCHING AND BACKFILL:

3.9.1 All necessary excavation and backfill for the installation of plumbing, work shall be accomplished by each trade Subcontractor under his phase of the work. All such work shall be included regardless of the type of materials encountered in the excavation.

3.9.2 Trenches for all underground piping shall be excavated to the required depths. The banks of trenches shall be kept as nearly vertical as practicable and where required shall be properly formed and braced. Trenches shall be not less than 12" wider than the outside diameter of the pipe to be laid therein. The bottoms of the trenches shall be tamped hard and graded to secure proper fall. Bell holes shall be excavated to a depth 6" below the bottom of the pipe and shall be backfilled to the proper grade with pea gravel or sand thoroughly tamped. Pipe laid in trenches dug in fill shall be supported down to load bearing undisturbed soil. After the pipes have been tested, inspected and approved by inspecting authorities, the trenches shall be backfilled.

3.9.3 The trenches beneath and within six feet of the building shall be carefully backfilled with pea gravel or approved river sand depth of six (6) inches above the top of the pipe. The next layer and subsequent layers of backfill may be excavated materials if of earth, loam, sand or gravel free of large clods and with rocks no larger than 1-1/2" in diameter. Backfill shall be installed in layers 6" deep, adequately tamped and wetted down before the next layer of earth is laid in place. This additional material required for backfilling shall be furnished and any excess materials and debris shall be removed from the site. Any special backfill material shall be provided as specified or shown on the drawings.

3.9.4 All excavating and backfilling shall be done in a manner so as not to disturb adjacent structures and any shoring required shall be provided.

3.10 LUBRICATION:

This Contractor shall provide all lubricants for the operation of all equipment until acceptance. The Contractor shall be required to protect all bearings during the installation and shall thoroughly grease steel shafts to prevent corrosion. All motors and other equipment shall be provided with covers as required for proper protection during construction. All equipment bearings requiring periodic lubrication shall be provided with proper fittings for this purpose. Where equipment requiring such lubrication is not readily accessible due to location, copper tubing extensions shall be provided in addition to lubrication fittings.

3.11 ELECTRICAL WORK:

3.11.1 Except for such items that are completely wired at their point of manufacture and so delivered and unless specifically noted to the contrary herein, the Electrical Contractor shall provide all electric wiring (100 VAC and above) for power supply and control. This includes mounting of all electrical devices furnished under this section (Plumbing) of these specifications.

3.11.2 Conduit and wiring (below 100 VAC) for all automatic controls, temperature control, temperature indication, and interlock shall be provided by the Plumbing Contractor. The furnishing of all disconnect switches as required for proper operation as shown on the drawings and required by code will be under Electrical Work, except where specifically designated on the plans. The Plumbing Contractor shall coordinate all 100 VAC and above requirements with the electrical contractor prior to bid, and shall coordinate all wiring and conduit requirements below 100 VAC with the mechanical (HVAC) contractor prior to bid.

3.11.3 Furnishing of complete wiring diagrams showing power wiring and interlock wiring shall be work under the trade supplying the equipment. Diagrams shall be based on approved equipment and shall be complete integral drawings, not a series of manufacturer's individual diagrams. After these diagrams have been approved by the Architect/Engineer, copies shall be furnished to the trades involved and they shall be followed in detail.

3.11.4 The electrical design and drawings are based on the equipment scheduled and shown on the drawings and should any equipment requiring changes to the electrical design be approved, the required electrical changes shall be made at the expense of the trade furnishing the changed equipment and at no cost to the Owner.

3.12 EQUIPMENT CONNECTION:

This Contractor shall bring required services to equipment items furnished under other sections of this specification or by the Owner, make final connections, and leave equipment ready for operation. Where it is necessary for Contractors performing work covered by this section to make final connections to items of equipment being furnished by Contractors under other sections, all such work shall be performed in a neat and workmanlike manner and all materials shall be of quality and finish normally used for such installation.

3.13 EQUIPMENT AND AIR INTAKE ARRANGEMENTS:

3.13.1 All equipment shall be installed in a manner to permit access to all surfaces requiring access. All valves, motors, drives, lubrication devices, filters and other necessary items shall be installed in a position to allow removal for service without disassembly of another part.

3.13.2 HVAC Outside air, ventilation and combustion air intakes shall be separated from flues, plumbing vent stacks, etc. to avoid infiltration of odors, fumes and other contaminants. Separation shall be 12 ft. minimum.

3.14 EXECUTION OF WORK:

The Contractor shall plan, schedule and execute his work and that of any of his Sub-contractors so as not to interfere with the work of other trades or Contractors in the building or on the premises.

3.15 FLASHING AND WATERPROOFING:

All building penetrations to outside shall be flashed and counter flashed as required to eliminate leaks.

3.16 TESTS:

All tests shall be made by this Contractor and repeated until approved by the Architect. Piping systems shall not be covered or otherwise concealed until tests have been made and approvals obtained. Notify the Architect four days prior to tests to allow for scheduling. Test the piping systems as indicated in applicable articles.

3.17 CLEAN-UP:

3.17.1 It shall be the responsibility of each trade to cooperate fully with the other trades on the job to help keep the job site in a clean and safe condition. At the end of each day's work, each trade shall properly store all of his tools, equipment, any surplus materials and shall remove all debris caused by his portion of the work.

3.17.2 When all work has been finally tested, the Contractor shall clean all work installed by him, including all fixtures, equipment, pipes, and all exposed work. All pipes shall be flushed out and left free of all obstructions. All plates, fixtures, and other finished products shall be thoroughly cleaned and polished.

3.18 FINAL OBSERVATIONS:

3.18.1 It shall be the duty of the Contractor to make a careful inspection trip of the entire project, assuring himself that the work on the project is ready for final acceptance, before calling upon the Architect/Engineer to make a final observation.

3.18.2 In order not to delay final acceptance of the work, the Contractor shall have all necessary bonds, guarantees, receipts, affidavits, etc., called for in the various articles of this specification, prepared and signed in advance, and together with a letter of transmittal listing each paper included, and shall deliver the same to the Architect/Engineer at or before the time of the final observations. The Contractor is cautioned to check over each bond, receipt, etc., before preparing same for submission to see that the items check with the requirements of the specification.

END OF SECTION

SECTION 22 05 23 - GENERAL DUTY PLUMBING PIPING

PART 1 - GENERAL

1.1 SCOPE:

1.1.1 Work in this section shall include piping, fittings, accessories etc., to be used in piping systems in accordance with the intent of the Contract Documents and shall include the following principal items:

Piping
Valves
Piping Accessories

1.1.2 Refer to Section 22 05 00 for Common Work Results for Plumbing.

1.2 REFERENCED STANDARDS:

National Institute of Standards and Technology (NIST).
Cast Iron Soil Pipe Institute (CISPI).
American Society of Testing & Materials (ASTM).
American Water Works Association (AWWA).
National Fire Protection Association (NFPA).
Factory Mutual Engineering Corporation (FM).
American Society of Mechanical Engineers (ASME).
NSF International (NSF).

1.3 SUBMITTALS:

Submittals are required as indicated only. Submittal of pipe and fittings is not required unless a deviation from the specification is proposed.

PART 2 - PRODUCTS

2.1 DOMESTIC WATER PIPING:

2.1.1 Domestic water piping shall be Type "L" copper, per ASTM B-88, or SCH 40 PVC per ASTM D-2466-78 if approved by local code officials.

2.1.2 Domestic water piping under the building slab shall be type "L" soft drawn commercially pure copper water pipe, per ASTM B-88. The use of joints in the piping beneath concrete slabs will be avoided and will be permitted only to the extent of long runs where a single roll of length of copper tubing is not of sufficient length to complete the piping run. Should a joint be required, the joint shall be made with silver-fos solder and wrought solder joint copper fittings.

2.1.3 Domestic water piping within the building and above ground, shall be type "L" hard drawn commercially pure copper joint fittings per ASTM B-88 and hard solder. Flux shall be a non-corrosive paste type. Cored solder will not be allowed; all solder shall be a solid string or wire type. Where soldered copper piping must be connected to screwed brass pipe, a cast brass adaptor shall be used. Piping shall be assembled with 95-5 tin/antimony solder or 95-5 tin/silver solder. No solder containing lead shall be used.

2.1.4 Water piping connections to fixtures or equipment shall be made by use of brass pipe or nipples, chrome plated where exposed to view in finished areas, screwed into copper to IPS adaptor fittings. Ferrous piping connections shall not be used in copper piping systems.

2.1.5 Dielectric insulating couplings shall be provided between ferrous and copper piping systems.

2.1.6 Domestic water piping control valves shall be provided by this Contractor where required to adequately control and isolate the various domestic water piping systems. Provide stem extensions for insulated valves. (Reference Section 22 07 00 for insulation thickness.) Valves shall be as manufactured by Nibco, Stockham, Milwaukee, Hammond or Grinnell and equal to Milwaukee or Nibco numbers as stated below:

A. Gate valves throughout the domestic water piping shall be equal to Nibco S-111-LF or Milwaukee Gate 149, solder joint, 125 lb., rising stem, solid wedge disc.

B. Check valves shall be equal to Nibco S-413-Y-LF or Milwaukee Check 1509-S, 125 lb., bronze check valve with "Buna-N" disc.

C. Temperature and pressure relief valves shall be ASME rated.

D. Ball valves throughout the domestic water system shall be solder joint, 600 psi WOG, chrome-plated ball, reinforced TFE seats, full-port, quarter-turn, two-piece.

E. Hot water return line balancing valves shall be solder joint, lead free, fixed orifice circuit balancing valves with dezincification resistance.

2.1.7 On each hot and cold supply to fixture groups, provide a manufactured water hammer arrestor protective device. These shall be of the size recommended by the manufacturer for the particular application and installed in accordance with Plumbing and Drainage Institute Standard PDI-WH201. Contractor may alternately provide air chambers the same size as the supplies to the fixture and not less than 24" long. These air chambers shall be located directly behind the supply connection to the fixture and shall have a capped top, shall be constructed of the same material as the piping system in which they are installed, and shall be insulated in the same manner as the balance of the piping system in which they are installed.

2.1.8 All components of the potable water system including but not limited to piping, fittings, fixtures, flux, solder, etc. shall meet NSF 60, 61, and 372 requirements. The system shall be lead free.

2.2 SANITARY DRAINAGE AND VENT PIPING:

2.2.1 All sanitary drainage lines (soil, waste and vent) shall be cast iron soil pipe and fittings per ASTM A74, coated inside and out and shall be labeled with the C.I. mark of quality and permanence as illustrated in Commercial Standard CS-188, which indicates that it complies with this standard. Weight of pipe shall be Class "SV" service weight. Joints shall be fabricated by the use of compression type joints similar to Tyler Pipe and Foundry's "Ty-Seal". "No Hub" piping per ASTM A-888 will be acceptable if approved by the Plumbing Inspector but shall be limited to above ground installation.

2.2.2 At the Contractor's option and where approved by local code authorities, sanitary drainage and vent piping may be type DWV Schedule 40 solid wall PVC pipe and fittings per ASTM D2665. It shall be the Contractor's responsibility to obtain approval from local authorities. PVC piping shall not be permitted in return air plenums or exposed interior and exterior to the building. All vents through roof (VTRs) shall be service weight cast iron with a cast iron to PVC adaptor or transition fitting as required. PVC piping below slab shall be installed per ASTM D2321.

2.2.3 Horizontal waste and soil pipe shall be given a grade of 1/4" per foot where possible and not less than 1/8" per foot. Waste and soil piping 2-1/2" and smaller shall be given a grade of 1/4" per foot minimum. Where practicable, two or more vents shall be connected together and extended as one vent through the roof. Vent and waste connections to stacks shall be made by the appropriate use of forty-five (45) degrees wyes, long sweep quarter bends, sixth, eight, or sixteenth bends as approved by local codes except that sanitary tees and sanitary crosses shall be used on the connection to vertical stacks. Provide piping offsets in vertical vent stacks as required to maintain a minimum 15 ft. separation between plumbing vents through roof and air intakes.

2.2.4 Vents shall be extended at least 12" above roof and shall be flashed per roofing manufacturer requirements as follows:

1. Metal Roof - Use a 1 piece flexible base recommended by the metal roofing manufacturer. The base shall be E.P.D.M. (Ethylene Propylene Diene Monomer) rubber with a ductile aluminum alloy reinforcing base ring bonded to a rubber flange on the base of the flashing unit. Assembly shall be manufactured by and installed in accordance with Butler Manufacturing Company or prior approved equal.

2. Membrane Roof –

   a. Install fasteners and plates as required around vent penetrations, using reinforced membrane. Cut out flashings as required and apply bonding adhesive to both the underside of the flashing and to the vent piping and the field sheet up to the outside edge of the fastener line.

   b. Allow the bonding adhesive to dry to finger touch until it does not string or stick to a dry finger. Roll the flashing into the dry adhesive to complete the bond. Be sure that the flashing does not bridge where there is any change of direction. All flashings must be mechanically fastened at the top (under appropriate counterflashing or using an appropriate retainer) with approved fasteners. Laps must extend a minimum of 2-1/2 inches beyond fasteners onto field sheet or half sheet, as appropriate.

   c. After flashing is adhered in place, promote full contact adhesion by going back over entire area with roller, broom, or hand pressure.

3. Other Roof Types - Use 4 lb. lead with the base extending at least 10" in every direction from stack. The vertical portion of the flashing shall extend upward the entire length of the vent pipe and turn down inside the pipe at least 2" to provide a weather-tight joint.

2.2.5 Cleanouts shall be provided at each change in direction of the soil lines, at the end of each continuous waste line, at the foot of each riser within the building and at 80'-0" intervals in horizontal lines 4" and larger, and at 50'-0" intervals in horizontal lines 3" and smaller except as noted. The sizes of cleanouts shall be identical with the size of soil or waste lines in which they are placed, except that cleanouts larger than four inches (4") in diameter will not be required. Cleanouts must be placed in accessible locations and where they occur in pipe chases, said cleanouts shall be placed above the floors in such a manner that they will be accessible through doors or they shall be brought through the wall and provided with flush covers. Exact locations of each shall be approved by the Architect before installation. All cleanouts shall be of the type specifically designed for installation in the type of wall in which they are installed. Wherever cleanouts shall occur in finished floors, they shall be specifically designed for the type of floor in which they are installed. All cleanouts located in exterior locations shall be encased in 14" x 14" x 6" concrete pads unless installed in a walk drive or other paved area. All cleanouts in walls or other painted surfaces shall be of type furnished in prime coat to be painted on the job to match the surface in which they are installed. All cover plates on cleanouts shall be attached with vandal-proof screws. Wall cleanouts shall be mounted in accessible locations at 3'-0" above finished floor where possible, and no lower than 1'-6" to centerline.

2.2.6 Each fixture and piece of equipment requiring connection to the sanitary drainage system, except fixtures with integral traps, shall be equipped with a deep seal trap. Each trap shall be placed as near to the fixture as possible and no fixture shall be double trapped unless permitted by governing codes.

2.2.7 Hub drains, open-site drains and floor drains connected to the sanitary drainage system shall be provided with deep seal P-traps. P-traps used for open-site condensate termination shall be deep seal type and shall be equipped with a trap guard device. The Plumbing Subcontractor shall provide all hub drains, open-site drains, and floor drains required for condensate drain termination, whether indicated on plan or not. Coordinate with HVAC Subcontractor accordingly. Termination points shall be within 10 feet of HVAC equipment unless indicated otherwise.

2.3 DRAIN AND RELIEF PIPING:

2.3.1 Condensate drain piping, auxiliary drain piping, equipment drains, appliance drain piping and water heater relief piping shall be type "L" hard drawn copper piping with cast and/or wrought copper fittings per ASTM B-88, 95/5 solder. Provide pipe supports at specified intervals with only copper-plated, copper or brass in contact with copper piping.

2.3.2 All drain piping shall be installed with a minimum fall of 1/8" per foot unless noted otherwise on plan.

2.3.3 The HVAC Subcontractor shall provide all drain piping required for or related to HVAC equipment whether indicated on plan or not. All termination points required, whether indicated on the plans or not, shall be provided by the Plumbing Subcontractor. Coordinate exact locations with the HVAC Subcontractor.

2.4 NATURAL GAS PIPING:

2.4.1 Provide a system of natural gas piping as shown on the plans. All gas piping within the building shall be run exposed unless specifically shown otherwise. Any gas piping concealed within the building shall be properly vented to the outside.

2.4.2 All gas piping shall be standard weight black steel pipe per ASTM A53. All intermediate and medium pressure pipe and all pipe larger than 2" shall be welded joints. Low pressure fittings 2" and smaller shall be standard weight black malleable iron screwed per ASTM A197. Intermediate and medium pressure fittings and fittings larger than 2" shall be "Tube-Turn" forged welding type, or approved equal. Screw thread joints shall be made with an approved compound, and shall comply with ANSI B1.20.1.

2.4.3 All underground piping shall have factory applied covering conforming to Republic "X-TRU-COAT" or General Paint Corporation Specification "TMA-2", and shall include the following layers: one coat of Biturine Enamel, one wrapping of felt, and a final wrapping of heavy kraft paper. Fittings and joints shall be treated and wrapped as specified above, in field, after lines have been tested.

2.4.4 Care shall be taken to keep the inside of piping dry and free of dirt, cutting burrs and other foreign substances. All threaded piping shall be reamed smooth after cutting, and shall be threaded with true, sharp dies to insure a proper joint make-up.

2.4.5 All equipment connections shall be preceded by a manual stop cock or ball valve, union and 12" drip leg.

2.4.6 Gas cocks 2" and smaller shall be all iron with brass square head plug; cocks larger than 2" shall be lubricated plug cocks, 150 psi wog. Gas ball valves shall be U.L. listed equal with Teflon seat, 150 psi wog.

2.4.7 Unions 2-1/2" and smaller shall be black malleable iron, ground joint, brass to iron seat unions. Unions 3" and larger shall be standard malleable iron gasket type flange unions with proper gasket.

2.4.8 All exposed gas piping, whether interior or exterior to the building, shall be painted with one coat of primer and two coats of black rust preventative paint. Primer and first coat of paint shall not be the same color. Piping exposed on the building exterior shall be painted with a coat to match the building finish.

2.4.9 Provide 17 point magnesium anodes by Standard Magnesium Corporation, located as indicated in an augured hole five feet from the pipe. The electrode wire shall be brazed or thermite welded to the pipe and coated with mastic. Provide a dielectric union at each location where the piping enters the building to electrically isolate the gas utility distribution system.

2.4.10 A DC voltage reading shall be made to test the effectiveness of the isolating unions. A minimum reading of 0.2 volts (measured across the union) shall be required. Repair or replace unions until this voltage can be obtained.

2.4.11 Underground gas piping, if approved by local code, may be yellow polyethylene plastic pipe per API 15LE and ASTM D2513, with fusion joints listed to PPI PE2708 in lieu of the wrapping black steel pipe.

2.4.12 Provide anodeless riser at building and meter for transition from polyethylene plastic pipe to above ground piping. Metal pipe shall have factory covering conforming to Republic "X-TRU-COAT".

2.4.13 Provide a lubricated plug cock and union in the inlet and discharge piping of each gas pressure regulator. Extend Schedule 40 threaded galvanized steel pipe vents from each interior regulator, and terminate through the roof with watertight flashing, gooseneck and birdscreen. Vents shall be the full size of the regulator vent connection and shall extend through the roof undiminished in size.

2.5 PIPING ACCESSORIES (GENERAL):

2.5.1 Flanges shall be slip-on or butt welding standard weight 1/16" raised face type with gaskets.

2.5.2 Unions shall be all bronze for copper systems and malleable iron with ground joint for steel piping systems. Provide dielectric unions for joining dissimilar metallic piping systems.

2.5.3 Weldolets and threadolets shall be steel per ANSI B16.9.

2.5.4 Escutcheons shall be single piece, set screw type, chrome plated and shall cover the opening and sleeve.

2.6 THERMOMETERS, PRESSURE GAUGES AND TEST PLUGS:

2.6.1 Provide thermometers and pressure gauges where shown on drawings and where required for testing and balancing system. The instruments shall be of the same manufacturer throughout.

2.6.2 Pipe thermometers <S> shall be adjustable angle type with separable socket. Thermometers shall have cast aluminum cases with baked enamel finish, red reading mercury tubes with black scale graduations, and glass covers. Scales shall be a minimum of 9 inches with appropriate ranges for indicating temperatures at least 25% above and below normal readings Sockets shall have stem length suitable for pipe receiving thermometer. Sockets on insulated pipes shall have lagging extensions of adequate length to clear insulation.

Acceptable manufacturers: Marsh, Trerice, Weksler

2.6.3 Pressure gauges <S> shall be bourdon tube with minimum accuracy 1.5% of full scale. Gauges shall have direct mounting aluminum cases, filled with glycerine-water mixture, not less than 4-1/2" dials, black scale graduations, and glass cover. Scales shall have a minimum arc of 260 degrees with appropriate ranges for indicting pressures at least 25% above normal operating range.

Gauges shall be installed with 1/4", 250 psi brass tee handle cocks, and filter type pressure snubbers. Provide pigtails for pressure gauges in steam service.

Acceptable manufacturers: March, Trerice, Weksler

2.6.4 Temperature and pressure test plugs shall consist of 1/4" MPT brass fittings with gaskets cap and Nordel core, rated for 1000 psi and 275 degrees F. The double valve self-sealing core shall be designed to receive a 1/8 inch O.D. temperature or pressure probe. Test plugs in insulated pipes shall be extended above insulation.

Acceptable manufacturers: Pete's Plumbing, R.E. Meyers TAP-110, Fairfax

2.6.5 Test gauges should consist of one thermometer and one pressure gauge with appropriate adapters for testing and balancing the system. Thermometer shall be externally adjustable with bi-metal element,

stainless steel case and stem, 1/2% accuracy, glass cover 0 to 220 degrees F scale, 6" stem, equal to Weksler type 2R06. Gauge shall be bourdon type with 3-1/2" dial, direct mounting aluminum case, 0 to 200 psi scale with black graduations, 1/2 percent accuracy, glass cover. Provide gauge adapter. After completion of project, the thermometer and pressure gauge with adapter will be left with the Owner.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION:

3.1.1 The piping systems required under the Plumbing division of these specifications shall be installed in a neat and workmanlike manner. All pipe hangers shall be of the type mentioned in this section and shall be so spaced and installed as to maintain a rigid piping system, adequately supported both laterally and vertically.

3.1.2 All domestic water piping systems shall be installed level and the low points of all risers shall have ball valves 1/2" in size installed with hose ends in order to adequately drain the system.

3.1.3 At each group of plumbing fixtures and at each piece of equipment, ball valves shall be furnished and installed by this Contractor so that these groups of fixtures or pieces of equipment may be isolated from accessible locations. Provide General Contractor with locations of all access doors. Access doors required for these valves shall be furnished by this Contractor.

3.1.4 Each of the piping systems shall be installed to provide for expansion and contraction and the joints shall be soldered at such time that the system is not under strain.

3.1.5 Necessary spring pieces and offsets shall be furnished by this Contractor as required.

3.1.6 Each of the piping systems shall be concealed in chases and above ceilings and in walls in all finished areas and shall be run exposed only as specifically specified or as shown on the drawings in machinery spaces or unfinished areas.

3.1.7 Exposed piping shall be held close to the walls and ceilings and necessary fittings shall be provided and installed to allow for offsets to hold the piping close to wall and ceilings. Where these lines run exposed a clearance shall be obtained from the Architect in writing before making the installation.

3.1.8 All valves shall be so located as to make the removal of their bonnets possible. All flanged valves shown in the horizontal positions shall be mounted with valve stem inclined one bolt hole above horizontal. All horizontal lines shall be "made-up" with valve stem inclined at an angle of thirty (30) degrees above the horizontal position. All valve stems must be true and straight at the time the system is tested for final acceptance.

3.1.9 Pipe shall be cut accurately to measurements established at the site and worked into place without springing or forcing.

3.1.10 Provide clearance for installation of insulation and for access to valves, air vents, drain and unions.

3.1.11 Provide a 1/2" thick foam plastic insulating sleeve-protector on all copper and plastic piping penetrations of concrete slab-on-grade prior to pouring of concrete.

3.1.12 Locate and suspend piping in such a manner so as to minimize transmission of vibration and noise.

3.1.13 All piping penetrations through fire rated ceilings, walls or floors shall be fire stopped using approved, UL listed materials to maintain the fire rating of the ceiling, wall or floor structure.

3.1.14 All piping connections to equipment and fixtures shall contain flanges or unions to allow easy removal whether or not shown on the plans.

3.1.15 Install a continuous length of tracer wire for the full length of each run of nonmetallic pipe installed underground. Attach wire to top of pipe in such manner that it will not be displaced during construction operations. Wire shall be solid #12 AWG copper with 30 mil HDPE insulation.

3.1.16 Air gaps for all indirect waste connections (open-site) shall be at least twice the effective drain piping diameter and in no case less than 2".

3.1.17 Vertical drain and relief piping that discharges into an indirect waste receptor shall be cut diagonally to reduce splashing. Horizontal piping shall include an elbow fitting.

3.2 PIPING JOINTS:

3.2.1 Screwed joints shall have full cut pipe threads. Joints shall be assembled with an approved compound applied to only the male threads. A minimum of three pipe threads shall remain exposed when the joint is assembled.

3.2.2 Welded pipe joints shall be fusion welded by a metallic arc welding process. The welding operations shall conform to the current recommendations of the American Welding Society. This Contractor's welder, employed on this project, shall have passed qualification tests as prescribed by the National Pipe Welding Bureau or other reputable testing laboratory using qualification procedures as recommended by the ASME Boiler Construction Code or American Welding Standards.

3.2.3 Mechanical coupling joints shall be assembled in strict accordance with the recommendations of the coupling joint manufacturer. The bolts, fasteners, gaskets and lubricants shall be a product of, or shall adhere rigidly to, the specification requirements of the joint manufacturer.

3.2.4 Solder joints shall be assembled with square cut pipe using a pipe cutter. Hack saw cut pipe ends shall be reamed to full size. Both the pipe and fittings shall be furnished absolutely clean. Brazing flux shall be applied to both the pipe and the fittings. The use of corrosive acid flux will not be permitted. During the brazing, the pipe and fittings must be charged with nitrogen gas. All components of the potable water system including piping, fittings, flux, solder, etc. shall meet NSF 61, and 372 requirements. The system shall be lead free.

3.2.5 See Paragraph 2.2 for cast-iron piping joints.

3.2.6 PVC Plastic pipe joints shall be assembled by applying NSF 61 and 372 approved all purpose purple primer and all purpose clear solvent or approved equal. PVC primer and solvent cement shall be applied to both the pipe and fittings in accordance with the manufacturer's recommendations. Join the pipe and fittings to completely set the pipe within the fitting and rotate the pipe within the fitting one-half revolution to evenly distribute the solvent cement.

3.3 SECURING AND SUPPORTING OF PIPE:

3.3.1 All pipe shall be supported from the building structure by means of approved hangers and supports. Piping shall be supported to maintain required grade and pitch, prevent vibration and provide for expansion/contraction.

3.3.2 All hangers shall be secured to approved inserts wherever possible and practicable. Hanger inserts shall be set in place before concrete is poured. Where hangers attach to the structural steel framing, approved beam clamps shall be employed. Where required, the Mechanical Subcontractor shall install channels to span between framing members. In no case shall spacing of hangers for horizontal piping be greater than indicated on the following schedule:

FERROUS (SCHEDULE 40) PIPING

NOMINAL PIPE SIZE (MAXIMUM)	HANGER SPACING
1/2"	5'-0"
3/4"	6'-0"
1"	7'-0"
1-1/2"	8'-0"
2" and larger	10'-0"

COPPER PIPING/TUBING

NOMINAL PIPE SIZE (MAXIMUM)	HANGER SPACING
Up to 1-1/4"	6'-0"
1-1/2" and larger	8'-0"

PLASTIC (PVC) PIPING

NOMINAL PIPE SIZE (MAXIMUM)	HANGER SPACING
All pipe sizes	4'-0"

CAST IRON PIPING

NOMINAL PIPE SIZE (MAXIMUM)	HANGER SPACING
All pipe sizes	one hanger per length of pipe and not exceeding 5'-0" intervals

3.3.3 Vertical lines shall be adequately supported at their bases, either by a suitable hanger placed in the horizontal line near the riser, or by a base fitting set on a pedestal or foundation and from each floor slab by means of approved clamp type support bearing on the slab or beam. In no case shall the spacing of supports for vertical piping be greater than indicated on the following schedule:

FERROUS (SCHEDULE 40) PIPING

NOMINAL PIPE SIZE (MAXIMUM)	SUPPORT SPACING
All pipe sizes	At the base and at each story level, not exceeding 30'-0" intervals

COPPER PIPING/TUBING

NOMINAL PIPE SIZE (MAXIMUM)	SUPPORT SPACING
Up to 1-1/4"	4'-0"
1-1/2" and larger	At the base and at each story level, not exceeding 15'-0" intervals

PLASTIC (PVC) PIPING

NOMINAL PIPE SIZE (MAXIMUM)	SUPPORT SPACING
Up to 1-1/2"	4'-0"
2" and larger	At the base and at each story level, not exceeding 20'-0" levels

CAST IRON PIPING

NOMINAL PIPE SIZE (MAXIMUM)	SUPPORT SPACING
All pipe sizes	At the base and at each story level, not exceeding 15'-0" intervals

3.3.4 Hangers for piping 2" and smaller shall be of the split cast ring type with fastening device. Hangers for piping larger than 2" shall be of the adjustable clevis hanger type. Hanger rods shall be minimum 3/8" diameter and shall have machine threads. Brackets of approved type may be used along walls. Hanger rods for individually suspended horizontal pipes shall be steel rods of size indicated on the following table:

NOMINAL PIPE SIZE (MAXIMUM)	ROD SIZE
1/2" to 2"	3/8"
2-1/2" to 3"	1/2"
4"	5/8"

3.3.5 Hangers for use with copper piping shall be copper plated ferrous sizes for copper tubing.

3.3.6 Hangers shall be installed within 2'-0" of each change in direction, either vertical or horizontal, or pipe tee and on each side of valves, strainers, etc.

3.3.7 Multiple horizontal pipes, smaller than 12" diameter pipe, may be supported on trapeze hangers. Trapeze spacing shall be in accordance with the schedule for pipe spacing based upon the smallest pipe. The trapeze members shall be properly sized for the piping load they are to support.

3.3.8 Where "cold" pipes are insulated with a vapor sealing jacket, the hanger shall be oversized accordingly to accommodate the outside diameter of the insulation, and half-round 16 gauge galvanized steel shields, not less than 14" long, rolled to fit the insulation diameter, shall be provided between the insulation and the hanger.

3.3.9 Pipe supports shall be as manufactured by Mapa, Miro, Grinnell/Tyco, Pipe Supports Group, Anvil, or prior-approved equal.

3.4 SCHEDULE OF PLUMBING BRANCHES:

The size of branches or runouts to each fixture shall be as indicated on the drawings. Where no size of connection is indicated, connection shall be not less than in accordance with the following schedule or local plumbing code:

Fixture	Waste	Vent	C.W.	H.W.
Water Closets	4"	3"	1/2"	---
Lavatories	1 1/4"	1 1/2"	1/2"	1/2"
Service Sinks	3"	2"	1/2"	1/2"
Floor Drains	3"	2"	---	---
Wall Faucets	---	---	3/4"	---

3.5 EQUIPMENT PLUMBING CONNECTIONS:

3.5.1 The Plumbing Subcontractor shall rough-in for connections to all miscellaneous equipment noted on the drawings. Final connections to the equipment shall be a part of this contract.

3.5.2 The Plumbing Subcontractor shall make final connections to all pieces of equipment including owner furnished equipment that require water, drain, waste or vent connections, furnishing all required shutoff cocks, valves, drain valves and traps and in accordance with the equipment manufacturer's recommendations.

3.6 GAS PIPING TESTING:

Gas piping shall be tested in strict accordance with NFPA 54.

3.7 TESTING REQUIREMENTS:

Refer to section 22 09 00 for further testing requirements.

END OF SECTION

SECTION 22 07 00 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 GENERAL:

1.1.1. Refer to Section 22 05 00 for Common Work Results for Plumbing.

1.2 SCOPE:

The Contractor shall cover all piping and apparatuses, as specified below, with insulation as manufactured by Manville, Owens-Corning or equal. All insulation, jacket, facing and adhesive shall have composite ratings not exceeding flame spread of 25 and smoke development of 50.

PART 2 - PRODUCTS

2.1 DOMESTIC WATER PIPING:

All cold water piping, hot water piping and hot water recirculating piping above grade shall be insulated with molded fiberglass mitered to fit the piping. This insulation material shall be furnished with a "Universal" white vapor barrier jacket with flap. All jacket materials shall be factory applied. Provide manufactured rigid fitting covers. Insulation thickness shall be as follows:

Service	Pipe Size Less than 1.5"	Pipe Size 1.5" and greater
Cold Water	1.0"	1.0"
Hot Water	1.0"	1.5"
Hot Water Return	1.0"	1.0"

2.2 ALUMINUM METAL JACKET:

All insulation outside, exposed to weather shall be covered with 0.024" aluminum metal jacket.

PART 3 - EXECUTION

3.1 PROCEDURES:

3.1.1 All insulation shall be the product of reputable manufacturers and shall be applied by mechanics skilled in the use of various materials and in the employ of a concern regularly engaged in the insulating business. The materials shall all be applied in accordance with the published standards of the manufacturer of the materials, using any special materials as required by these specifications and by those published standards. Unsightly work shall be just cause for rejection.

3.1.2 All sectional covering shall finish round and smooth, without lumps or depressions and all end and joints shall butt evenly and tightly together and to the covered surface. No broken or damaged section shall be used. When covering is formed from blocks, they shall be carefully and evenly applied, securely wired in place and joints shall be closed with cement insulation.

3.1.3 In instances where insulated lines pass into other areas, wherein the line will not be insulated as described herein, the insulation shall not terminate at the wall, but shall extend full size a minimum of 1" beyond the wall.

3.1.4 Engage the services of a qualified insulation applicator to furnish and install all the insulation required for the mechanical equipment, piping, etc., specified herein.

3.1.5 All surfaces to be insulated shall be clean and dry before applying insulation. All sections of molded pipe covering shall be firmly butted together. No insulation shall be applied until the pipe, duct, etc., have

been pressure tested and found tight. Piping flexible connections, flanges and unions shall not be covered unless specifically noted.

3.1.6 Prior to the installation of any insulating material to ferrous piping systems, the piping surfaces shall be thoroughly cleaned of all mill scale, grease and dirt and shall be given a coat of rust inhibiting primer.

3.1.7 At all valves, unions, flanges, etc. insulation shall be beveled or tapered to the surface being insulated. Insulation ends shall then be sealed vapor-tight with mastic.

3.1.8 Where vapor barriers are required, the vapor barrier shall be on the outside. Extreme care shall be taken that the vapor barrier is unbroken. Joints, etc., shall all be sealed. Where insulation with a vapor barrier terminates, it shall be sealed off with the vapor barrier being tapered continuous to the surface being insulated. Ends shall not be left raw.

END OF SECTION

SECTION 22 09 00 - CLEANING AND TESTING FOR PLUMBING SYSTEMS

PART 1 - GENERAL

1.1 GENERAL:

Refer to Section 22 05 00 for Common Work Results for Plumbing.

1.2 SCOPE:

1.2.1 This Contractor shall, at his own expense, during the progress of the work or upon its completion, make such tests of his work as are herein specified in accordance with all laws, governing authorities, or as are required by Architect or by state or municipal bureaus having jurisdiction and under their supervision. The Contractor shall provide all apparatus, temporary piping connections or any other requirements necessary for such tests. He shall take all due precautions to prevent damage to building or its contents incurred by such tests, as he will be required to repair and make good, at his own expense, any damage so caused. Any leaks, defects or deficiencies discovered as a result of the tests shall be immediately repaired or made good and test shall be repeated until the test requirements are fully complied with. No caulking of pipe joints to remedy leaks will be permitted.

1.2.2 No work of any nature shall be covered, enclosed or otherwise concealed until properly inspected, tested and approved. Any leaks which develop during any of the tests shall be corrected with new material and made as good as required; said tests shall be repeated until the work is satisfactory to Architect and the mechanical inspectors in every way.

1.2.3 Each separate system with its various components shall be operated by this Contractor for a reasonable length of time to demonstrate the performance of all equipment and piping in accordance with the true intent and purpose of the plans and specifications. All necessary adjustments shall be made to the satisfaction of the Architect.

1.2.4 All motor driven equipment shall be proved operable generally in accordance with the intent of these specifications.

1.2.5 All electrical power for testing of the plumbing systems shall be provided by the General Contractor and coordinated by this Contractor prior to bid. All water and drainage required for testing of the plumbing systems shall be provided by this Contractor.

PART 2 - PRODUCTS

2.1 STERILIZATION MATERIALS:

Domestic water sterilization solutions shall contain not less than 50 parts per million of available chlorine. The chlorinating materials shall be either liquid chlorine, conforming to U. S. Army Specification Number 4-1, or calcium hypochlorite or chlorinated lime conforming to the requirements of Federal Specification 0-C-114.

PART 3 - EXECUTION

3.1 TESTING AND ADJUSTING:

3.1.1 Water Piping System: Water piping systems shall be properly tested to a hydrostatic pressure of one hundred and fifty pounds per square inch gauge (150 psi) for a period of not less than eight hours. During this test period, all leaks in pipe, fittings and accessories, and in the particular piping system, which is being tested, shall be stopped and the hydrostatic test shall again be applied. This procedure shall be repeated for an entire eight hour period and no leaks can be found while the system being tested is subject to the pressure mentioned above.

Sanitary Drains: Pipe shall have all outlets temporarily plugged. The pipes shall be filled with water testing the system in sections such that no section shall be tested with less than 10 foot (10') head of water. If after twenty-four (24) hours, the level of the water has been lowered by leakage, the leaks must be found and stopped by this Contractor, and the water level shall again be raised and the test repeated until after twenty-four hour retention period there shall be no perceptible lowering of the water level of the system being tested.

3.2 STERILIZATION:

3.2.1 After completion of the testing, the entire domestic cold and hot water piping systems with attached equipment shall be thoroughly sterilized with a solution containing not less than 50 parts per million of available chlorine as described above. The chlorinating materials shall be pumped into the system through the connection described below. The sterilization solution shall be allowed to remain in the system for a period of eight (8) hours, during which time all valves and faucets shall be opened and closed several times. After sterilization, the solution shall be flushed from the system with clean water until the residual chlorine content is not greater than 0.2 parts per million. The exact procedure actually used shall meet or exceed local code requirements.

3.2.2 The sterilization solution shall be introduced into the water system through a 3/4" opening to be provided in the water main on the building side of the water meter.

3.2.3 The sterilization process shall be conducted under the direction of the local health department and upon completion of the process, the health department shall test and verify the cleanliness of the water piping system. Sterilization shall comply with NSF 60.

END OF SECTION 22 09 00

SECTION 22 40 00 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 GENERAL:

Refer to Section 22 05 00 for Common Work Results for Plumbing.

1.2 SCOPE:

1.2.1 Provide and install all labor, materials, equipment, tools and services and perform all operations required in connection with or properly incidental to the installation of complete plumbing fixtures and plumbing equipment, as indicated on the drawings, reasonably implied therefrom, or as specified herein, unless specifically excluded.

1.2.2 Plumbing fixtures shall be supplied, set and connected as listed herein and as shown on the drawings. Fixtures shall be protected from damage during construction and shall be thoroughly cleaned of all tape and adhesive prior to final acceptance.

1.2.3 Special mounting heights of plumbing fixtures shall be coordinated with architectural details of each toilet area.

1.3 SUBMITTALS:

Submittals are required as indicated.

1.4 REFERENCED STANDARDS:

International Plumbing Code (IFC)
City of Alexandria Plumbing Code and Ordinances
Louisiana State Plumbing Code
ADA Part II 36 CFR Part 1191 & Part III 28 CFR Part 36
Energy Policy Act of 1992, HR776
Louisiana Sanitary Code

PART 2 - PRODUCTS

2.1 FITTINGS AND PIPES:

2.1.1 Fittings and piping in connection with plumbing fixtures shall be brass and, wherever exposed, shall be polished, chrome-plated. Provide tight fitting wall or floor escutcheons of chrome-plated brass wherever pipes pass through walls, floors and ceilings.

2.1.2 Provide and install all required water, waste, soil and vent connections to all plumbing fixtures and equipment, together with all fittings, supports, fastening devices, cocks, valves, traps, etc., leaving all in complete working order.

2.2 FIXTURES:

2.2.1 All plumbing fixtures shall be new, first quality, free from marks or chips and shall be provided with sufficient support in order to adequately hang each and every unit. Insofar as is possible, all fixtures shall be by the same manufacturer (i.e., water closets, lavatories, etc.). Lavatories, sinks, etc. shall be provided with trim and accessories by the same manufacturer.

2.2.2 Each and every unit shall be complete with all required trim and all exposed piping and trim shall be polished chrome-plated, all brass. Each and every fixture shall be provided with keyed stop valves whether specifically shown and/or specified or not, and all such keyed stop valves shall have a metal-to-metal seat.

2.2.3 Each piece of trim, supply fittings, etc., shall be provided whether correctly specified or not in order to securely fit the fixture involved to the particular roughing-in available.

2.3 PLUMBING FIXTURES: <S>

2.3.1 Water Closet, Handicapped (WCHA) – Kohler Highline K-3493 or American Standard Cadet Right Height 2377.10, vitreous china, tank type, floor mounted, pressure-assisted operating system, elongated bowl. Provide Bemis 1955c or Beneke 533 elongated open front white seat with check hinge, less cover. Water closet shall be provided with angle supply and stop, pressure-lite tank system, polished chrome trip lever, white plastic snap-on bolt caps, tank and tank cover. Handicapped height. Connection sizes: CW =1/2", WD = 1/2".

2.3.2 Urinal, Handicapped (URH) - Kohler Bardon Superior K-4960-ET or American Standard Washbrook 6501.010, vitreous china, wall hung, washout, 3/4" top spud, 14" elongated rim urinal with integral trap, 1.0 gallons per flush. Provide Sloan or Zurn mid-level manual flush valve with synthetic diaphragm and dual filtered bypass, and Josam 17560-UR or Wade 400-AM11 carrier. Connection sizes: CW = 3/4", WD = 2". Adult handicapped height.

2.3.3 Lavatory, Handicapped (LH) – Kohler Greenwich K-2030 or American Standard Lucerne 0356.015, 20-1/2" x 18-1/4", vitreous china, wall-hung lavatory with backsplash, 8" centers, and front overflow. Provide American Standard Heritage 4800.372h or Chicago 404-317CP trim with 4" wrist blade handles with red and blue indexes, 1.5 gpm pressure-compensating aerator, reinforced flexible hose connections and nsf 61/372 lead free compliance. Provide lead fee supply stops with cross handles and rigid risers, chrome-plated brass p-trap, and offset grid drain, Mifab or Wade wall carrier, and lav guard ADA pipe covers. Connections sizes: CW = 1/2", HW = 1/2", WD = 1-1/4". Reference architectural plans for mounting height. Adult handicapped height.

2.3.4 Accessible Counter Sink (KSH) - 25" x 21" x 6-1/2" deep type 304 stainless steel, 18 gauge single compartment sink with keyed angle stops, flexible risers, coated underside, and 3-hole drilling. Provide offset drain with duo-strainer, C.P.B. P-Trap, trim with hi-arc gooseneck spout and 4" wrist blade handles, and white insulation kit. Connection sizes: CW = 1/2", HW = 1/2", WD = 1-1/2".

2.3.5 Accessible Counter Sink (SK) - 22" x 19" x 6-1/2" deep type 304 stainless steel, 18 gauge single compartment sink with keyed angle stops, flexible risers, coated underside, and 3-hole drilling. Provide trim with hi-arc swing gooseneck spout, and 4" wrist blade handles, offset drain with duo-strainer, C.P.B.P-Trap, and white insulation kit. Connections sizes: CW = 1/2", HW = 1/2", WD = 1-1/2".

2.3.6 Service/Mop Sink (MS) – Enameled cast-iron wall hung janitor sink with stainless steel rim guard, wall hanger supports, 2" trap with cleanout plug at strainer, polished chrome faucet with vacuum breaker, angle wall support and integral service stops. Provide with hose/hook, and wall mop hanger. Connection sizes: CW = 1/2", HW = 1/2", WD = 3".

2.3.7 Commercial Electric Water Heater (WH-3) - 40 gallon short model, 4.5kw dual element, non-simultaneous operation, 208v/1ø, 18 gph recovery at 100ºF rise. Provide ASME T&P relief valve with 80 psi setpoint, expansion tank, and heat trap as required. Connection sizes: CW = 1", HW = 1".

2.3.8 Point-of-Source Mixing Valve (MV) - point-of-source mixing valve, 0.5 gpm minimum flow, solid bronze construction, paraffin-based actuation technology, integral check stops and inlet screens, adjustable temperature section with lockdown, cast bronze body w/ union connection and 1" inlets and outlet. Mount above ceiling/inside wall behind removable ceiling tile or access door.

2.3.9 Hot Water Circulator (HWC) - Grundfos UP25-64SF centrifugal in-line pump, all bronze, 1/12 HP, 115V/1 phase, 11 GPM at 9 ft. HD., flanged 3/4" connections. Provide time clock for on/off programming of recirculating pump and water heater(s) as required by ASHRAE 90.1-2004/International Energy Conservation Code. Time clock shall be equal to Intermatic ET1100 series with 7-day programming capability, 16 setpoint availability, and lockable steel enclosure.

2.3.10 Floor Drain (FD) - Wade or Josam floor drain with cast iron body, satin nickel bronze 8”x8” square strainer, 1/2" trap primer tapping, and vandal proof screws.

2.3.11 Trap Guard (TG) – Elastomeric, normally closed drop-in device to prevent evaporation of the trap seal; opens with fluid; size as applicable per plans.

2.3.12 Freezeless Wall Box Faucet (WF) – Freezeless, automatic draining, backflow preventer, flush wall box with keyed door, chrome plated brass, loose tee key.

2.3.13 Trap Primer (TP) – Water Saver lavatory/sink trap primer set with C.P.B. P-trap, escutcheons, 1/2" stainless steel primer tube, and compression fitting connection at wall.

2.3.14 Hi/Lo Electric Water Cooler, Handicapped (EWCH) – Elkay or Halsey Taylor two-level wall hung electric water cooler with stainless steel construction, factory-installed bottle filler and full stainless steel lower shroud, 8.0 GPH, 1/5 HP, 120V, 575 watts, keyed rough stop supply, C.P.B. P-Trap, cane touch apron, and Josam 17560-WCBL or Wade 440-AM11 carrier. Handicapped height. Connection sizes: CW = 1/2", WD = 1-1/4".

Acceptable Manufacturers:

Water Closets, Urinals, Lavatories - Kohler, American Standard, Sloan, Zurn.

Flush Valves – Zurn, Sloan, Delaney.

Carriers – Wade, Zurn, Jay R. Smith, Watts, Mifab.

Sinks - Kohler, American Standard, Just, Elkay.

Lavatory/Sink Accessories (excluding faucets) - Zurn, McGuire, Dearborn, Brasscraft.

Faucets and Trim - Kohler, American Standard, Elkay, Chicago, Zurn, Sloan, Speakman, Delta Commercial.

Electric Water Coolers - Elkay, Halsey-Taylor, Oasis, Haws, Acorn.

Wall Faucets, Hose Bibbs - Woodford, Wade, Jay R. Smith, Zurn, Watts, Mifab.

Floor Drains, Roof Drains, Cleanouts - Wade, Jay R. Smith, Zurn, Watts, Mifab.

Insulation Kits - Truebro, Plumberex.

Sealed Combustion Water Heaters – A.O. Smith, Rheem-Ruud, Lochinvar, State.

Lavatory Systems – Acorn, Bradley.

2.4 CLEANOUTS: <S>

2.4.1 CLEANOUTS SHALL BE AS FOLLOWS:

Floor Cleanouts - in finished areas:		Wade #W-6000 or Josam 56000-96-Y with satin nickel bronze top with bronze plug.
	- in tile floors:	Wade #W-6000-T or Josam 5600012-96-Y with bronze plug.
	- in terrazzo floors:	Wade #W-6000-U or Josam 56040-1-96-Y with bronze plug.
	- in unfinished utility or storage areas:	Wade #W-8550-D or Josam 58500-22-96 with bronze plug.

Wall Cleanouts - Wade #W-8480R or Josam 58610 Stainless Steel coverplate with bronze plug.
Cleanouts in exposed piping - Wade #W-8550-R or Josam 58500-96 with bronze plug.

Exterior Cleanouts - Wade #W-6000-X-5 or Josam 56070-1-15 with heavy-duty nickel bronze top and bronze plug.

2.4.2 Cleanouts in waterproof floor shall have flashing flange and clamping device.

2.4.3 Cleanouts in carpeted areas shall be provided with carpet markers (Wade option No. 72).

2.5 FLOOR DRAINS: <S>

2.5.1 Provide floor drains where indicated on drawings. Drains shall be cast iron construction, with satin nickel bronze strainers and vandal proof hardware.

2.5.2 Strainer sizes shall be as follows: 8”x 8” square on 3" and 4" drain.

2.5.3 A deep seal, cast iron P-trap shall be installed on each drain connected to the sanitary sewer system.

2.5.4 Drains in waterproof floors shall have flashing flange and clamping device.

2.6 WATER HAMMER CONTROL: <S> <OM>

2.6.1 Arrestors shall be sized and applied in accordance with the Plumbing and Drainage Institute Standard PDI-WH-201. Equipment shall be Wade Shockstop, Sioux Chief Hydra-Rester or equal by Amtrol, Zurn, Josam, or Precision Plumbing Products.

2.6.2 Provide access panel in wall to service water hammer arrestors.

2.7 VACUUM BREAKERS: <S> <OM>

2.7.1 For hose bibb and wall faucets: Woodford #34H or equal.

2.7.2 For water heaters without dip tubes: Watts #288A or equal.

2.8 DOMESTIC WATER HEATERS: <S> <OM>

2.8.1 Electric water heaters shall be UL listed and complete with all standard features, three (3) year tank warranty for commercial applications, glass-lined tank, foam insulation on the tank, anode rod, automatic temperature control, automatic high-limit safety cutoff, and 98% efficient copper sheathed tin coated immersion type heating elements.

2.8.2 Each water heater shall be provided with an ASME pressure and temperature relief valve. Units not installed with vacuum breaker on cold water supply line shall be provided with AGA certified vacuum relief

valve per ANSI Z21.22. A gate valve shall be installed on same floor as unit and no further than 3 feet on the cold water supply.

2.9 DOMESTIC HOT WATER CIRCULATORS: <S> <OM>

Hot water circulating pumps shall be manufactured by Bell and Gossett, Taco or Grundfos and shall have capacities as scheduled on the drawings. The pumps shall be all bronze construction and shall be provided complete with a manual motor starter equal to Square "D" Class 2510.

PART 3 - EXECUTION

3.1 INSTALLATION:

3.1.1 Plumbing fixtures and equipment shall be set in place, leveled and connected as indicated on the drawings. Fixtures shall be protected from damage during construction and shall be thoroughly cleaned of all tape and adhesive prior to final acceptance.

3.1.2 Verify exact location and mounting height of wall hung handicapped fixtures with architectural drawings before roughing-in.

3.1.3 Contractor shall set and connect all fixtures, including fixtures and equipment provided by others, in strict accordance with the manufacturer's printed instructions and applicable industry standards as indicated.

3.1.4 Caulk around all plumbing fixtures with fine continuous bead of white silicon sealant.

3.1.5 Supplies to each fixture or piece of equipment shall be valved for service.

3.1.6 All drains shall be trapped and vented.
3.1.7 Connection between china and soil pipe flanges shall be made gas and water-tight with one-piece molded gasket.

3.1.8 Do not install aerators on faucets until system has been flushed out and sterilized.

3.1.9 Provide white plastic snap-on bolt caps for all water closet mounting studs.

3.1.10 Reference architectural drawings and interior elevations for plumbing fixture mounting heights and installation arrangement prior to order, rough-in and installation.

3.1.11 Flush valve handles for handicapped accessible water closets shall be installed on the wide side of each toilet stall/room. Coordinate water closet rough-in such that tank and top does not interfere with grab bar installation.

3.2 PUMP INSTALLATION:

A. General: Comply with the manufacturer's written installation and alignment instructions.

B. Install pumps in locations and arrange to provide access for periodic maintenance, including removal of motors, impellers, couplings, and accessories.

C. Support pumps and piping separately so that the weight of the piping system does not rest on the pump.

3.3 PUMP CONNECTIONS:

A. General: Install valves that are same size as the piping connecting the pump.

B. Install suction and discharge pipe sizes equal to or greater than the diameter of the pump nozzles.

C. Install a nonslam check valve, shut off valve, and liquid-filled pressure gauge on the discharge side of pumps.

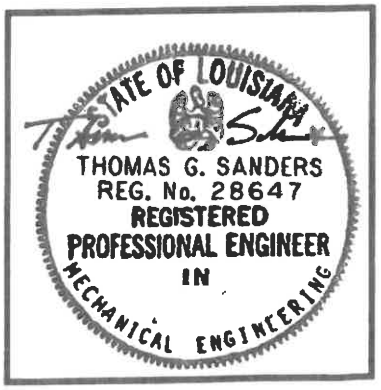
D. Install a shut off valve, strainer, butterfly balancing valve and liquid-filled pressure gauge on the suction side of inline pumps.

E. Install flexible connectors on the suction and discharge side of each pump. Install flexible connectors between the pump casing and the discharge valves and upstream from the pump suction diffuser.

F. Install T & P test ports in suction and discharge piping around pump.

END OF SECTION

DIVISION 23
MECHANICAL



SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SCOPE:

The scope of the mechanical phase of this project shall include all labor, materials, equipment, etc., required to fulfill the intent of the Contract Documents and shall include the work specified under the subsequent sections of Division 23 of these specifications.

1.2 RELATED DOCUMENTS:

All applicable provisions of Divisions 0 and 1 govern work under this Division. Refer to these articles in the specifications for additional information.

1.3 SUBMITTALS:

1.3.1 All work shall be performed in full accord with the latest editions of the applicable state, and national building codes and local ordinances.

1.3.2 Refer to each section for applicable codes and reference standards.

1.4 FEES, PERMITS AND TAXES:

This Contractor shall make arrangements for and pay for all inspection fees, connection fees and permits required by local authorities. The Contractor shall also pay all taxes levied for labor and materials associated with work under this Division.

1.5 SUBMITTALS:

1.5.1 The symbol "<S>" indicates a requirement for submittals.

1.5.2 Refer to Architectural specifications for additional information on submittals.

1.5.3 Refer to AIA General Conditions.

1.5.4 In addition to the requirements of the above referenced portions of this specification, all Subcontractors proposing to do work under this Division shall comply with the following additional requirements:

A. These specifications and drawings are intended to indicate a standard of quality for materials and equipment which is established by the listing of manufacturer's names and catalog numbers and/or by referenced standards. Materials and equipment that do not comply with these standards of quality will not be considered for substitution.

B. As soon as practicable and within thirty (30) days after the award of the contract and before beginning the fabrication of any material or the installation of any equipment, data shall be submitted for approval on equipment and materials where noted. Materials (pipe, fittings, etc.) may be listed with the name of the manufacturer and identifying catalogue numbers. Data for equipment shall include manufacturer's name, catalog data, diagrams, drawings and other descriptive data as required or requested by the Architect for evaluation.

C. Notwithstanding any reference in the specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalogue number, such references shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product

material, fixture, form or type of construction which in the judgment of the Architect expressed in writing, is equal to that specified.

D. All data shall be carefully examined and shall be forwarded for approval with a signed certification to the effect that the data has been carefully checked and found to be correct with respect to dimensions and available space and that the equipment complies with all requirements of the specifications.

E. Point out in writing all deviations between the plans and specifications and the materials submitted.

F. It is understood that proof of equality is the responsibility of the Contractor and/or supplier and that it is not the responsibility of the Architect to prove the inequality of the proposed substitutions. Furthermore the decisions of the Architect are final.

1.5.5 While it is not the intention of the Architect to discriminate against any manufacturer of equipment which is equal to specified equipment, a strict interpretation of such equality will be exercised by the Architect in considering any equipment offered as a substitute for equipment named in the specification. It shall be the responsibility of the Contractor to submit with each request for approval of substitute material or equipment, sufficient data to show conclusively that it is equal to the material or equipment specified.

1.5.6 Each Contractor shall submit shop drawings and/or diagrams for approval and for job coordination in all cases where significant deviations from the contract drawings are contemplated because of job conditions, interferences, or substitutions of equipment, or when requested by the Architect for purposes of clarification of the Contractor's intent. He shall also submit detailed shop drawings, rough-in sheets, etc., for all special or custom built items of equipment.

1.5.7 Submittal of shop drawings shall be made in sufficient quantities to provide one (1) copy of all data to be retained by the Engineer; two (2) copies of all data to be accumulated for the Owner; one (1) copy of all data to be retained by the Contractor; one (1) copy of all data to be retained by the Architect.

1.5.8 Should any substitute items be submitted and disapproved, then those items must be furnished exactly as described herein.

1.5.9 The Architect's review of shop drawings and/or submittal data shall not relieve the Contractor of responsibility for deviations from the contract drawings or specifications.

1.5.10 The size of mechanical equipment shown on the drawings is based on the dimensions of a particular manufacturer. While other manufacturers may be acceptable, it is the responsibility of the Contractor to determine if the equipment he proposes to furnish will fit in the space. Shop drawings shall be prepared when required by the Architect/Engineer or Owner to indicate a suitable arrangement.

1.5.11 Prior to ordering any equipment, the contractor shall furnish to the electrical contractor an itemized list of all equipment, motors, actuators, etc. requiring electrical power. The list shall include the item and it's location, voltage, phase, horsepower and amperage. A copy of the list shall be submitted to the architect.

1.6 PRIOR APPROVAL:

Where the contractor wishes to substitute equipment or materials under an "or equal" clause, he shall submit via U.S. Mail or hand delivery to the Architect in written hard copy form seven (7) work days prior to bid opening lists of proposed substitutions which, from published manufacturer's data, cover the salient features of the proposed substitution. Contractor shall indicate in writing all differences between specified equipment or materials and proposed substitution. Approvals will be issued in writing by addendum.

1.7 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS:

1.7.1 The symbol "<OM>" indicates a requirement for operating and maintenance manuals to be furnished.

1.7.2 The Owner's operating personnel shall be instructed by the Contractor on how to start and operate each item of equipment. Safety features shall be pointed out, particularly the possible troubles which might cause the safety controls to operate and what might be done to remedy the trouble.

1.7.3 The Owner's operating personnel shall be thoroughly instructed in the operation of the control system. Instructions should include an explanation of the control system or system sequence of operation, the proper set points of each thermostat, etc., and how to change the settings to accommodate overheating and overcooling, or incorrect humidity. Instructions shall include an explanation of components which should not be tampered with or control settings which should not be changed except by authorized personnel of the Control Manufacturer. Thermostat keys shall be turned over to the Owner.

1.7.4 Relative to the air conditioning system, instruct the Owner's operating personnel in the following:

A. Removal of service access panels from equipment. If special tools are required, turn over to the Owner at least one set.

B. Method of removing air filters.

C. Location of concealed valves, traps, air splitters, automatic dampers, etc., requiring periodic maintenance and location of access to them.

1.7.5 Provide (4) four copies of operating and maintenance manuals. Manuals shall be bound in large ring, loose-leaf binders and contain the following:

A. Manufacturer's instructions and/or installation manual.

B. Manufacturer's service manual.

C. Manufacturer's lubrication chart listing types of lubricant to be used on each item of equipment and recommended frequency of lubrication.

D. Electrical diagrams of each equipment "packaged" control system.

E. Parts lists and identifying part numbers with prices of each part. The name and address of the nearest distributor from which parts can be obtained.

1.8 WARRANTY:

This contractor shall warrant all workmanship, material, equipment systems, etc., provided by him for a period of one year after substantial completion of the project. This warranty means that this contractor shall make good to the Owner, at no cost, any defects that become apparent during the year following substantial completion. This warranty is in addition to any other guarantees or warranties and is not intended to limit such other guarantees or warranties.

1.9 DEFINITIONS: The following words and phrases as used herein are hereby defined:

1.9.1 "provide": Furnish and install all material and labor required for a complete installation ready for operation in accordance with the intent of the Contract Documents.

1.9.2 "as required": Indicates that the Contractor shall perform the work or provide the material as indicated in accordance with manufacturer's installation instructions; and in accordance with applicable codes or regulations; and in a workmanlike manner as defined by good local practice.

1.9.3 "or equal": Indicates that the Contractor may substitute equipment by another manufacturer if the salient features of the equipment indicated by manufacturer's name and/or described are, in the judgment of the Architect, adequate. Submittals for approval are required where indicated.

1.9.4 "contractor": Where the word(s) "Contractor" or "this Contractor" is/are used, they refer to the Contractor engaged to execute the work under this division of the specifications only, even though he may be technically described as a sub-contractor.

1.9.5 "intent of the Contract Documents": The specific intent of these documents is to provide to the Owner, in a thoroughly functional condition, all the various systems, equipment, etc., indicated herein. Final authority over interpretation of the "intent" shall rest with the Architect.

1.9.6 "shall": Indicates a mandatory requirement.

1.10 INSPECTION OF THE SITE:

1.10.1 The drawings are prepared from the best information available and reflect all conditions commensurate with this information. However, the contractor should visit the site prior to submitting a proposal and should verify the locations, sizes, depths, pressures, etc., of all existing utilities and familiarize himself with working conditions, hazards, existing grades, soil conditions, obstructions, etc. If it becomes evident that existing site conditions will impair the proper operation of the utilities, the Architect should be notified in writing.

1.10.2 All proposals shall take these existing conditions and any revisions required into consideration.

1.11 CONSTRUCTION REQUIREMENTS:

1.11.1 The Contractor shall be responsible for fitting his material and apparatus into the building and shall carefully lay out his work at the site to conform to the structural conditions, to provide proper grading of lines, to avoid all obstructions and to conform to the details of the installation supplied by the manufacturer of the equipment to be installed. Furnish all necessary pilot lines and control lines whether indicated on the drawings or not. The drawings do not give exact details as to elevations of pipe lines nor do they show exact locations of pipe to scale. Piping elevations shall be handled by giving precedence to pipes which require a stated grade for proper operation. Devices necessary for installation and support of pipes, and equipment (such as sleeves, inserts, etc.) shall be located and installed as the construction progresses in order to allow completion of each phase of the work in the proper sequence.

1.11.2 Drawings showing the extent and arrangement of the work of a particular trade shall be used together with drawings showing extent and arrangement of work of other trades to insure that the Contractor in laying out and installing his work shall do so in a manner such that the work of the several trades may progress in the most direct, workmanlike and harmonious manner.

1.11.3 The Contractor shall be responsible for the proper location and size of slots, holes or openings in the building structure pertaining to his work, and for the correct location of pipe sleeves. The drawings indicate the extent and general arrangement of the various systems, but if any departures from these drawings are deemed necessary by the contractor, detailed drawings and descriptions of these departures and a statement of the reasons therefore shall be submitted to the Architect as soon as practicable. No departures from the arrangements shown on the drawings shall be made without prior written approval of Architect.

1.11.4 In general, piping and ductwork in finished areas of the building shall be run concealed unless noted and directed otherwise. Should any conditions arise which would cause any piping or ductwork to be exposed in finished areas, it shall be immediately called to the Architect's attention. In unfinished spaces such as equipment rooms, all pipe and duct shall be run as high as possible, shall be run to a continuous grade and shall be grouped wherever it is feasible to do so.

1.11.5 All pipe, duct, etc., shall be cut accurately to measurements established at the building and shall be worked into place without springing or forcing. All ducts and pipes run exposed in machinery and equipment rooms shall be installed parallel to the building planes except that the lines shall be sloped to obtain the proper pitch. Piping and ducts run above furred ceilings, etc., shall be similarly installed, except as otherwise shown. All pipe and duct openings shall be kept closed during construction until the systems are closed with final connections.

1.11.6 The construction details of the building are illustrated on the Architectural and Structural Drawings. The trades shall thoroughly acquaint themselves with the details before submitting their bid as no allowance will be made because of unfamiliarity with these details. For new construction, place all inserts to accommodate the ultimate installation of pipe hangers in the forms before concrete is poured and set sleeves in forms before construction. For existing construction, all required inserts shall be "drilled-in" and all openings required through concrete or masonry shall be "saw-cut" or "core drilled" with tools specifically designed for this purpose. Explosive or compression driven inserts shall only be allowed for use as approved by SMACNA and the manufacturer of these devices. All concealed lines shall be installed as required by the pace of the job to precede the general construction.

1.11.7 The mechanical plans do not give exact locations of outlets, fixtures, equipment items, etc. The exact location of each item shall be determined by reference to the general plans and to all detail drawings, equipment drawings, roughing-in drawings, etc., by measurements at the building and in cooperation with other trades. Minor relocations necessitated by the conditions at the site or directed by the Owner shall be made without additional cost to the Owner.

1.11.8 All oiling devices and all parts of equipment requiring adjustment shall be easily accessible. Equipment shall be so located and installed as to permit convenient and safe maintenance and future replacement. The trade furnishing the equipment shall be responsible prior to ordering same in the event that equipment specified and/or approved is incompatible with this requirement.

1.12 ISOLATION:

1.12.1 Transmission of perceptible vibration, structure-borne noise, or objectional air borne noise to occupied areas by equipment installed under this contract will not be permitted.

1.12.2 The isolation supplier shall be a firm or individual capable of dealing effectively with vibration and noise characteristics, effects and criteria and have facilities and capabilities for measuring and evaluating such disturbances and the preparation of drawings and installation instructions.

1.13 CONSTRUCTION SAFETY:

This contractor assumes all responsibility regarding the safety of his personnel on the project during construction. The Contract Documents do not include materials, procedures, components, etc., required to ensure construction safety. Refer to General Conditions and Supplementary General Conditions for additional information.

1.14 DAMAGE:

1.14.1 This Contractor shall be responsible for damage to project caused by this Contractor's failure to recognize hazards associated with items such as leaks, scheduling of work, inexperienced workmen, excessive cutting, etc.

1.14.2 This Contractor shall repair, at no expense to the Owner, any such damage.

1.14.3 This contractor shall familiarize himself with working conditions to the extent that he shall be responsible for damage to concealed piping, wiring and other equipment to remain and shall repair any damage caused by his negligence at no cost to the Owner.

1.15 SAFETY GUARDS:

Contractor shall furnish and install all safety guards required. All belt driven equipment, projecting shafts and other rotating parts shall be enclosed or adequately guarded.

1.16 STORAGE OF MATERIALS:

Each contractor shall provide space for storage of materials, equipment or tools at ground level. Any storage contemplated within the building will be allowed only upon specific approval of the Architect.

1.17 LOCAL CUSTOMS:

Each Sub-contractor shall comply with local customs as to which particular trade shall install any part or parts of any work or equipment specified herein.

1.18 MANUFACTURER'S DIRECTIONS:

The manufacturers' published directions shall be followed in the delivery, storage, protection, installation, piping and wiring of all equipment and material. The Contractor shall promptly notify the Architect in writing of any conflict between the requirements of the contract documents and the manufacturers' directions and shall obtain the Architect's instructions before proceeding with the work. Any such work performed that does not comply with the manufacturers' directions shall have deficiencies corrected at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS:

All materials shall be new and free from defects at the time of installation. Materials or equipment damaged in shipment or otherwise damaged prior to installation shall not be repaired at the job site, but shall be replaced with new materials.

2.2 MANUFACTURER'S REQUIREMENTS:

When a manufacturer's name appears in these specifications, it is not to be construed that the manufacturer does not have to meet the full requirements of the specifications or that his standard cataloged item will be acceptable.

2.3 SERVICE AND REPAIR PARTS:

All equipment installed on this project shall have local representation, local factory authorized service, and a local stock of repair parts.

2.4 FLAME SPREAD PROPERTIES OF MATERIALS:

All materials and adhesives used for air conditioning filters, acoustical lining, and insulation shall conform to NFPA and UL life, safety and flame spread properties of materials. The composite

classifications shall not exceed 25 for a flame spread rating and 50 for a smoke developed rating for these classifications as listed for the basic materials. The finishes, adhesives, etc., specified for each system and shall be such when completely assembled.

2.5 ACCESS PANELS:

Provide flush mounted metal access panels and frames with concealed hinges and key actuated locks for all concealed and otherwise inaccessible valves, parts, fittings, equipment, filters, etc. and as required for

inspection or service. Panels shall be paint grip galvanized steel, primed and ready for finished painting. Paint to match adjacent finishes.

2.6 FLOOR, CEILING AND WALL PLATES:

2.6.1 Refer to AIA General Conditions.

2.6.2 In addition to the requirements of the above referenced portions of this specification, all Subcontractors shall furnish a chromium plated sectional escutcheon in each finished space on each pipe or hanger rod penetrating a wall, floor or ceiling. Escutcheons shall be sized to fit snugly to all lines and where the lines are insulated, the escutcheons shall be fit snugly over the insulation. These plates shall be provided with set screws so that they fit snugly against the finished surface. All equipment rooms are classified as finished space.

2.7 EQUIPMENT NAME PLATE:

Each piece of equipment shall have a metal nameplate engraved with the manufacturer's name, the equipment's model number, and the equipment's serial number. The metal nameplate shall also be engraved with the equipment's capacity, voltage, horsepower, manufactured date and the equipment designation (i.e. FCU-1, etc.) corresponding with the plans. This metal nameplate shall be fastened to the equipment with pop rivets. Plastic or stick-on type labels will not be acceptable.

2.8 IDENTIFICATION:

2.8.1 Each piece of equipment; every valve whose service and/or duty is not readily apparent; each zone duct, outside air duct and return air duct whose duty is not immediately apparent; every piping system except cast iron sewer lines, shall be permanently and clearly identified.

2.8.2 Equipment, valves and duct shall be provided with laminated phenolic nameplates, with engraved letters on light background, appropriately engraved with proper identification correlated to the designation shown on the drawings. Punched plastic tape will not be acceptable. Insulated equipment may have identification taped on as for piping system.

2.8.3 Piping systems shall have designation on ten foot (10'-0") centers and closer where required to provide adequate identification, using "all temperature permacode" pipe markers with direction of flow and service indication.

2.8.4 All these pipe markers shall conform to ANSI-A-13 "Scheme for the Identification of Piping Systems". Arrow markers must have the same ANSI background colors as their companion pipe markers.

2.9 SLEEVES AND PENETRATIONS:

2.9.1 Refer to AIA General Conditions.

2.9.2 Each and every pipe and duct, regardless of material, which passes through a concrete slab, (except slab on grade), masonry wall, roof or other portion of the building structure shall be free from the structure and shall pass through a sleeve furnished and installed by the Subcontractor responsible for the work involved.

2.9.3 Above grade and dry location sleeves shall be constructed from 18 gauge galvanized steel and shall be flush on both sides of wall surface penetrated. The sleeves shall be sized to allow free passage of the pipe to be inserted, and when this pipe is to be insulated, the sleeves shall be large enough to pass the insulation. Floor sleeves located in pipe chases shall extend up two inches (2") above the floor slab.

2.9.4 Sleeves passing through walls or floors on or below grade and/or in moist areas shall be constructed of galvanized steel, schedule 40 pipe and shall be designed with suitable flange in the center of the floor or wall

to form a waterproof passage. After the pipes have been installed in the sleeves, void space around the pipe shall be caulked to insure a waterproof penetration. Fire ratings of rated walls and floors shall be maintained by the use of approved materials.

2.9.5 All penetrations through fire rated ceilings, walls or floors shall be fire stopped using approved materials to maintain the fire rating of the ceiling, wall or floor structure. Penetrations shall meet or exceed the requirements set forth in the U.L. Fire Resistance Directory, Volumes I and II.

2.9.6 After installation of pipe and duct through sleeves, all sleeves shall be sealed with materials suitable for maintaining thermal resistance, acoustic properties, and weatherproofing of walls, roofs, etc. Refer to Architectural specifications.

2.9.7 Mechanical sleeve seals shall be modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.9.8 Formed steel channel shall be galvanized 12 gauge thick steel, with holes 1-1/2 inches on center.

PART 3 - EXECUTION

3.1 WORKMANSHIP:

3.1.1 All work shall be done by experienced craftsmen skilled in the applicable trade.

3.1.2 Unprofessional and incomplete work shall be rejected and corrected at no additional expense.

3.2 PROTECTION OF EQUIPMENT:

The Contractor shall continuously maintain adequate protection of both stored and installed materials and equipment. Fixtures and equipment, whether located inside or outside, shall be tightly covered with sheet polyethylene or waterproof tarpaulin as protection against dirt, rust, moisture and abuse from other trades. Adequate air circulation shall be provided under any protective sheet to prevent condensate build up. Materials and equipment shall not be stored directly on the ground, floor or roof deck. Ductwork, piping and equipment shall not be used by other trades as supports for scaffolds or personnel. At the completion of the work, equipment, fixtures, exposed supports and piping shall be cleaned of dirt, construction debris, overspray, etc., to the satisfaction of the Architect. Repairs made necessary by damage shall be paid for by the Contractor.

3.3 PROTECTION OF STRUCTURE:

Each Contractor in performing his work shall take particular care not to damage the structure. All finished floors and step treads shall be covered to prevent any damage by workmen or their tools and equipment during the construction of the building. In addition, each Contractor shall protect any materials on the job site whether a part of this contract or the property of another Contractor.

3.4 CONFLICTS, INTERFERENCES AND COORDINATION BETWEEN TRADES:

3.4.1 The drawings are not to be construed as shop drawings, but indicate the extent, general location, arrangement, etc., of piping systems and equipment. This Contractor shall refer to other sections of the specifications and other drawings such as electrical, structural, architectural, etc., in order to eliminate conflicts and undue delays in the progress of the work. Where other Contractors furnish items requiring piping connections by this Contractor, they will be held responsible for providing roughing-in drawings and assistance upon request.

3.4.2 Each trade shall so harmonize its work with that of the other trades so that the work may be done in the most direct and workmanlike manner without hindering the other trades. Piping interference shall be handled by giving precedence to pipe lines which require a stated grade for proper operation. Where space requirements conflict, the following order of precedence shall be observed:

A. Building lines

B. Structural members

C. Soil and drain piping

D. Vent piping

E. Condensate piping

F. Supply ductwork

G. Exhaust ductwork

H. Return Ductwork

I. Domestic water piping

J. Refrigerant piping

K. Electrical conduit

L. Natural gas piping

3.4.3 In the event of conflicts between specifications and drawings, drawings shall take precedence over specifications except in matters pertaining to quality, applications, and coordination between trades, which shall be governed by specifications.

3.4.4 Plans, specifications and other documents have been prepared and developed with reasonable professional care and coordination. It is the intent that all documents are supportive and complimentary, one to the other; and as such what is required by one shall be considered as required and binding as if indicated by all. Work indicated shall include, regardless of whether or not specifically indicated, such supportive or required items or work is consistent with what is indicated, is reasonably inferable from what is indicated, and/or is common construction procedure or knowledge with regard to what is indicated.

3.4.5 In the event of conflict between codes, as interpreted by the authority having jurisdiction and the contract documents, the codes shall govern.

3.4.6 In the event of conflict between manufacturer's installation instructions and the drawings, the manufacturer's installation instructions shall govern.

3.4.7 Should discrepancies be found between the documents and/or an interpretation is required, and a decision or interpretation to the contractor is not rendered by the Architect, it shall be assumed the contractor has reviewed all the documents to find the most costly method for items in question which then shall be required. One document does not take precedence over another when interpreting a discrepancy.

3.5 CUTTING AND PATCHING:

3.5.1 All cutting required by the installation of sleeves, piping, equipment, etc., shall be coordinated with the General Contractor, but performed by this Contractor. Patching shall be by the General Contractor. This Contractor shall not cut any structural element or any finished work without permission from the Architect.

3.5.2 This Contractor shall cut and patch all paving as required by the installation of buried piping, including utilities.

3.6 PAINTING:

3.6.1 All painting except "touch-up", natural gas piping, exposed sprinkler and fireline piping, and mechanical room piping shall be provided under the painting sections (Division 9) unless noted otherwise. All exposed piping, equipment, etc., shall be left clean and free from rust or grease and ready for the painter.

3.6.2 Where equipment finishes are damaged, this Contractor shall obtain matching color touch-up paint from the equipment's manufacturer and paint as required.

3.7 LUBRICATION:

This Contractor shall provide all lubricants for the operation of all equipment until acceptance. The Contractor shall be required to protect all bearings during the installation and shall thoroughly grease steel shafts to prevent corrosion. All motors and other equipment shall be provided with covers as required for proper protection during construction. All equipment bearings requiring periodic lubrication shall be provided with proper fittings for this purpose. Where equipment requiring such lubrication is not readily accessible due to location, copper tubing extensions shall be provided in addition to lubrication fittings.

3.8 ELECTRICAL WORK:

3.8.1 Except for such items that are completely wired at their point of manufacture and so delivered and unless specifically noted to the contrary herein, the Electrical Contractor shall provide all electric wiring (50 VAC and above) for power supply. This includes mounting of all electrical devices furnished under this section (Mechanical) of these specifications.

Conduit and wiring (below 50 VAC) for all automatic controls, temperature control, temperature indication, and interlock shall be provided by the Temperature Controls Contractor. The furnishing of all disconnect switches as required for proper operation as shown on the drawings and required by code will be under Electrical Work, except where specifically designated on the plans. The furnishing of all starters for mechanical equipment will be done under this section (Mechanical) of these specifications. The temperature controls contractor shall coordinate all 50 VAC and above requirements with the electrical contractor prior to bid.

3.8.2 Furnishing of complete wiring diagrams showing power wiring and interlock wiring shall be work under the trade supplying the equipment. Diagrams shall be based on approved equipment and shall be complete integral drawings, not a series of manufacturer's individual diagrams. After these diagrams have been approved by the Architect/Engineer, copies shall be furnished to the trades involved and they shall be followed in detail.

3.8.3 The electrical design and drawings are based on the equipment scheduled and shown on the drawings and should any mechanical equipment requiring changes to the electrical design be approved, the required electrical changes shall be made at the expense of the trade furnishing the changed equipment and at no cost to the Owner.

3.9 EQUIPMENT CONNECTION:

This Contractor shall bring required services to equipment items furnished under other sections of this specification or by the Owner, make final connections, and leave equipment ready for operation. Where it is necessary for Contractors performing work covered by this section to make final connections to items of equipment being furnished by Contractors under other sections, all such work shall be performed in a neat and workmanlike manner and all materials shall be of quality and finish normally used for such installation.

3.10 OPERATION PRIOR TO COMPLETION:

When any piece of mechanical or electrical equipment is operable and it is to the advantage of the Contractor to operate the equipment, he may do so providing that he properly cleans the equipment, installs clean filter media, properly adjusts and completes all punch list items before final acceptance by the Owner. The date of acceptance and the start of the warranty may not be the same date. Filters shall be installed in any air-handling unit, fan-coil unit, rooftop unit, etc. prior to temporary use.

3.11 EQUIPMENT AND AIR INTAKE ARRANGEMENTS:

All equipment shall be installed in a manner to permit access to all surfaces requiring access. All valves, motors, drives, lubrication devices, filters and other necessary items shall be installed in a position to allow removal for service without disassembly of another part. Separation shall be 12 ft. minimum.

3.12 EXECUTION OF WORK:

The Contractor shall plan, schedule and execute his work and that of any of his Sub-contractors so as not to interfere with the work of other trades or Contractors in the building or on the premises.

3.13 FLASHING AND WATERPROOFING:

All building penetrations to outside shall be flashed and counter flashed as required to eliminate leaks.

3.14 TESTS:

All tests shall be made by this Contractor and repeated until approved by the Architect. Piping systems shall not be covered or otherwise concealed until tests have been made and approvals obtained. Notify the Architect four days prior to tests to allow for scheduling. Test the piping systems as indicated in applicable articles.

3.15 CLEAN-UP:

3.15.1 It shall be the responsibility of each trade to cooperate fully with the other trades on the job to help keep the job site in a clean and safe condition. At the end of each day's work, each trade shall properly store all of his tools, equipment, any surplus materials and remove all debris caused by his portion of the work.

3.15.2 When all work has been finally tested, the Contractor shall clean all work installed by him, including all fixtures, equipment, pipes, ducts and all exposed work. All pipes shall be flushed out and left free of all obstructions. All plates, grilles, and other finished products shall be thoroughly cleaned and polished.

3.16 FINAL OBSERVATIONS:

3.16.1 It shall be the duty of the Contractor to make a careful inspection trip of the entire project, assuring himself that the work on the project is ready for final acceptance, before calling upon the Architect/Engineer to make a final observation.

In order not to delay final acceptance of the work, the Contractor shall have all necessary bonds, guarantees, receipts, affidavits, etc., called for in the various articles of this specification, prepared and signed in advance, and together with a letter of transmittal listing each paper included, and shall deliver the same to the Architect/Engineer at or before the time of the final observations. The Contractor is cautioned to check over each bond, receipt, etc., before preparing same for submission to see that the items check with the requirements of the specification.

END OF SECTION

SECTION 23 05 03 - HVAC PIPING

PART 1 - GENERAL

1.1 SCOPE:

Work in this section shall include piping, fittings, accessories etc., to be used in piping systems in accordance with the intent of the Contract Documents and shall include the following principal items:

Piping
Valves
Piping Accessories

1.2 REFERENCES

A. American Society of Mechanical Engineers (ASME).
B. American Society of Testing & Materials (ASTM).
C. American Welding Society.
D. American Water Works Association (AWWA).
E. National Fire Protection Association (NFPA).
F. National Bureau of Standards (NBS).

1.3 SUBMITTALS:

Submittals are required as indicated only. Submittal of pipe and fittings is not required unless a deviation from the specification is proposed.

1.4 QUALITY ASSURANCE

A. Perform work in accordance with ASME code for installation of piping systems and ASME Section IX for welding materials and procedures.

PART 2 - PRODUCTS

2.1 EQUIPMENT DRAINS, OVERFLOWS AND RELIEF PIPING:

2.1.1 Condensate drain piping, auxiliary drain piping, and equipment drain piping shall be type "L" hard drawn copper piping with cast and/or wrought copper fittings per ASTM B-88, 95/5 solder. Provide pipe supports at specified intervals with only copper-plated, copper or brass in contact with copper piping.

2.1.2 All drain piping shall be installed with a minimum fall of 1/8" per foot unless noted otherwise on plan.

2.1.3 The HVAC Subcontractor shall provide all drain piping required for or related to HVAC equipment whether indicated on plan or not. Coordinate all termination points required with the Plumbing Subcontractor.

2.1.4 The size of condensate drain piping from HVAC equipment shall be indicated on the plans. Where no size is shown, piping shall not be less than 3/4" and in no case less than in accordance with the following schedule:

Coil Nominal Tonnage	Copper Pipe Size
Up to 2	3/4"
2 1/2 to 5	1"
6 to 14	1 1/2"

2.1.5 The HVAC Subcontractor shall provide all drain piping required for or related to HVAC equipment whether indicated on plan or not. Coordinate all termination points required with the Plumbing Subcontractor.

2.2 REFRIGERATION PIPING:

2.2.1 All accessible refrigeration piping from the air cooled condensing units/heat pumps to the refrigerant coil shall be Type "L" hard drawn copper per ASTM B-88. All such piping concealed in walls and chases/furrings shall be Type "L" soft copper with long radius bends. Joints concealed in wall and chases/ furrings are not acceptable. All fittings and joints shall be made with silver-fos solder. Provide strainer-dryer combination and liquid solenoid valves at refrigerant coil and condensing unit/heat pump. Thermostatic expansion valves and all accessories shall be equal to Alco, Inc., SPORLAN or approved equal. Provide and install distributors for multistage units equal to Alco, Inc. suitable for modulating flow rates. Provide specialties such as solenoid valves, sight glasses, accumulators, and filter/dryers as required for proper system operation. Components shall be specifically designed for refrigeration service.

2.3 PIPE HANGERS AND SUPPORTS: <S>

A. Conform to ASME, ASTM and MSS SP requirements.
B. Hangers for pipe sizes ½ to 1-1/2 inches: carbon steel, adjustable swivel, split ring.
C. Hangers for cold pipe sizes 2-1/2 inches and larger: carbon steel, adjustable, clevis.
D. Multiple or trapeze hangers: steel channels with welded spacers and hanger rods.
E. Wall support for pipe sizes 3 inches and smaller: cast iron hooks.
F. Wall support for pipe sizes 4 inches and larger: welded steel bracket and wrought steel clamp.
G. Vertical support: steel riser clamp.
H. Floor support for cold pipe: cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
I. Copper pipe support: carbon steel rings, adjustable, copper plated.
J. Hanger rods: mild steel threaded both ends, threaded on end, or continuous threaded.
K. Inserts: malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.4 PIPING ACCESSORIES GENERAL:

A. Unions shall be all bronze for copper systems and malleable iron with ground joint for steel piping systems. Provide dielectric unions for joining dissimilar metallic piping systems.

B. Escutcheons shall be single piece, set screw type, chrome plated and shall cover the opening and sleeve.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION:

3.1.1 The piping systems required under the Mechanical division of these specifications shall be installed in a neat and workmanlike manner. All pipe hangers shall be of the type mentioned in this section or as indicated and shall be so spaced and installed as to maintain a rigid piping system, adequately supported both laterally and vertically.

3.1.2 Each of the piping systems shall be installed to provide for expansion and contraction and the joints shall be soldered at such time that the system is not under strain.

3.1.3 Necessary spring pieces and offsets shall be furnished by this Contractor as required.

3.1.4 Each of the piping systems shall be concealed in chases and above ceilings and in walls in all finished areas and shall be run exposed only as specifically specified or as shown on the drawings in machinery spaces or unfinished areas.

3.1.5 Exposed piping shall be held close to the walls and ceilings and necessary fittings shall be provided and installed to allow for offsets to hold the piping close to wall and ceilings. Where these lines run exposed a clearance shall be obtained from the Architect in writing before making the installation.

3.1.6 Pipe shall be cut accurately to measurements established at the site and worked into place without springing or forcing.

3.1.7 Provide clearance for installation of insulation and for access to valves, drain and unions.

3.1.8 Locate and suspend piping in such a manner so as to minimize transmission of vibration and noise.

3.1.9 All piping penetrations through fire rated ceilings, walls or floors shall be fire stopped using approved materials to maintain the fire rating of the ceiling, wall or floor structure. Fire stop shall be equal to BIO Fireshield, Inc., BIOTHERM 200 or BIO K-2 mortar as applicable.

3.1.10 All piping connections to equipment and fixtures shall contain flanges or unions to allow easy removal whether or not shown on the plans.

3.1.11 Air gaps for all indirect waste connections (open-sight) shall be at least twice the effective drain piping diameter and in no case less than 2".

3.2 PIPING JOINTS:

Solder joints shall be assembled with square cut pipe using a pipe cutter. Hack saw cut pipe ends shall be reamed to full size. Both the pipe and fittings shall be furnished absolutely clean. Brazing flux shall be applied to both the pipe and the fittings. The use of corrosive acid flux will not be permitted. During the brazing, the pipe and fittings must be charged with nitrogen gas.

3.3 SECURING AND SUPPORTING OF PIPE:

3.3.1 All pipe shall be supported from the building structure by means of approved hangers and supports. Piping shall be supported to maintain required grade and pitch, prevent vibration and provide for expansion/contraction.

3.3.2 All hangers shall be secured to approved inserts wherever possible and practicable. Hanger inserts shall be set in place before concrete is poured. Where hangers attach to the structural steel framing, approved beam clamps shall be employed. Where required, the Mechanical Subcontractor shall install channels to span between framing members. In no case shall spacing of hangers for horizontal piping be greater than indicated on the following schedule:

COPPER PIPING/TUBING

NOMINAL PIPE SIZE (MAXIMUM)	HANGER SPACING
Up to 1-1/2"	6'-0"
2" and larger	8'-0"

3.3.3 Vertical lines shall be adequately supported at their bases, either by a suitable hanger placed in the horizontal line near the riser, or by a base fitting set on a pedestal or foundation and from each floor slab by means of approved clamp type support bearing on the slab or beam. In no case shall the spacing of supports for vertical piping be greater than indicated on the following schedule:

COPPER PIPING/TUBING

NOMINAL PIPE SIZE (MAXIMUM)	SUPPORT SPACING
Up to 1-1/4"	4'-0"
1-1/2" and larger	At the base and at each story level, not exceeding 15'-0" intervals

3.3.4 Hangers for piping 2" and smaller shall be of the split cast ring type with fastening device. Hangers for piping larger than 2" shall be of the adjustable clevis hanger type. Hanger rods shall be minimum 3/8" diameter and shall have machine threads. Brackets of approved type may be used along walls. Hanger rods for individually suspended horizontal pipes shall be steel rods of size indicated on the following table:

NOMINAL PIPE SIZE (MAXIMUM)	ROD SIZE
1/2" to 2"	3/8"
2-1/2" to 3"	1/2"

3.3.5 Hangers for use with copper piping shall be copper plated ferrous sizes for copper tubing.

3.3.6 Hangers shall be installed within 2'-0" of each change in direction, either vertical or horizontal, or pipe tee and on each side of valves, strainers, etc.

3.3.7 Where "cold" pipes are insulated with a vapor sealing jacket, the hanger shall be oversized accordingly to accommodate the outside diameter of the insulation, and half-round 16 gauge galvanized steel shields, not less than 14" long, rolled to fit the insulation diameter, shall be provided between the insulation and the hanger.

3.3.8 Pipe supports shall be as manufactured by Fee and Mason, Grinnell, F&S Manufacturing, or prior-approved equal.

3.4 INSTALLATION – INSERTS

A. Provide inserts for placement in concrete forms.

B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

C. Provide hooked rod to concrete reinforcement section for inserts carrying pipe 4 inches (100 mm) and larger.

D. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.

E. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.5 INSTALLATION - PIPE HANGERS AND SUPPORTS

A. Install in accordance with ASME, ASTM and MSS SP.

B. Support horizontal piping as scheduled.

C. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

D. Place hangers within 12 inches of each horizontal elbow.

E. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.

F. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.

G. Where installing several pipes in parallel and at same elevation, provide multiple pipe hangers or trapeze hangers.

H. Provide copper plated hangers and supports for copper piping.

I. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

J. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

END OF SECTION

SECTION 23 05 53 - MECHANICAL IDENTIFICATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Nameplates.
2. Tags.
3. Stencils.
4. Pipe markers.
5. Ceiling tacks.
6. Labels.

1.2 REFERENCES

A. American Society of Mechanical Engineers:
1. ASME A13.1 - Scheme for the Identification of Piping Systems.

B. Section 23 05 00 – Common Work Results for HVAC

1.3 SUBMITTALS

A. Division 1 - Submittal Procedures:

B. Product Data: Submit manufacturers catalog literature for each product required.

C. Shop Drawings: Submit list of wording, symbols, letter size, and color coding for mechanical identification and valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

1.4 QUALITY ASSURANCE

A. Conform to ASME A13.1 for color scheme for identification of piping systems and accessories.

1.5 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 NAMEPLATES

A. Equipment Nameplates: Metal nameplate with engraved or stamped data including manufacturer's name, equipment model and serial numbers, capacity, voltage, horsepower, manufactured date and equipment designation corresponding to the plans. Nameplate shall include the room number served as designated by the owner.

B. Equipment Marker: Laminated three-layer plastic with engraved black letters data on light contrasting background color including equipment name and designation corresponding to the plans and the area the equipment serves, including both the owner's room name and number. Size shall be 4" x 6" minimum for equipment, 3/4" x 2" for switches, sensors, and control components.

2.2 TAGS

A. Metal Tags:
   1. Brass with stamped letters; tag size minimum 1-1/2 inches diameter with finished edges and brass beaded chain or s-hook.

B. Tag Chart: Typewritten letter size list of applied tags and location in anodized aluminum frame.

2.3 STENCILS

A. Stencils: With clean cut symbols and letters of following size:
   1. Up to 2 inches Outside Diameter of Insulation or Pipe: 1/2 inch high letters.
   2. 2-1/2 to 6 inches Outside Diameter of Insulation or Pipe: 1-inch high letters.
   3. Over 6 inches Outside Diameter of Insulation or Pipe: 1-3/4 inches inches high letters.
   4. Ductwork and Equipment: 1-3/4 inches high letters.

B. Stencil Paint: semi-gloss enamel, colors and lettering size conforming to ASME A13.1.

2.4 PIPE MARKERS

A. Color and Lettering: Conform to ASME A13.1.

B. Plastic Pipe Markers:
   1. Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering. Larger sizes may have maximum sheet size with spring fastener.

C. Plastic Tape Pipe Markers:
   1. Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

D. Plastic Underground Pipe Markers:
   1. Bright colored continuously printed plastic ribbon tape, minimum 6 inches (150 mm) wide by 4 mil (0.10 mm) thick, manufactured for direct burial service.

2.5 CEILING TACKS

A. Description: Steel with 3/4 inch (19 mm) diameter color-coded head.

B. Color code as follows:
   1. HVAC equipment: Yellow.
   2. Fire dampers/smoke dampers: Red.
   3. Plumbing valves: Green.

2.6 LABELS

A. Description: Aluminum, size 2.0 x 0.75 inches, adhesive backed with printed identification.

PART 3 EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces in accordance with Section 09 90 00 for stencil painting.

3.2 INSTALLATION

A. Apply stencil painting in accordance with Section 09 90 00.

B. Install identifying devices after completion of coverings and painting.

C. Install labels with sufficient adhesive for permanent adhesion and seal with clear lacquer. For unfinished canvas covering, apply paint primer before applying labels.

D. Install tags using corrosion resistant chain. Number tags consecutively by location.

E. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.

F. Identify water heaters, exhaust fans, duct dampers, heating units, fans, air handling units, and pumps with equipment markers. Identify condensing units/heat pumps with equipment name plates.

G. Identify access panels, control panels, and major control components outside panels with equipment markers.

H. Identify valves in main and branch piping with tags.

I. Tag automatic controls, instruments, and relays. Key to control schematic. Provide equipment nameplates for all automatic control panels.

J. Identify piping, concealed or exposed, with plastic pipe markers, plastic tape pipe markers, or stenciled painting. Identify service, and flow direction. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet (6 m) on straight runs including risers and drops, adjacent to each valve and tee, at each side of penetration of structure, wall, or enclosure, and at each obstruction.

K. Provide ceiling tacks to locate valves, air handling units, fans, or dampers above T-bar type panel ceilings. Locate in corner of panel closest to equipment. Use different color approved by owner for each item type.

L. Provide equipment markers for fan control switches.

M. Contractor shall obtain written approval of proposed identification scheme from the Owner's maintenance supervisor prior to application of identification.

END OF SECTION

SECTION 23 05 90 - CLEANING AND TESTING FOR HVAC SYSTEMS

PART 1 - GENERAL

1.1 GENERAL:

Refer to Section 23 05 00 for Common Work Results for HVAC.

1.2 SCOPE:

1.2.1 This Contractor shall, at his own expense, during the progress of the work or upon its completion, make such tests of his work as are herein specified in accordance with all laws, governing authorities, or as are required by Architect or by state or municipal bureaus having jurisdiction and under their supervision. The Contractor shall provide all apparatus, temporary piping connections, electrical, or any other requirements necessary for such tests. He shall take all due precautions to prevent damage to building or its contents incurred by such tests, as he will be required to repair and make good, at his own expense, any damage so caused. Any leaks, defects or deficiencies discovered as a result of the tests shall be immediately repaired or made good and test shall be repeated until the test requirements are fully complied with.

1.2.2 No work of any nature shall be covered, enclosed or otherwise concealed until properly inspected, tested and approved. Any leaks which develop during any of the tests shall be corrected with new material and made as good as required; said tests shall be repeated until the work is satisfactory to Architect and the mechanical inspectors in every way.

1.2.3 Each separate system with its various components shall be operated by this Contractor as required by the applicable code and for a reasonable length of time to demonstrate the performance of all equipment and piping in accordance with the true intent and purpose of the plans and specifications. All necessary adjustments shall be made to the satisfaction of the Architect.

1.2.4 All motor driven equipment shall be proved operable generally in accordance with the intent of these specifications.

1.2.5 All electrical power and water for testing shall be provided by the Contractor.

PART 2 - PRODUCTS

Not applicable.

PART 3 - EXECUTION

3.1 TESTING AND ADJUSTING:

3.1.1 Heating, Ventilating and Air Conditioning Systems: Each and every phase of the new air conditioning, heating and ventilating systems shall be operated separately, or in conjunction with the others for a period of time to demonstrate to the satisfaction of the Architect the ability of the equipment to meet the capacity and performance requirements while maintaining design conditions in accordance with the true intent and purpose of these specifications. Heating and cooling capacities and performance for every system shall be checked in the winter and summer, respectively. Any adjustments and/or startup required shall be done at no additional cost to the owner. Any adjustments done during one season shall not affect capacities and performance during the other season. The volume of air at each outlet and inlet, air conditioning equipment performance data, etc., shall be tabulated and required balancing performed by engineering personnel skilled, trained and experienced in the performance of these functions. Previous to such performance tests, this Contractor shall have set all valves, dampers, motors, controllers, thermostats, etc., and shall have the system operating and maintaining design temperatures, humidity and air circulation throughout all areas of the building. This

Contractor shall also at the proper time make such additional adjustments as may be required to obtain consistent temperatures throughout the project.

3.2 NOISE LEVEL:

3.2.1 All items of equipment shown on the plans and specified herein have been selected so that the anticipated noise level in the building from the air conditioning and other systems will not be above 30NC level.

3.2.2 If the Contractor wishes to make substitution of equipment from that selected, he must satisfy himself and the Architect that the noise level in the building will not exceed 30NC.

END OF SECTION

SECTION 23 05 93 - TESTING, ADJUSTING AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

All division 23 specification sections, drawings, and general provisions of the contract apply to work of this section, as do other documents referred to in this section.

1.2 SCOPE OF WORK:

1.2.1 The Contractor shall obtain the services of an independent Test and Balance (TAB) Company which specializes in the testing and balancing of heating, ventilating and air conditioning (HVAC) systems to test, adjust and balance all HVAC systems in the building(s).

1.2.2 The work included in this section consists of furnishing labor, instruments, and tools required in testing, adjusting and balancing the HVAC systems as described in these specifications or shown on accompanying drawings. Services shall include checking equipment performance, taking the specified measurements, and recording and reporting the results. The testing, adjusting and balancing agency shall act as a reporting agency; that is, list and report each piece of equipment as to identification number, manufacturer, model number, serial number, proper location, specified performance, and report actual performance of all equipment as found during testing. The report is intended to be used during the life of the building as a ready reference indicating original conditions, equipment components, etc.

1.2.3 Representatives of the Test and Balance Company shall visit the job site during installation of the HVAC equipment, piping and ductwork as required.

1.2.4 Upon completion of the HVAC system installation, the Test and Balance Company shall perform all required testing and balancing with the full cooperation of the Contractor and his Sub-contractors. The Contractor shall make changes and/or adjustments to the HVAC system components that are required by the Test and Balance Company to accomplish proper balancing. The TAB agency shall not supply or install any materials or balancing devices, such as pulleys, drives, belts, etc. All of this work is by the Contractor and shall be performed at no additional cost to the Owner.

1.2.6 The test and balance report complete with a summary page listing all deficiencies shall be submitted to the Architect for review by his Mechanical Engineer. If the Mechanical Engineer agrees with the report, he shall sign it and return it to the Architect. The test and balance report must be complete and must be accepted by the Engineer prior to acceptance of the project. Any outstanding test and balance items shall be placed on the punch list and a monetary value shall be assigned to them.

1.2.7 After all deficiencies have been corrected the Mechanical Engineer shall sign the testing and balancing report, and the Test and Balance Company shall supply four (4) copies of the final and complete report to the Architect for inclusion in the Operation and Maintenance Manuals. Testing and balancing must be accepted by architect prior to acceptance of project.

1.2.8 The items requiring testing, adjusting, and balancing include (but are not restricted to) the following:

AIR SYSTEMS:
Supply Fan (AHUs, etc.)
Exhaust Fans
Zone branch and main ducts
Diffusers, Registers, Grilles and Dampers
Coils (Air Temperatures)
Vibration Isolators

1.3 DEFINITIONS, REFERENCES, STANDARDS:

All work shall be in accordance with the latest edition of the Associated Air Balance Council (AABC) National Standards or the latest standards of the National Environmental Balancing Bureau (NEBB). If these contract documents set forth more stringent requirements than the AABC National Standards or the NEBB Standards, these contract documents shall prevail.

1.4 QUALIFICATIONS:

Agency Qualifications: The TAB Agency shall be a current member of the AABC or the NEBB. Falsification of a TAB report shall be grounds for reporting the firm's actions to the appropriate certifications agency.

1.5 SUBMITTALS:

1.5.1 Procedures and Agenda: The TAB agency shall submit the TAB procedures and agenda proposed to be used.

1.5.2 Sample Forms: The TAB agency shall submit sample forms, which shall include the minimum data required by the AABC National Standards or the NEBB Standards.

1.6 TAB PREPARATION AND COORDINATION:

1.6.1 Shop drawings, submittal data, up-to-date revisions, change orders, fan curves, pump curves and other data required for planning, preparation, and execution of the TAB work shall be provided when available and no later than 30 days after the Designer has returned the final approved submittal data to the Contractor.

1.6.2 System installation and equipment startup shall be complete prior to the TAB agency being notified to begin.

1.6.3 The building control system (BCS) contractor shall provide and install the control system, including all temperature, pressure and humidity sensors. These shall be calibrated for accurate control. If applicable, the BCS contractor shall install all necessary computers and computer programs, and make these operational. Assistance shall be provided as required for reprogramming, coordination, and problem resolution.

1.6.4 All test points, balancing devices, identification tags, etc., shall be accessible and clear of insulation and other obstructions that would impede TAB procedures.

1.6.5 Qualified installation or startup personnel shall be readily available for the operation and adjustment of the systems. Assistance shall be provided as required for coordination and problem resolution.

1.7 REPORTS:

1.7.1 Final TAB Report - The TAB agency shall submit the final TAB report for review by the Architect. On plans provided, all outlets, devices, HVAC equipment, etc., shall be identified (including manufacturer, model number, serial number, motor manufacturer, HP, drive type, fan and motor sheaves and belt number), along with a numbering system corresponding to report unit identification. The TAB agency shall submit an AABC "National Project Performance Guaranty" (or similar NEBB Guaranty) assuring that the project systems were tested, adjusted and balanced in accordance with the project specifications and AABC National Standards (or similar NEBB Standards). The Designer shall certify his approval on the Performance Guaranty.

1.7.2 Submit 4 copies of the Final TAB Report to the Architect for inclusion in the Operation and Maintenance Manuals.

PART 2 - INSTRUMENTATION

All instruments used for measurements shall be accurate and calibrated. Calibration and maintenance of all instruments shall be in accordance with the requirements of AABC National Standards (or similar NEBB Standards).

PART 3 - EXECUTION

3.1 GENERAL:

3.1.1 The specified systems shall be reviewed and inspected for conformance to design documents. Testing, adjusting and balancing on each identified system shall be performed. The accuracy of measurements shall be in accordance with AABC National Standards (or similar NEBB Standards). Adjustment tolerances shall be + or - 10% unless otherwise stated.

3.1.2 Equipment settings, including manual damper quadrant positions, valve indicators, fan speed control levers, and similar controls and devices shall be marked to show final settings.

3.1.3 All information necessary to complete a proper TAB project and report shall be per AABC or NEBB standards unless otherwise noted. The descriptions of work required, as listed in this section, are a guide to the minimum information needed.

3.1.4 TAB contractor shall cut insulation, ductwork and piping for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. Upon completion, patch insulation, ductwork, and housings using materials identical to those removed. Seal insulation to reestablish integrity of the vapor barrier.

3.1.5 TAB work shall include additional inspection and adjustment of components during the season following the initial balance to include re-balance of any items influenced by seasonal changes or as directed by the Owner.

3.2 AIR SYSTEMS:

3.2.1 The TAB agency shall verify that all ductwork, splitters, extractors, dampers, grilles, registers, and diffusers have been installed per design, are functional and set full open. Any leakage in the ductwork shall be repaired prior to the test. The TAB agency shall perform the following TAB procedures in accordance with the AABC National Standards or NEBB Standards:

For supply fans:

1. Fan Speeds - Test and adjust fan RPM to achieve design CFM requirements.

2. Current and Voltage - Test and record motor voltage and amperage, and compare data with the nameplate limits to ensure fan motor is not in or above the service factor.

3. Pitot-Tube Traverse - Perform a Pitot-tube traverse of main supply and return ducts, as applicable to obtain total CFM. If a Pitot-tube traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet.

4. Outside Air - Test and adjust the outside air on applicable equipment using a Pitot-tube traverse. If a traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet. If a traverse is not practical use the mixed-air temperature method if the inside and outside temperature differences is at least 20 degrees Fahrenheit or use the difference between Pitot-tube traverse of the supply and return air ducts.

5. Static Pressure - Test and record system static pressure, including the static pressure profile of each supply fan.

For exhaust fans:

1. Fan Speeds - Test and adjust fan RPM to achieve design CFM requirements.

2. Current and Voltage - Test and record motor voltage and amperage, and compare data with the nameplate limits to ensure motor is not in or above the service factor.

3. Pitot-Tube Traverse - Perform a Pitot-tube traverse of main exhaust ducts to obtain total CFM. If a Pitot-tube traverse is not practical, an explanation of why a traverse was not made must appear on the appropriate data sheet.

4. Static Pressure - Test and record system static pressure, including the static pressure profile of each exhaust fan.

For zone, branch and main ducts:

1. Adjust ducts to within design CFM requirements. As applicable, at least one zone balancing damper shall be completely open. Multi-diffuser branch ducts shall have at least one outlet or inlet volume damper completely open.

For diffusers, registers and grilles:

1. Tolerances - Test, adjust, and balance each diffuser, grille, and register to within 10% of design requirements. Minimize drafts. Include required CFM, initial test CFM and final CFM.

2. Identification - Identify the type, location, and size of each grille, diffuser, and register. This information shall be recorded on air outlet data sheets.

For coils:

1. Air Temperature - Once air flows are set to acceptable limits, take wet bulb and dry bulb air temperatures on the entering and leaving side of each cooling coil. Dry-bulb temperature shall be taken on the entering and leaving side of each heating coil or each refrigerant coil when in heating mode.

3.3 SOUND TESTING:

3.3.1 The TAB agency shall conduct sound testing in the following areas per AABC National Standards or NEBB Standards and to the criteria listed, using sound meter with octave band analyzer:

TEST AREA	NUMBER OF LOCATIONS	ACCEPTABLE NC LEVEL
Offices	2	35-40
Lab/Work Areas	2	35-40

3.4 VIBRATION TESTING:

3.4.1 The TAB agency shall conduct vibration testing on the following equipment per AABC National Standards (or similar NEBB Standards). Test deflection in mils and velocity in inches per second shall be measured and the results compared to requirements in equipment specification sections.

EQUIPMENT:

Sidewall Exhaust Fans

3.5 ADDITIONAL TAB SERVICES:

3.5.1 Job Site Inspections:
During construction, the TAB agency shall inspect the installation of pipe systems, sheet metal work, temperature controls, and other component parts of the HVAC systems as required.

3.5.2 Verification of HVAC Controls:
The TAB agency shall be assisted by the building control systems Contractor in verifying the operation and calibration of all HVAC and temperature control systems. The following tests shall be conducted:

1. Verify that all control components are installed in accordance with project requirements and are functional, including all electrical interlocks, damper sequences, air and water resets, fire and freeze stats, and other safety devices.

2. Verify that all controlling instruments are calibrated and set for design operating conditions.

3.5.3 Temperature Testing:
To verify system control and operation, a series of three temperature tests shall be taken at approximately two hour intervals in each separately controlled zone. The resulting temperatures shall not vary more than two degrees Fahrenheit from the thermostat or control set point during the tests. Outside temperature and humidity shall also be recorded during the testing periods.

3.5.4 Tab Report Verification:
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.

3.5.5 Fire Testing:
The Contractor shall test fire/smoke dampers in the presence of the TAB agency to assure proper operation. They shall verify that an access door has been installed for each fire damper. For each fire damper, the Contractor shall open the access door, disconnect the fusible link, and allow the damper to close. Operation should be smooth, and the damper must close completely. The Contractor shall then reset the damper.

END OF SECTION

SECTION 23 07 00 - HVAC INSULATION

PART 1 - GENERAL

1.1 GENERAL:

Refer to Section 23 05 00 for General Requirements for mechanical work.

1.2 SCOPE:

The Contractor shall cover all piping and apparatuses, as specified below, with insulation as manufactured by Manville, Owens-Corning or equal. All insulation, jacket, facing and adhesive shall have composite ratings not exceeding flame spread of 25 and smoke development of 50.

PART 2 - PRODUCTS

2.1 DUCTWORK:

All ductwork shall be insulated with 2" thick, three quarter pound per cubic foot minimum density glass fiber blanket insulation and have type FRK foil reinforced kraft vapor barrier jacket. Insulation shall be wrapped tightly on the ductwork with all circumferential joints butted and longitudinal joints overlapped a minimum of 2". Adhere insulation to metal with 4" strips of insulation bonding adhesive at 8" on centers. On longitudinal joints, the overlap shall be secured using 9/16" flared door staples applied 6" on centers and taped with minimum 3" wide foil reinforced kraft tape. All pin penetrations or punctures in facing shall be taped. Tape all circumferential joints with 4" wide foil reinforced kraft tape.

2.2 AIR DISTRIBUTION DEVICES:

Each air distribution device shall be provided with a 2" thick, 3/4 lb density insulation blanket for condensation control. Insulation blanket shall be taped securely and sealed around perimeter of air device neck and backpan.

2.3 REFRIGERANT PIPING:

Refrigerant piping shall be insulated with 1" thick closed cell (expanded) elastomeric tubing equal to Armstrong AP Armaflex. All such materials shall not melt, drip or carry a progressive flame. All such piping and insulation exterior to the building shall be covered with a minimum 0.024" thick aluminum metal jacket. (Hot gas bypass and suction)

2.4 CONDENSATE DRAIN PIPING:

2.4.1 Condensate drain piping from air conditioning units that runs outside of fan housing shall be insulated with 1/2" thick molded fiberglass with a "Universal" white vapor barrier jacket with flap. Furnish manufactured rigid fitting covers.

2.4.2 All piping above slab from floor drains, deep-seal p-traps, hub drains or other devices used for condensate drain termination shall be insulated with 1/2" thick molded fiberglass with a "Universal" white vapor barrier jacket with flap and manufactured rigid fitting covers.

2.5 ALUMINUM METAL JACKET:

All insulation outside, exposed to weather shall be covered with 0.024" aluminum metal jacket.

PART 3 - EXECUTION

3.1 PROCEDURES:

3.1.1 All insulation shall be the product of reputable manufacturers and shall be applied by mechanics skilled in the use of various materials and in the employ of a concern regularly engaged in the insulating business. The materials shall all be applied in accordance with the published standards of the manufacturer of the materials, using any special materials as required by these specifications and by those published standards. Unsightly work shall be just cause for rejection.

3.1.2 All sectional covering shall finish round and smooth, without lumps or depressions and all end and joints shall butt evenly and tightly together and to the covered surface. No broken or damaged section shall be used. When covering is formed from blocks, they shall be carefully and evenly applied, securely wired in place and joints shall be closed with cement insulation.

3.1.3 In instances where insulated lines pass into other areas, wherein the line will not be insulated as described herein, the insulation shall not terminate at the wall, but shall extend full size a minimum of 1" beyond the wall.

3.1.4 Engage the services of a qualified insulation applicator to furnish and install all the insulation required for the mechanical equipment, piping, etc., specified herein.

3.1.5 All surfaces to be insulated shall be clean and dry before applying insulation. All sections of molded pipe covering shall be firmly butted together. No insulation shall be applied until the pipe, duct, etc., have been pressure tested and found tight. Piping flexible connections, flanges and unions shall not be covered unless specifically noted. Flexible connections on ducts shall not be covered.

3.1.6 Refer to Section 23 05 00, for flame spread properties of insulating materials.

3.1.7 Where vapor barriers are required, the vapor barrier shall be on the outside. Extreme care shall be taken that the vapor barrier is unbroken. Joints, etc., shall all be sealed. Where insulation with a vapor barrier terminates, it shall be sealed off with the vapor barrier being tapered continuous to the surface being insulated. Ends shall not be left raw.

3.1.8 Armaflex insulation shall be slid on unslit or shall be applied with contact cement. Duct tape, electrical tape, staples, etc., shall not be permitted.

3.1.9 Metal jackets shall have side and end lap at least 2-inches wide with the cut edge of the side tap turned inside one inch to provide a smooth edge. Overlap the jacket not less than 2 inches at longitudinal and circumferential joints and secure with metal bands at not more than 9-inch centers or with screws at not more than 5-inch centers. Overlap longitudinal joints down to shed water. Seal circumferential joints with a coating recommended by the insulation manufacturer for weatherproofing.
3.1.10 All Armaflex insulation exterior to the building shall be coated with a weatherproof finish recommended by the manufacturer.

END OF SECTION

SECTION 23 09 00 - TEMPERATURE CONTROLS

PART 1 - GENERAL

1.1 GENERAL:

Refer to Section 23 05 00 for Common Work Results for HVAC The temperature controls contractor shall submit for approval complete temperature controls shop drawings to include but not limited to wiring diagrams, control diagrams, sequence of operation and interlocks.

1.2 SCOPE:

1.2.1 Furnish and install all materials, supplies, labor (except electrical) and services for, required in connection with, or properly incidental to, a complete system of temperature control for heating, ventilating and air conditioning. The temperature controls supplier shall furnish all temperature control equipment as described under this heading and a factory trained employee of the control manufacturer shall provide installation supervision as required for the proper installation of the temperature control system. All temperature control wiring exterior to the building and/or exposed shall be installed in rigid metal conduit. All other temperature control wiring shall be installed in EMT. All wiring and conduit (120 VAC and above) in connection with the automatic temperature control system shall be provided by the Electrical Subcontractor under another section of this specification. All wiring and conduit (below 120 VAC) shall be provided by the temperature controls contractor. All conduit in connection with temperature control system shall be installed by a licensed electrical contractor.

PART 2 - PRODUCTS

2.1 GENERAL EQUIPMENT THERMOSTATS: <S>

Thermostats for air conditioning units shall be furnished by the air conditioning unit manufacturer, installed by the mechanical contractor and shall be fully programmable, combination heating/cooling (automatic change over); two stage heating where required and two stage cooling where required, intuitive touch screen, Wi-Fi compatible. Thermostats shall be capable of integration in building level control network (BLCN) and facility management and control system (FMCS). Provide all necessary hardware, wiring, programming, etc. as required for a complete and fully functional system.

2.2 FIRE-STATS: <S>

Provide in each air moving device such as air conditioning units, ventilation fans, exhaust fans, etc., of 600 CFM capacity and larger, a fire-stat to "stop" each respective air moving device upon an entering air temperature to the fan in excess of 125 degrees Fahrenheit (or in excess of that specified in the local codes or by the authority having jurisdiction). Fire-stats shall be a product of Temperature Control Subcontractor and shall be fully adjustable with a temperature range of 125°F to 200°F.

2.3 CONTROL PANEL: <S> <OM>

Unit control panels shall include a fully programmable multicircuit microprocessor based 7-day time clock with skip-a-day feature and manual override. Time clock shall interrupt line voltage circuit to a relay at each location to interrupt thermostat control circuit wired through relay low voltage contacts. Time clock shall be equipped with a 365-day programming feature including up to 16 holiday durations and/or single day holidays per year, programmable by date and true 7-day programming with each circuit independently programmed for each day of the week. A night set back thermostat shall override timeclock to energize each unit control circuit on a drop of space temperature below 55°F.

2.4 DUCT SMOKE DETECTORS: <S>

Duct smoke detectors with accessories shall be a product of, and connected by the fire alarm subcontractor. Installation of duct smoke detectors shall be the responsibility of the mechanical contractor.

2.5 AUTOMATIC DAMPERS: <S>

Modulating dampers shall be of the opposed blade type and shall have blades not exceeding 6" width. Dampers shall be constructed of #16 gauge galvanized steel, rigidly constructed to prevent distortion. Dampers shall have neoprene edges and shall have 10 CFM/sq. ft. leakage maximum at 1" w.g. Provide motorized dampers in all intake and exhaust ducts over 300 CFM to open/close when fan is energized/deenergized.

2.6 DAMPER OPERATORS: <S><OM>

Damper motors shall be of the reversing, quiet, oil immersed type, ample in size to handle the load imposed on them and shall conform to the requirements detailed in the sequence descriptions of this specification.

2.7 MISCELLANEOUS:

The control manufacturer shall furnish all two position relays, capacity relays and all other controls necessary to meet the specifications and provide for a properly operating control system as specified herein. All electric switches and relays shall be UL listed and the type to meet current and voltage requirements of the particular application.

2.8 FLOAT SWITCH: <S><OM>

Provide float switch for all units requiring auxiliary drain pans (i.e. all horizontal units mounted above ceiling). Float switch shall stop the fan upon sensing water in auxiliary drain pan. Float switch shall be equal to Madison Model N8700, 24 volt DC, 30 watts.

PART 3 - EXECUTION

3.1 REQUIREMENTS FOR WORKMANSHIP AND QUALITY:

3.1.1 All wiring shall be terminated by connecting to the temperature control device or numbered terminal strip as indicated on the drawing furnished by the temperature control manufacturer. All wiring shall be color coded and shall be tagged for further identification. Splices in wiring shall be held in an absolute minimum and when necessary shall be made color to color throughout the entire control system.

3.1.2 All switches, panels, etc., furnished and/or installed by the temperature control manufacturer shall be identified by means of plates made of plastic or black anodized aluminum suitably engraved. Embossed or punched plastic tape will not be acceptable.

3.1.3 The Mechanical Contractor shall provide a complete detailed wiring diagram for the air conditioning units to the Electrical Contractor for installation.

3.2 SERVICE AND WARRANTY:

The control system herein specified shall be free from defects in workmanship and material under normal use and service. If within 12 months from date of acceptance by the Owners any of the equipment herein described is proved to be defective in workmanship or material, it shall be replaced or repaired free of any charge to the Owner. Upon completion of the job, the temperature controls shall be thoroughly checked, adjusted and calibrated and placed in operation all devices comprising the entire control system provided under this section of the work to the complete satisfaction of the Engineer and/or owner. The Subcontractor

shall provide the Owner with complete instruction manuals covering the function and operation of all control components on the project. A component technician shall be available for instruction purposes to the Owner.

PART 4 – SEQUENCE OF OPERATION

4.1 SPLIT SYSTEM HEAT PUMP UNITS (AHUs/HPs):

The indoor air handling units shall start/stop through time-of-day scheduling as defined by the central control system. The unit shall operate through its respective controller and shall modulate fan speed and compressor cycling/speed for cooling/heating in order to maintain the desired space conditions through its associated space thermostat.

4.2 EXHAUST FANS

Each toilet room and janitor closet exhaust fan shall be interlocked with its respective room light switch. Sidewall and ventilation fans, where noted or scheduled on the plans, shall be controlled by space thermostat with manual override.

END OF SECTION

SECTION 23 30 00 - HVAC AIR DISTRIBUTION

PART 1 - GENERAL

1.1 GENERAL:

1.1.1 Where any reference to "sheet metal" or "ductwork" appears in this section of these specifications or on the drawings, it shall be construed to include exhaust ducts, relief ducts, plenums, casings for air handling units, duct taps, grille taps and diffuser connections and all other related pieces and parts of the air conveying systems.

1.1.2 Before starting shop drawings or fabrication of any ductwork, the Contractor must have an approved reflected ceiling plan with which he can coordinate location of air outlets, lights, tile patterns, etc.

1.2 SCOPE:

Furnish and install all labor, materials, equipment, tools and services and perform all operations required in connection with or properly incidental to the construction of complete Ductwork and Accessories System as indicated on the drawings, reasonably implied therefrom or as specified herein unless specifically excluded.

1.3 SHOP DRAWINGS:

Shop drawings shall be submitted on all items of sheet metal work only as specified hereinafter.

1.4 REFERENCED STANDARDS:

ASHRAE - Guide and Data Books.
SMACNA - HVAC Duct System Design, Fourth Edition, 2006.
NFPA - 90A, 90B, 91, 96, 204
SMACNA - HVAC Duct Construction Standards, Third Edition, 2005.

1.5 QUALITY ASSURANCE:

The contractor shall comply with this specification in its entirety. If on inspections, the specifier finds that changes have been made without written prior approval, the contractor shall make the applicable changes to comply with this specification, at the contractor's expense.

PART 2 - PRODUCTS

2.1 MATERIAL:

All sheet metal duct, plenum and casing construction, unless otherwise specified herein, shall be constructed of new, prime grade, continuous hot dip mill galvanized, lock forming quality steel sheets, per ASTM A653/A653M and A924/A924M, and shall have a galvanized coating of 1-1/4 ounces total for both sides of 1 sq. ft. of a sheet, in accordance W/G90 per ASTM A653/A653M and ASTM A924/A924M. Construction shall be in strict accordance with the construction details on plan and installation details in the referenced SMACNA and NFPA standards as specified. Referenced standards shall be used to define minimum construction requirements where more stringent standards are not detailed on plans or specified herein.

2.2 LABELING AND GAUGE:

Each sheet shall be stenciled with manufacturer's name and gauge. If coil steel is used, coils shall be stenciled throughout on ten foot (10') centers with manufacturer's name and gauge. Sheet metal must

conform to the tolerances listed in SMACNA HVAC Duct Construction Standards, Third Edition, 2005. All duct systems penetrating 1 hour fire walls shall be of minimum 24 ga. construction.

2.3 LOW PRESSURE DUCTWORK CONSTRUCTION:

2.3.1 Construct low pressure ductwork to meet all functional criteria defined in NFPA 90A, NFPA 90B, and Section VII of the SMACNA "HVAC Duct Construction Standards Metal and Flexible" 2005 Edition. (This shall be subsequently referred to as the SMACNA manual.) All ductwork must comply with all local, state and federal code requirements.

2.3.2 Rectangular low pressure ducts shall be constructed and reinforced for 2"W.G. Longitudinal seams shall be Pittsburg lock, sealed with mastic sealant. (Snaplock is not acceptable.)

Elbows shall be mitered with double thickness turning vanes or smooth radius long sweep elbows. Combination elbows (outside smooth radius with inside miter) are not acceptable.

2.3.3 Round low pressure ducts shall be constructed in accordance with Table 3-2 and 3-3 2" W.G. "Round Duct Gauge Selection" and Figure 3-2 "Transverse Joints-Round Duct" of SMACNA HVAC Duct Construction Standards, Third Edition, 2005 and NFPA 90A and 90B.

Elbows shall be smooth elbows; 5 piece 90 degree elbows or 3 piece 45 degree elbows all with centerline radius 1-1/2 times the duct diameter.

2.3.4 <S> Low pressure flexible ducts shall be in accordance with SMACNA HVAC Duct Construction Standards, Third Edition, 2005, NFPA 90A and 90B. Flexible duct shall be equal to Hart & Cooley FB214, with couplings and end connections as required for proper installation and compatibility with ductwork system in which they are installed.

A. All flexible ducts shall have positive interior air seal permanently bounded to a zinc coated high carbon spring steel helix all sheathed in a Class 1 vapor barrier factory sealed at both ends. The composite assembly including foil faced vapor barrier shall meet the Class 1 requirements of NFPA for use in a return air plenum, and be labeled by Underwriters Laboratories, Inc. 181 with a flame spread rating of 25 or less and a smoke developed rating of 50 or under.

B. Low pressure flexible duct shall be rated to 1 1/2" w.g. working pressure.

C. Flexible duct taps into low pressure plenums or main ducts shall be made with 45 degree side take-offs and rigid round duct with damper on a 3/8" square rod, nylon end bearings, graduated operators with stand-off brackets, and raised bead for tight, positive flex duct connection. Use insulation guard for internally lined ductwork. Duct connections and dampers shall be constructed of galvanized sheet metal, 24 gauge minimum for 12" diameter and smaller, 22 gauge minimum for 14" diameter, and 20 gauge minimum for 15" diameter. Damper assemblies shall be as manufactured by Greenheck or Ruskin.

D. Flexible Duct Clamps: 100 percent nylon strap, 175 pounds minimum loop tensile strength manufactured for this purpose or stainless steel strap with cadmium plated worm gear tightening devise. Apply clamps with sealant and as approved for UL 181, Class I installation.

2.3.5 <S> All exposed low pressure ductwork shall be factory lined, double wall spiral flat oval or spiral round as indicated on plans. Outer duct wall shall be paint-grip galvanized steel suitable for field painting unless noted otherwise. Inner duct wall shall be perforated with mylar liner.

2.4 JOINTS:

2.4.1 All joints shall be sealed airtight with water-based duct sealer equal to United duct sealer in a manner compatible with type joint being sealed. Sealer shall be installed per the instructions set forth in the SMACNA HVAC Duct Construction Standards, Third Edition, 2005.

2.4.2 All sealed ducts shall be pressure tested at a developed and maintained system pressure. Leaks that whistle or are excessive shall be repaired and the test repeated. See Part 3 Execution.

2.4.3 As a Contractor option, transverse duct joints may be made with Ductmate System or approved equal with the following stipulation: "Ductmate or equal system may be employed only after Contractor personnel have been properly instructed by a manufacturer's representative in the application and installation of said system." Duct gauges shall be in strict accordance with Ductmate instructions.

2.5 DUCT SUPPORTS:

2.5.1 All horizontal and vertical ducts shall be supported in accordance with SMACNA HVAC Duct Construction Standards, Third Edition, 2005.

2.5.2 Flexible ducts shall be free of sags and kinks and supported on minimum of 36" centers with 3/4" wide flat banding material. Perforated strap will not be acceptable.

2.6 DUCT LINER:

2.6.1 All supply, return and outside air ductwork as noted on the plans with dashed lines drawn inside the duct, and all ductwork exposed in mechanical rooms shall have integral lining in accordance with SMACNA HVAC Duct Construction Standards, Third Edition, 2005, and NFPA 90A and 90B. Liner shall be 1-1/2 pound per cubic foot, 1" thick.

2.6.2 Dimensions given on the drawings are inside the insulation, sheet metal sizes shall be increased to allow for the thickness of liner called for. Refer to Section 23 05 00 for Flame Spread Properties.

2.6.3 Duct liner shall be equal to Manville "Linacoustic Permacote" meeting ASTM C1071; flexible blanket properly sealed at all joints and bare ends. Adhesive shall be UL listed water proof type. Fasteners shall be galvanized steel pins, welded or mechanically fastened.

2.6.4 Round duct liner shall be equal to Manville "Spiracoustic", or CertainTeed, meeting ASTM C427; Rigid.

2.7 DUCT ACCESS DOORS:

Duct access doors shall be hinged or Ductmate Sandwich Type Access Doors. (1" thick insulation bonded to interior face), 8" x 8" minimum size (duct opening) on ductwork up to 14" and 12" x 12" minimum size on larger ductwork. Doors shall be of adequate size to allow easy access to hardware/equipment that needs to be maintained.

2.8 AIR DISTRIBUTION DEVICES: <S>

2.8.1 Grilles, registers and ceiling outlets shall be as scheduled in the plans and shall be provided with sponge rubber or soft felt gaskets. If a manufacturer other than the one scheduled is used, the sizes shown on the drawings shall be checked for performance, noise level, face velocity, throw, pressure drop etc., before the submittal is made. Selections shall meet the manufacturer's own published data for the above performance criteria. The throw shall be such that the velocity at the end of the throw in the five foot occupancy zone will not be more than 50 FPM or less than 25 FPM. Should grilles other than those scheduled by name be furnished, manufacturer shall be prepared to demonstrate compliance with noise criteria on request to Architect's satisfaction. All devices shall be tested per Air Diffuser Council and labeled as such.

2.8.2 Locations of devices on drawings are approximate and shall be coordinated with other trades to make symmetrical patterns and shall be governed by the established pattern of the lighting fixtures or Architectural reflected ceiling plan. Where called for on the schedules, the grilles, registers and ceiling outlets shall be provided with deflecting devices and manual dampers. These shall be the standard product of the manufacturer, subject to review by the Architect and equal to brand scheduled. All ceiling devices shall be furnished to be compatible with the type ceiling in which they are installed.

2.8.3 Air distribution devices shall be as manufactured by Titus, Metalaire, Krueger or Price only and shall be as scheduled on the drawings.

2.9 INSTRUMENT PORTS:

2.9.1 Instrument ports shall be a 2-5/8" diameter base, neoprene gasket 2" deep neck, screwed cover operated with No. 024 spanner wrench, mounting screws, equal to Young 1101.

2.10 AIR HOODS: <S>

2.10.1 Hood (s) shall be constructed of aluminum rigidly supported to withstand wind forces "oil canning" and normal rough treatment during installation. Units shall be designed and installed to eliminate any standing water. The underside of the hood shall be coated with insulating mastic to prevent condensation.

2.10.2 Provide expanded aluminum mesh birdscreens and a matching 8" high aluminum curb with built-in 3" cant strip and a treated wood nailer installed as indicated on the drawings.

2.10.3 Relief, exhaust and smoke relief outlet hoods shall have a throat-to-hood outlet area ratio of 1 to 1.75 minimum.

2.10.4 Ventilation, outside and combustion air intake hoods shall have a throat-to-hood outlet area ratio of 1 to 1.75 minimum. Intake hoods shall be separated from exhaust outlets, flues, plumbing vent stacks, etc. a minimum of 30 ft. for Health Care facilities and minimum of 15 ft. for all other facilities.

2.10.5 Acceptable manufacturers: Louvers and Dampers, Ruskin, Acme, Greenheck.

2.11 WALL LOUVERS: <S>

2.11.1 Provide 6" thick stationary extruded aluminum louvers with drainable blades. Units shall exactly fit opening and be flashed completely weathertight.

2.11.2 Unless noted otherwise on plan, louvers shall be pre-finished in a color selected by the architect. Coordinate as required.

2.11.3 Maximum free area velocity for intake louvers shall not exceed 900 ft. per minute with a maximum pressure drop of 0.15 inches wg.

2.11.4 Louver blades shall be a minimum .125 inch thick and rigidly bracketed for 20 pounds per square foot wind loading.

2.11.5 Provide accessories as follows:
Aluminum birdscreen in removable frames, extended sill, clip angles and installation hardware.

2.11.6 Acceptable Manufacturers: Ruskin, Greenheck, Empco.

2.12 STAINLESS STEEL DUCTWORK: <S>

Stainless steel used to fabricate Stainless Steel Ductwork Systems shall be 16 GA. type 316L, stainless steel finish 2B (dull).

2.13 FIRE DAMPERS: <S>

2.13.1 Furnish and install UL labeled fire dampers with fusible links where indicated and/or required by local codes in accordance with NFPA 90A and 90B.

2.13.2 Fire dampers shall be 95% minimum free area Ruskin series IBD Classified UL-555.

2.13.3 Where dampers are installed in a horizontal position, provide stainless steel closure springs and cam type blade locks to insure complete damper shut-off.

2.13.4 Fire dampers shall be equipped with suitable frame style for round, oval or rectangular ducts.

2.13.5 Fire dampers shall only be installed in steel grilles, registers and diffusers. Aluminum air distribution devices may not be used in conjunction with fire dampers. It shall be the contractor's responsibility to verify that only steel devices are used with fire dampers.

2.13.6 Acceptable manufacturers: Advanced Air, Ruskin, Air Balance, Airstream Products, Greenheck, Pottorff.

PART 3 - EXECUTION

3.1 WORKMANSHIP, QUALITY AND REQUIREMENTS:

3.1.1 Ductwork shown on the drawings, specified or required for the heating, ventilating and air conditioning systems shall be constructed and erected in a first class workmanlike manner in accordance with SMACNA recommendations for low pressure duct construction unless more stringent requirements are specified herein. This work shall be warranted for a period of one year from the date of acceptance of the job against noise, chatter, whistling or vibrations and free from pulsation under all conditions of operation. After the system is in operation, should these defects occur, they shall either be removed and replaced or reinforced as directed by the Architect.

3.1.2 Ductwork shall be erected in the general locations shown on the drawings, but must conform to all structural and finish conditions of the building. Before fabricating any ductwork, the Contractor shall check the physical conditions at the job site and shall make all necessary changes in cross sections, offsets, etc., whether they are specifically indicated or not.

3.1.3 Provide manually operated volume control dampers in all branches, splits and taps for proper balancing of air distribution whether indicated on the drawings or not. Dampers to be either single blade or multi-blade as shown in the SMACNA manual as required and as detailed on plans. They shall have an indicating device with lock to hold damper in position for proper setting.

3.1.4 Damper operators above inaccessible ceilings shall be furnished with extension rods operable through diffuser and grille faces or from remote locations.

3.1.5 All square elbows shall have double thickness turning vanes per the SMACNA manual requirements except for any return air jumper ducts noted on drawings.

3.1.6 Furnish and install in the ductwork, hinged or Ductmate Sandwich type access doors to provide access to all dampers, automatic dampers, fusible links, cleaning operations, etc. Where the ducts are insulated, the access doors shall be double skin doors with one inch (1") of insulation in the door. Factory fabricated doors as manufactured by Ductmate, Milcor or equal meeting these specifications will be acceptable.

3.1.7 Where ducts connect to mechanical equipment with fans, including roof exhausters, flexible connections shall be made using "Ventglas" fabric that is fire-resistant, waterproof, mildew-resistant and practically air tight and that shall weigh approximately thirty ounces (30 oz.) per square yard. There shall be a minimum of one-half inch (1/2") slack in the connections and a minimum of two and one half inches (2-1/2")

distance between the edges of the duct except that there shall also be a minimum of one inch (1") of slack for each inch of static pressure on the fan system.

3.1.8 Furnish and install screens on all ducts, fans, etc., and openings furnished by this Contractor which lead to, or are, outdoors. Screens shall be 16 gauge, one half inch (1/2") mesh in removable galvanized steel frames.

3.1.9 Furnish test openings with covers in each zone duct for taking readings of air velocities or pressures in ducts. See the SMACNA manual for cover construction.

3.1.10 All holes in ducts for damper rods and other necessary devices, shall be either drilled or machine punched, (not pin punched), and shall not be any larger than necessary. All duct openings shall be provided with sheet metal caps if the openings are to be left unconnected for any length of time. In general, sheet metal screws shall not be used in duct construction unless the head (not the point) of the screw is in the airstream. Transformations shall have a ratio of not more than one inch (1") in transformation to every two inches (2") of length unless specifically shown otherwise on the drawings.

3.1.11 All duct drops to return and exhaust grilles shall be full size of the grille, and internally lined with 1" thick duct liner (except in healthcare facilities). The inside of all grilles, branch ductwork and duct drops shall be "blacked-out" with a minimum of two (2) coats flat black paint.

3.1.12 Ductwork Leakage Criteria:

A. All transverse joints and longitudinal seams shall conform to SMACNA's Class A sealing requirements as defined on pages 1-6 of the 2005 SMACNA Manual, Third Edition.

B. Constant Volume Systems/Supply Ductwork
Allowable Leakage----------1% of design cfm.

C. Constant Volume Systems/Return Ductwork
Allowable Leakage----------2% of design cfm.

D. Total allowable leakage of the system shall not exceed the percentage of design cfm outlined above.

E. Leakage concentrated at one point may result in objectionable noise even if the system passes the leakage rate criteria. This noise source must be corrected to the satisfaction of the engineer.

3.2 DUCT LINER:

A. Adhere insulation to sheet metal with full coverage of a UL listed adhesive.

B. Secure insulation with mechanical liner fasteners as indicated by SMACNA or manufacturer. Pin length should be as recommended by the liner manufacturer.

C. All exposed edges of the liner must be factory or field coated with mastic. For systems operating at 4000 fpm or higher a metal nosing must be installed over all liner leading edges in addition to the mastic coating.

D. Repair liner surface penetrations with UL listed adhesive.

E. Duct dimensions indicated are net inside dimensions required for air flow. Increase duct size to allow for insulation thickness.

3.3 FLASHING:

3.3.1 Where ducts pass through roofs or exterior walls, suitable flashing shall be provided to prevent rain or air current from entering the building. The flashing shall be not less than No. 24 gauge galvanized steel.

3.3.2 Where ducts exposed to view pass through walls, floors or ceilings, furnish and install sheet metal collars to cover the voids around the duct.

3.4 AUXILIARY DRAIN PANS:

Provide 18 gauge galvanized sheet metal auxiliary drain pan under all units mounted above ceiling, and under all units above any finished floor or occupied space in multistory facilities. (including units in mechanical or equipment rooms) Pan shall overhang equipment by 6" in all dimensions. Each pan shall be equipped with a 3/4" nipple soldered in place at the low part of the pan, and a 3/4" quarter-turn drain valve with 3/4" hose thread adapter for emergency draining of pan.

3.5 FIRE DAMPERS:

3.5.1 Fire dampers shall be installed in accordance with the SMACNA recommendations and as detailed on the drawings.

3.5.2 Provide a duct access panel for each fire damper.

3.5.3 Seal wall and floor penetrations with UL approved firestopping material.

END OF SECTION

SECTION 23 35 00 - HVAC EQUIPMENT

PART 1 - GENERAL

1.1 GENERAL:

Refer to Section 23 05 00 for General Requirements for Mechanical Work.

1.2 SCOPE:

Furnish and install all labor, materials, equipment, tools and services and perform all operations required in connection with, or properly incidental to, the construction of complete air conditioning equipment systems as indicated on the drawings, reasonably implied therefrom or as specified herein unless specifically excluded.

1.3 SCHEDULES ON DRAWINGS:

In general, all capacities of equipment and motor and starter characteristics are shown on schedules on the drawings. Reference shall be made to the schedules for such information. The capacities shown are minimum capacities. Variations in the characteristics will be permitted only on written approval of the Architect. Insofar as is possible, all items of the same type (i.e., air handling units, fans, etc.) shall be by the same manufacturer. Where instructions on installation are not included on these specifications or on the plans, the manufacturer's instructions shall be followed. Equipment shall be labeled and provided with installation and operating instructions in accordance with International Mechanical Code.

1.4 EQUIPMENT INSTALLATION AND WARRANTY SCHEDULE:

1.4.1 This Subcontractor shall refer to the architectural specifications for the required time schedule for the installation of equipment furnished as a part of this contract. The required time schedule will necessitate the setting-in-place of some items before the normal period of occupancy of the space and before the acceptance of substantial completion and subsequent approval by the Owner and Architect. The Subcontractor is advised that the warranty for each item of equipment will not begin until the documented time of beneficial use as defined in the architectural specifications, and the Subcontractor will, therefore, make the necessary arrangements with the equipment manufacturers for extended warranties as may be required.

1.4.2 All exterior equipment shall be provided with factory finished and fabricated, fully louvered coil guards completely enclosing coils preventing damage from outside sources. Wire screens or mesh are not acceptable. Where factory fabricated guards are not available, provide 300 series stainless steel, shop fabricated guards shall be provided.

1.5 REFERENCED STANDARDS:

ASHRAE Handbook - HVAC Applications (latest edition)
ASHRAE Handbook - HVAC Systems & Equipment (latest edition)
ASHRAE Handbook - Fundamentals (latest edition)
Standard for Mechanical Refrigeration Systems - ANSI B9.1
Standard for Installation of Air-Conditioning & Ventilating Systems - NFPA 90A
International Mechanical Code - IMC
Reference SECTION 23 05 00 for additional information

PART 2 - PRODUCTS

2.1 FILTERS: <S> <OM>

2.1.1 To protect the air-moving equipment during construction and for the purpose of testing and balancing, this Contractor shall furnish and install a complete set of temporary filters. These temporary filters shall be of glass fiber in heavy cardboard frame with suitable retainers to hold the media in place. Provide four (4) complete sets of each type of filter for each piece of air moving equipment, in addition to "start-up" filters.

2.1.2 For all other air moving equipment permanent filter type shall be 2" thick MERV 8 efficient pleated throw-away filters. Final Filters where specified shall be 2" thick MERV 11.

2.1.3 For filter return grilles, filters shall be equal to 1" thick Farr 30/30 MERV 7 efficient pleated throw-away filters.

2.1.4 Acceptable Manufacturers: Farr, Air Guard, AFF.

2.2 MOTOR STARTERS: <S> <OM>

2.2.1 Starters shall be NEMA approved magnetic, line voltage type for motors up through 5 HP and solid state, soft start type for motors greater than 5 HP with overload relays in each phase, phase loss protection and phase unbalance protection. Each starter will be provided with pilot light on H-O-A switch.

2.2.2 Interlocks as required, plus one (1) spare, shall be provided for each starter. Holding coils shall be 120V AC from an individual control power transformer.

2.2.3 Motor starters shall be provided for all motors 1 HP and above and all motors requiring automatic control, unless indicated otherwise on the plans.

2.3 EXHAUST FANS: <S> <OM>

2.3.1Ceiling and in-line exhaust fans shall be equal to Greenheck Model SP/CSP and as scheduled on the drawings. The fan housing shall be constructed of heavy gauge galvanized steel, acoustically lined with 1/2 inch thick insulation. The motor shall be mounted on resilient elastic grommets. The fan shall have a forward curved centrifugal wheel. All fans shall bear the AMCA seal for air and sound performance, and shall be U.L. 702 listed and labeled. Provide high strength molded polystyrene integral grille for ceiling mounted fans.

2.3.2 Roof exhausters shall be of the direct-driven centrifugal type as manufactured by Greenheck or equal and have capacity as scheduled on the drawings. The fan shall be complete with a weather-proof protection for fans and motors, centrifugal type wheels, automatic shutter, non-fused disconnect switches, birdscreens and suitable motor guards. The fans shall be supplied with insulated factory fabricated roof curb. All fans shall bear the AMCA seal for air and sound performance, and shall be U.L. 702 listed and labeled.

2.3.3 Sidewall propeller fans shall be direct drive equal to Greenheck AER with capacities as scheduled on the drawings. Provide closure angles/mounting angles, backdraft damper, disconnect switch, long wall housing, flush exterior, OSHA guard, damper guard, and on/off toggle switch.

A. The propeller shall be constructed with fabricated steel, fabricated aluminum, or cast aluminum blades and hubs. Propellers shall be securely attached to fan shafts. Propellers assembly shall be dynamically and statically balanced.

B. Shaft shall be ground and polished steel with slotted keyways. Shaft bearings shall be pillow block type with heavy duty sealed permanently lubricated ball bearings.

C. Fan panel shall be galvanized or painted steel with deep formed inlet venturi, formed flanges, and welded corners. Panel shall have prepunched mounting holes.

D. Drive shall be sized for a minimum of 150% of driven horsepower. Drive frames shall be formed channels.

E. All steel components shall be factory coated with thermally fused powdered epoxy. Coating shall be minimum 4-5 mils thick.

F. All fans shall bear the AMCA seal for air and sound performance.

2.3.4 Alternate fan manufacturers: Cook, Penn, Acme.

2.4 AIR PURIFICATION SYSTEMS: <S> <OM>

2.4.1 GENERAL DESCRIPTION

A. Codes and Standards. The following codes and standards are referenced throughout. The edition to be used is that currently enforced by the authority having jurisdiction (AHJ) or in absence of such direction that referenced by the current enforceable IBC code or as indicated by the contract documents, except where specifically referenced by this section of the specifications.

1. ASHRAE Standards 62 & 52
2. National Electric Code NFPA 70
3. UL 86-2007 including ozone chamber test required as of December 21, 2007
4. The cold plasma equipment and power supply shall be UL and CE listed.
5. The technology shall have been tested to DO-160 by an independent lab and successfully passed all requirements for shock, vibration, EMF and line noise. Manufacturers not tested to DO-160 shall not be acceptable.

B. Quality and IP Assurance

1. Acceptable manufacturers: Global Plasma Solutions, Phenomenal Aire, Atmos Aire. All other manufacturers requesting prior approval must submit product drawings, specifications and test results specified in section 2.2 at least two weeks prior to bid date.
2. The Air Purification System shall be a product of an established manufacturer within the USA. Direct Current (DC) Ion modules manufactured outside the USA and assembled in the USA on mounting plates shall not be acceptable.
3. A qualified representative from the manufacturer shall be available to inspect the installation of the air purification system to ensure installation in accordance with manufacturer's recommendation.
4. Technologies that do not address gas disassociation such as UV Lights, Powered Particulate Filters and/or polarized media filters shall not be considered. Uni-polar ion generators shall not be acceptable. "Plasma" particulate filters shall not be acceptable. Any system containing titanium dioxide (Ti02), which has been listed by the CDC as a known carcinogen, shall not be acceptable.
5. The Air Purification Technology shall have been tested by UL or Intertek/ETL to prove conformance to UL 867-2007 including the ozone chamber testing and peak ozone test for electronic devices. Manufacturers that achieved UL 867 prior to December 21, 2007 and have not been tested in accordance with the newest UL 867 standard with the ozone amendment shall not be acceptable. All manufacturers requesting prior approval shall submit their independent UL 867 test data with ozone results to the engineer for preliminary review and during the submittal process. All manufacturers shall submit a copy with their quotation. Contractors shall not accept any proposal without the proper ozone testing documentation.
6. The maximum allowable ozone concentration per the UL 867-2007 chamber test shall be 0.007 PPM. The maximum peak ozone concentration per the UL 867-2007 peak test as measured 2 inches away from the electronic air cleaner's output shall be no more

than 0.0042 PPM. Manufacturers with ozone output exceeding these ozone values shall not be acceptable.

C. Submittals

1. Product Data: Submit manufacturer's technical product data for ion generators including:
   a. Schedule of plasma generators indicating unit designation, number of each type required for each unit/application.
   b. Data sheet for each type of plasma generator, and accessory furnished; indicating construction, sizes, and mounting details.
   c. Performance data for each type of plasma device furnished.
   d. Product drawings detailing all physical, electrical and control requirements.
   e. Copy of UL 867 independent ozone test.
   f. Statement on the manufacturer's letterhead stating that the technology contains no titanium dioxide (Ti02).

2. Operating & Maintenance Data: Submit O&M data and recommended spare parts lists.

D. PRODUCT DELIVERY, STORAGE AND HANDLING

Deliver in factory fabricated shipping containers. Identify on outside of container type of product and location to be installed. Avoid crushing or bending. Store in original cartons and protect from weather and construction work traffic. Store indoors and in accordance with the manufacturers' recommendation for storage.

E. WARRANTY

Equipment shall be warranted by the manufacturer against defects in material and workmanship for a period of eighteen months after shipment or twelve months from owner acceptance, whichever occurs first. Labor to replace equipment under warranty shall be provided by the owner or installing contractor.

2.4.2 GENERAL

A. The air purification system(s) shall be of the size, type, arrangement and capacity indicated and required by the unit furnished and shall be of the manufacturer specified.

B. All other Suppliers of comparable products requesting prior approval shall:
   1. Submit for prior approval in accordance with the requirements of Section 15010.
   2. In addition, manufacturers submitting for prior approval for Bi-Polar Ionization must as part of the prior approval request provide their ASHRAE 62.1-2007 calculations that prove conformance to the ASHRAE Standard with the reduction of outside air to the scheduled values. A letter on the manufacturer's letterhead requesting prior approval must accompany the request for prior approval stating their calculations are ASHRAE compliant. A third party validation study performed on a previous installation of the same application using the same make and model equipment shall also be included.
   3. Submit independent test data from ETL or UL showing ozone levels produced during the UL 867 ozone chamber test. Manufacturers without this test data shall not be acceptable.
   4. Submit pathogen testing per section 2.2.
   5. Submit at least two other end user references in the same application with contact phone number, email, equipment used and application for the equipment at that facility. Manufacturers not having the above references in similar applications using the same equipment models as proposed on the current project shall not be acceptable.
   6. Ionization bars manufactured using DC output ionization modules shall not be permitted due to corrosion, ion short-circuiting, intermittent coil coverage and shock hazard.

7. Ionization bars manufactured using ion modules not having epoxy coating all circuit boards and internal components shall not be acceptable.
8. Manufacturers submitting as an alternate shall include their DO-160 test results.
9. It is the responsibility of any alternate manufacturer and mechanical contractor proposing an alternate to the basis of design to confirm any proposed substituted product does not infringe on the patented intellectual property of the basis of design. The engineer and owner recognize the basis of design holds multiple patents and multiple patents are pending.

2.4.3 BI-POLAR IONIZATION DESIGN & PERFORMANCE CRITERIA

A. Each piece of air handling equipment, so designated on the plans, details, equipment schedules and/or specifications shall contain a Plasma Generator with Bi-polar Ionization output as described here within.

B. The Bi-polar Ionization system shall be capable of:
1. Effectively killing microorganisms downstream of the bi-polar ionization equipment (mold, bacteria, virus, etc.).
2. Controlling gas phase contaminants generated from human occupants, building structure, furnishings and outside air contaminants.
3. Capable of reducing static space charges.
4. Effectively reducing space particle counts.
5. When mounted to the air entering side of a cooling coil, keep the cooling coil free from pathogen and mold growth.
6. All manufacturers shall provide documentation by an independent NELEC accredited laboratory that proves the product has minimum kill rates for the following pathogens given the allotted time and in a space condition:
   A. MRSA - >96% in 30 minutes or less
   B. E.coli - > 99% in 15 minutes or less
   C. TB - > 69% in 60 minutes or less
   D. C. diff - >86% in 30 minutes or less
   E. Noro Virus -> 93.5% in 30 minutes or less
   F. Legionella -> 99.7% in 30 minutes or less

   Manufacturers not providing the equivalent space kill rates shall not be acceptable. All manufactures requesting prior approval shall provide to the engineer independent test data from a NELAC accredited independent lab confirming kill rates and time meeting the minimum requirements stated in section 2.2 B, points 6A, 6B and 6C. Products tested only on Petri dishes to prove kill rates shall not be acceptable. Products being sold under different trade names than those tested shall not be acceptable.
7. Capable of modular field assembly in six inch (150mm) sections.

C. The bi-polar ionization system shall operate in a manner such that equal amounts of positive and negative ions are produced. Uni-polar ion devices shall not be acceptable. All ionizers provided shall be AC type ionizers with one electrode pulsing between positive and negative.
1. Air exchange rates may vary through the full operating range of a constant Volume or VAV system. The quantity of air exchange shall not be increased due to requirements of the air purification system.
2. Velocity Profile: The air purification device shall not have maximum velocity profile.

D. Humidity: Plasma Generators shall not require preheat protection when the relative humidity of the entering air exceeds 85%. Relative humidity from 0 - 100%, condensing, shall not cause damage, deterioration or dangerous conditions within the air purification system. Air purification system shall be capable of wash down duty.

E. Equipment Requirements:

1. Electrode Specifications (Bi-polar Ionization):
   a. Each flexible ionization bar with Bi-polar Ionization output shall include a minimum of six carbon fiber cluster ion needles per foot of coil face width shall be provided. The entire cooling coil width shall have equal distribution of ionization across the face. Systems without ion needles at least 2.0" apart shall not be acceptable. All hardware required for mounting shall be provided by the air purification manufacturer. Bi-polar ionization tubes manufactured of glass and steel mesh shall not be acceptable due to replacement requirements, maintenance, and performance output reduction over time, ozone production and corrosion.
   b. Electrodes shall be provided in 36.0" sections with high temperature double sided tape, and the power head shall be epoxy filled
   c. Electrodes shall be energized when the main unit disconnect is turned on.
   d. The ionization output shall be a minimum of 240 million ions/cc over the entire width of the 36" ion strip as measured 1 inch from the cold plasma needles.

F. Air Handler Mounted Units:

1. Where so indicated on the plans and/or schedules Plasma Generator(s) shall be supplied and installed. The mechanical contractor shall mount the Plasma Generator and wire it according to the manufacturers IOM. A 115VAC or 208-240VAC circuit shall be provided to the plasma generator power supply. No more than 5 watts shall be required per power supply

G. Plasma Requirements:

1. Plasma Generators with Bi-polar ionization output shall be capable of controlling gas phase contaminants and shall be provided for all equipment listed above.
   a. The Bi-polar ionization system shall consist of Bi-Polar Plasma Generator and power supply. The Bi-polar system shall be installed where indicated on the plans or specified to be installed. The device shall be capable of being powered by 115VAC or 208-240VAC without the use of an external transformer. Ionization systems requiring isolation transformers shall not be acceptable.
   b. Ionization Output: The ionization output shall be controlled such that an equal number of positive and negative ions are produced.
   c. Ionization output from each flexible electrode shall be a minimum of 240 million ions/cc when tested at 1".
   d. Each plasma electrode shall be made from Kapton tape.

H. Electrical Requirements:

2. Wiring, conduit and junction boxes shall be installed within housing plenums in accordance with NEC NFPA 70. Plasma Generator shall accept an electrical service of 115 VAC or 208-240VAC, 1 phase, 50/60 Hz. The contractor shall coordinate electrical requirements with air purification manufacturer during submittals.

I. Control Requirements:

3. All Plasma Generators shall have internal short circuit protection, overload protection, and automatic fault reset.
4. The Plasma Generator power supply shall have internal circuitry to sense the ionization output and provide dry contact alarm status to the BMS when specified on the schedule.
5. The installing contractor shall mount and wire the Plasma device within the air handling unit specified or as shown or the plans. The contractor shall follow all manufacturer IOM instructions during installation.

2.6 SPLIT SYSTEM HEAT PUMPS – (5 TONS AND UNDER): <S> <OM>

Furnish and install a heat pump system comprised of an indoor unit and outdoor air source heat pump condensing unit(s) of the size and capacity shown on the equipment schedules.

Indoor-outdoor components shall be designed for compatibility and shall be rated in accordance with applicable ARI Standards.

Furnish and install direct expansion air cooled heat pump outdoor units of the type, number and configuration shown on the plans. Each unit shall be a complete factory package consisting of compressor, outdoor coil, outdoor fans and motors, casing and refrigeration and temperature controls. Units shall be designed for vertical discharge with side intake and shall contain a holding charge of R32 or R454B refrigerant. Casing shall be fully weatherproof type designed for outdoor installation only. Casing shall be of galvanized steel, zinc phosphatized with a baked enamel finish and shall include louvered hail guards. (Wire screens are not acceptable.) Removable panels shall provide complete access for servicing compressor(s) and electrical controls.

Outdoor coil shall be constructed with aluminum fins mechanically bonded to non-ferrous tubing. Coil shall be protected by powder coated grille. Factory-installed coil refrigerant metering device shall be mounted on unit liquid service valve. Metering device internal for cleaning or replacement. Outdoor unit fan shall be propeller type, direct driven, and arranged for vertical air discharge. Fan motor shall be factory lubricated, inherently protected and resiliently mounted.

Compressor shall be of the welded-hermetic type with internal vibration isolation and shall be covered with a shield to muffle operating sound. Compressor motor shall have both thermal and current-sensitive overload device, and start assist device shall be standard. Compressor shall be equipped with a crankcase heater, have internal high-pressure, low-pressure controls, and 5-minute time delay to prevent compressor short cycling. Provide low ambient kit to 20°F with winter start control and evaporator freezestat. Compressors shall be provided with 5 year manufacturer's replacement warranty.

Controls shall be factory wired and located in a readily accessible location on unit control ring. Controls and protective devices shall include a liquid line low-pressure switch, suction line accumulator and pressure relief device. An automatic defrost control shall be included to accomplish defrosting (only if coil saturated suction temperature indicates freezing temperatures) every 90 minutes for a period of not more than 10 minutes. Control wiring terminal board shall be designed to match indoor unit terminal board and accessory thermostat terminals for standardized point-to-point connection.

Furnish and install a direct expansion heat pump circuited fan coil. Unit enclosure shall be insulated and constructed of cold-rolled steel, bonderized and finished with baked enamel. Large front service access panels shall provide easy access to all components. Provide permanent type filter frame for field-supplied 2-inch thick throwaway filters. Where factory 2-inch filter frames are not available within the unit, filter housings shall be factory installed on the return air inlet connections of each unit. Housings shall be constructed of 20 gauge galvanized steel with hinged access panel and frame for 2-inch filters. Fan shall be forward curved with double inlet, mounted on motor shaft, dynamically and statically balanced. The fan motor shall be factory lubricated, have internal overload protection and be resiliently mounted. Fan motor assembly shall slide out for service. Cooling coil shall be constructed with aluminum plate fins mechanically bonded to nonferrous tubing with all joints brazed. Coil shall have factory installed: refrigerant metering device, refrigerant line fittings which permit mechanical connections and condensate pan with drain connection.

Auxiliary electric heater shall be (factory) installed, shall be equipped with thermal overload device and the required heating and cooling system controls including 60VA control circuit (24V) transformer. Low voltage connections shall be point-to-point on terminal board.

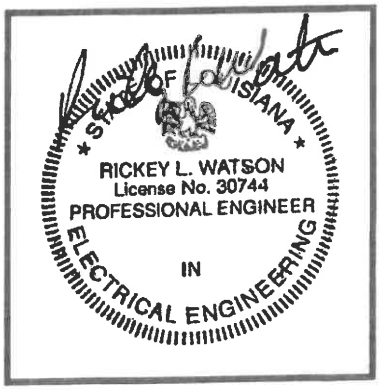
Acceptable manufacturers: Trane, Carrier, Lennox, York, McQuay.

PART 3 - EXECUTION

All equipment shall be installed strict accordance with manufacturer's instructions, maintaining all required access and service clearance.

END OF SECTION

DIVISION 26
ELECTRICAL



DIVISION 26 - ELECTRICAL

SECTION 26 04 00 - GENERAL PROVISIONS

PART 1 - GENERAL

1.1 SCOPE:

The scope of the electrical phase of this project shall include all labor, materials, equipment, etc., required to fulfill the intent of the Contract Documents and shall include the work specified under the following sections:

DIVISION 26-ELECTRICAL

SECTION 26 05 00-COMMON WORK RESULTS FOR ELECTRICAL
SECTION 26 05 03-EQUIPMENT WIRING CONNECTIONS
SECTION 26 05 19-LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
SECTION 26 05 26-GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
SECTION 26 05 29-HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
SECTION 26 05 33-RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
SECTION 26 05 34-FLOOR BOXES FOR ELECTRICAL SYSTEMS
SECTION 26 05 53-IDENTIFICATION FOR ELECTRICAL SYSTEMS
SECTION 26 09 23-LIGHTING CONTROL DEVICES
SECTION 26 20 00-LOW-VOLTAGE ELECTRICAL TRANSMISSION
SECTION 26 27 26-WIRING DEVICES
SECTION 26 50 00-LIGHTING

DIVISION 27-COMMUNICATION

SECTION 27 05 00-COMMUNICATIONS SYSTEMS
SECTION 27 05 33-CONDUIT AND BACK BOXES FOR COMMUNICATION SYSTEMS

1.2 RELATED DOCUMENTS:

All applicable provisions of Division 00 and 01 govern work under this division. Refer to these articles in the specifications for additional information.

1.3 REFERENCED STANDARDS:

A. All work shall be performed in accordance with the latest editions of the applicable state, national and local ordinances, building codes and the National Electric Code.
B. Refer to each section for applicable codes and reference standards.

1.4 FEES, PERMITS AND TAXES:

A. This Contractor shall make arrangements for and pay for all inspection fees and permits required by the local authorities. The Contractor shall also pay all taxes levied for labor and materials associated with work under this Division.

1.5 SUBMITTALS:

A. The symbol "<S>" indicates a requirement for submittals.

B. Shop drawings, manufacturer's data materials lists, etc., are required for all equipment and material where submittals are required.

C. Refer to "General Conditions" and/or "Instructions to Bidders" for additional information on submittals.

D. As a minimum, submittals shall be presented from published manufacturer's data and in such a form that the Architect can readily verify compliance with codes, standards, and the Contract Documents including construction features, rough-in requirements, etc. Each submittal shall contain data relevant to the particular equipment (including options). The data shall be identified by "hy-liteing", arrows, underlining, etc. Do not submit pages of non-relevant information. Broad general data is not acceptable. If equipment submitted is not as specified in the Contract Documents, then the submittal shall contain specific details prominently identifying any differences in form, fit or function. If the equipment submitted is not as specified, then the Contractor shall be responsible for any additional costs necessary to install and connect the equipment. This includes, but is not limited to, increased panelboard size, circuit breaker size, disconnect size or circuit size. Submit dimensional layout of all electrical equipment locations, drawn to scale, with equipment locations shown. Clearances shall be in accordance with NEC and local codes. Panelboard and switchgear submittals will be rejected without dimensioned room or equipment location layouts.

1.6 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTIONS:

A. The symbol "<OM>" indicates that operating and maintenance manuals are to be furnished.

B. Each operating and maintenance manual shall apply specifically to the equipment installed. In those cases where one manual covers a general class of equipment, the contractor shall be required to identify (hy-liteing, underlining, etc.) those portions which apply to the installed equipment. All operating and maintenance manuals shall be available for inspection by the Architect/Engineer at the final review. Do no submit operating and maintenance manuals unless specifically requested.

C. Provide (2) two copies of operating and maintenance manuals. Manuals shall be bound in large ring loose-leaf binders and contain the following:
   1. Manufacturer's instructions and/or installation manual.
   2. Additional items that may be required in Division 00 and 01.

1.7 PRIOR APPROVAL:

Where the contractor wishes to substitute equipment or materials under an "or equal" clause, he shall submit to the Architect in writing seven (7) work days prior to bid opening lists of proposed substitutions which, from published manufacturer's data, cover the salient features of the proposed substitution. Approvals will be issued in writing.

1.8 WARRANTY:

This Contractor shall guaranty fully all workmanship, material, equipment, systems, etc., provided by him for a period of one year after substantial completion of the project. The use of building equipment for temporary service and testing does not constitute the beginning of the warranty. This guaranty means that this Contractor shall make good to the owner, at no cost, any defects that become apparent during the year following substantial completion. This guaranty is in addition to any other guaranties or warranties and is not intended to limit such other guaranties or warranties.

1.9 DEFINITIONS: The following words and phrases are hereby defined:

A. "provide": Furnish and install all material and labor required for a complete installation ready for operation in accordance with the intent of the Contract Documents.

B. "as required": Indicates that the contractor shall perform the work or provide the material as indicated in accordance with manufacturer's installation instructions and in accordance with applicable codes or regulations.

C. "or equal": Indicates that the contractor may substitute equipment by another manufacturer if the salient features of the equipment indicated by manufacturer's name and/or described are, in the judgment of the Architect, adequate. See article PRIOR APPROVAL.

D. "contractor": Where the word(s) "contractor" or "this contractor" is used herein it refers to the contractor engaged to execute the work under this division of the specifications only, even though he may be technically described as a sub-contractor.

E. "intent of the Contract Documents": The specific intent of these documents is to provide to the owner, in a thoroughly functional condition, all the various systems, equipment. etc., indicated herein. Final interpretation of the "intent" shall rest with the Architect.

F. "shall": Indicates a mandatory requirements.

1.10 INSPECTION OF THE SITE:

A. The drawings are prepared from the best information available and reflect all conditions commensurate with this information. However, the contractor should visit the site prior to submitting a proposal and should verify the locations, sizes, depths, pressures, etc., of all utilities and familiarize himself with working conditions, hazards, grades, soil conditions, obstructions, etc. If it becomes evident that site conditions will impair the proper operation of the utilities, the Architect shall be notified in writing.

B. All proposals shall take these conditions and any revisions required into consideration, and the lack of specific site information on the drawings shall not relieve the contractor of any responsibility.

1.11 CONSTRUCTION SAFETY:

This Contractor assumes all responsibility for the safety of his personnel on the project during construction. The Contract Documents do not include materials, procedures, components, etc., required to insure construction safety. Refer to General Conditions for additional information.

1.12 DAMAGE:

A. This Contractor shall be responsible for damage to the project caused by this Contractor's failure to recognize hazards associated with items such as lack of power, scheduling of work (tardiness), inexperienced workmen, excessive cutting, etc. This Contractor shall repair at no expense to the owner any such damage.

B. This Contractor shall familiarize himself with working conditions to the extent that he shall be responsible for damage to concealed piping, wiring and other equipment meant to remain, and shall repair any damage caused by his negligence at no cost to the owner.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 WORKMANSHIP:

A. All work shall be done by experienced craftsmen skilled in the applicable trade.

B. Unprofessional and incomplete work shall be rejected and corrected at no additional expense. The judgement of professionalism and completeness of work shall be made by the architect/engineer and shall be final.

3.2 MANUFACTURER'S INSTALLATION INSTRUCTIONS:

All equipment shall be installed in strict compliance with manufacturer's installation instructions.

3.3 PROTECTION OF EQUIPMENT:

The Contractor shall continuously maintain adequate protection of stored materials and installed equipment. Fixtures and equipment, whether located inside or outside, shall be tightly covered with sheet polyethylene or waterproof tarpaulin as protection against dirt, rust, moisture and abuse from other trades. Adequate air circulation shall be provided under any protective sheet to prevent condensate build up. Materials and equipment shall not be stored where it can come into direct contact with the ground. Conduit, conduit hangars, cable tray and equipment shall not be used by other trades as supports for their equipment, scaffolds or personnel. At the completion of the work, equipment, fixtures, exposed supports and piping shall be cleaned of loose dirt, construction debris, overspray, etc., to the satisfaction of the Architect. Repairs made necessary by damage shall be paid for by the Contractor.

3.4 CONFLICTS, INTERFERENCES AND COORDINATION BETWEEN TRADES:

A. The drawings are not to be construed as shop drawings but indicate the extent, general locations, arrangement, etc., of conduit systems and equipment. Electrical drawings are diagrammatic and shall not be scaled for exact size. If the contractor has any questions regarding the layout of a particular device or equipment item he shall contact the architect for clarification. This Contractor shall, in laying out his work, refer to other sections of the specifications and other drawings such as air conditioning, structural, plumbing, architectural, etc., in order to eliminate conflicts and undue delays in the progress of the work. See article CUTTING AND PATCHING for additional coordination required. Where items are furnished by other trades require connections by this Contractor, they shall be held responsible for providing rough-in drawings and assistance upon request.

B. In the event of interferences, piping or equipment requiring set grades or elevations shall have precedence over conduit, lighting, outlet boxes, air conditioning, ductwork, etc.

C. Plans, specifications and other documents have been prepared and developed with reasonable professional care and coordination. It is the intent that all documents are supportive and complimentary, one to the other; and as such what is required by one shall be considered as required and binding as if indicated by all. Work indicated shall include, regardless of whether or not specifically stated, such supportive or required items or work as consistent with what is indicated, is reasonably inferable from what is indicated, and/or is common construction procedure or knowledge with regard to what is indicated.

D. In the event of conflict between codes as interpreted by the authority having jurisdiction, and the contract documents, the codes shall govern.

E. In the event of a conflict between manufacturer's installation instructions and the drawings, the manufacturer's installation instructions shall govern.

F. Should discrepancies be found between the documents and/or an interpretation is required, and a decision or interpretation to the contractor is not rendered by the Architect, it shall be assumed the contractor has reviewed all the documents to find the most costly method or items in question which then shall be required. One document does not take precedence over another when interpreting a discrepancy.

3.5 CUTTING AND PATCHING:

A. All cutting required by the installation of sleeves, conduit, equipment, etc., shall be coordinated with the General Contractor, but performed by this Contractor. Patching shall be by General Contractor.

This Contractor shall not cut any structural element or any finished work without written permission from the Architect.

B. This Contractor shall cut and patch all paving as required by the installation of buried conduit or wire.

3.6 CONCRETE WORK:

This Contractor shall provide all forming, reinforcing and concrete as indicated such as equipment bases, transformer pads, etc. Work shall conform to the applicable portion of Division 03 CONCRETE.

3.7 PAINTING:

A. All painting except "touch-up" shall be provided under the painting section (Division 9) unless noted otherwise. All exposed conduit, equipment, etc., shall be left clean and free from rust or grease and ready for the painter.

B. Where equipment finishes are damaged, this Contractor shall obtain touch-up paint in matching colors from the equipment manufacturer and paint as required.

3.8 TRENCHING AND BACKFILL:

A. This Contractor shall perform all trenching, excavation, shoring, pumping and backfill required in the installation of his work. All trenches shall be maintained dry until all circuits have been satisfactorily tested (see paragraph TEST) and then filled in tamped 6" layers immediately after approval of tests by the Architect. All backfill shall be free of construction debris and any other foreign material which might damage any circuit runs. Stability of backfilled soil shall match adjacent undisturbed soil.

B. All exterior raceway or cable shall be laid with at least a minimum cover as indicated in the National Electrical Code.

C. The contractor shall exercise all possible care to avoid damage to trees and roots in excavation. Where possible, the contractor shall excavate beyond the drip line of trees. If it is necessary to cut roots 1" to 2 1/2" in diameter, the contractor shall excavate around, cut clean and paint severed ends of roots with a tree wound sealer. Do not cut roots 2 1/2" and larger.

3.9 EQUIPMENT CONNECTIONS:

A. This Contractor shall bring all required electrical service to all equipment items furnished under other sections of these specifications or by the owner, make final connections, and leave equipment ready for operation. This Contractor shall coordinate with any affected trade to assure correct operation of the equipment item, i.e., phase rotation, switching, control location and accessibility.

B. When the contractor is uncertain about the method of installation, proper location, etc., he shall ask for further instructions or details. Failure to request such information will not excuse non-compliance.

C. All roof mounted mechanical equipment shall be served through curb. If not possible, then contractor shall notify the architect in writing providing a no cost alternative.

3.10 CONTROL AND INTERLOCK WIRING:

A. Except as otherwise indicated on the drawings, details of control wiring for work under the Mechanical Section are not shown. Control systems, components and control and interlock wiring for mechanical equipment will be furnished under Division 23. Control devices including, but not limited to, thermostats, fan speed and level control switches, relays and electro-pneumatic switches shall be furnished under Division 23. Motor control centers, magnetic starters and normal motor starters shall be provided under Division 26 unless noted to be provided with mechanical equipment in Division 23.

B. Power wiring to starters, relays and contactors shall be under Division 26. Power wiring to magnetic starters shall consist of wiring to the line side terminals of the magnetic starter or contactor and wiring away from the load side terminals to the equipment, except where such wiring is installed pre-wired by the equipment vendor such as for rooftop air conditioning units.

1. Power wiring to 120 volt-1 phase-60Hz and 277 volt-1 phase-60Hz fans, unit heaters, fan-coil units and pumps shall include all portions of the branch circuit, except wiring inside an automatic temperature control panel (ATC) or Direct Digital Control Panel (DDC) or magnetic starter. Such internal wiring shall be furnished under Division 23.

Under Division 26:

1. Furnish duct mounted smoke detectors.
2. Provide wiring among detectors, fire alarm system, magnetic starters and relays, ATC panels and DDC panels.
3. Install line voltage components.
4. Circuiting to line voltage safety devices, i.e. vibration sensors on cooling towers.

C. The Electrical Subcontractor shall install all starters, pilot switches, control devices and miscellaneous items of electrical equipment furnished under other sections of these specifications that are not integrally mounted with their associated equipment.

D. The definition of control wiring for this specification is wiring that does not supply utilization energy and is generally below 120 volts. This wiring (control wiring) is to be provided under Division 23. Power wiring is typically branch or feeder circuiting that terminates in an electrical outlet that supplies utilization energy for machines or other electrical equipment. This voltage is generally 120 volts or greater and is provided under Division 26. No subsequent allowance will be made because of error or failure to obtain necessary information to completely estimate and perform work associated with the control system.

3.11 FLASHING AND WATERPROOFING:

All building penetrations to the outside shall be flashed and counter-flashed as required to eliminate leaks.

3.12 TESTS:

All circuit and operational tests of the electrical systems shall be made by this Contractor and repeated until approved by the Architect. Conduit systems shall not be covered or otherwise concealed until review has been made and approvals obtained from the Architect. Notify the Architect four days prior to tests to allow for scheduling.

3.13 CLEAN-UP:

Where all work has been finally tested, this Contractor shall clean all work installed by him, including all fixtures, equipment, and all exposed work.

END OF SECTION

SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 SUMMARY

A. Section includes grounding electrodes and conductors; bonding methods and materials; conduit and equipment supports, anchors and fasteners; and nameplates and wire markers.

1.2 SYSTEM DESCRIPTION

A. Grounding systems use metal underground pipe, metal frame of building and driven ground rod as grounding electrodes. Grounding system connections use mechanical fasteners and exothermic welds.

B. Select materials, sizes, and types of anchors, fasteners, and supports to carry loads of equipment and raceway, including weight of wire and cable in raceway. Anchor and fasten electrical products to building elements and finishes as follows:

1. Concrete Structural Elements: Expansion anchors and preset inserts.
2. Steel Structural Elements: Beam clamps, spring steel clips, and welded fasteners.
3. Concrete Surfaces: Self-drilling anchors and expansion anchors.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Toggle bolts.
5. Solid Masonry Walls: Expansion anchors and preset inserts.
6. Sheet Metal: Sheet metal screws.
7. Wood Elements: Wood screws.

C. Identify Electrical components as follows:
1. Nameplate for each electrical distribution and control equipment enclosure.
2. Wire marker for each conductor at panelboards, pull boxes, and outlet and junction boxes.

1.3 SUBMITTALS <S>

A. Product Data: Submit manufacturer's catalog data for grounding electrodes and connections; for fastening components; and nameplates, labels, and markers.

PART 2 PRODUCTS

2.1 ROD ELECTRODES <S>

A. Manufacturers:

B. Product Description: Copper or copper-clad steel, 3/4 inch diameter rod electrode, 10 feet in length.

2.2 NAMEPLATES

A. Product Description:Engraved three-layer laminated plastic nameplate, black letters on white background. Attach with stainless steel fasteners.

B. Letter Size:
   1. 1/8 inch letters for identifying individual equipment and loads.
   2. 1/4 inch letters for identifying grouped equipment and loads.

2.3 WIRE MARKERS <S>

A. Product Description: Cloth tape, split sleeve, or tubing type wire markers with circuit or control wire number permanently stamped or printed.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install rod electrodes at locations indicated and/or as required by the latest applicable edition of the National Electrical Code®.

B. Fabricate supports from structural steel or formed steel members.

C. Install sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

D. Install nameplate parallel to equipment lines. Secure nameplate to equipment front using stainless steel fasteners.

END OF SECTION

SECTION 26 05 03 - EQUIPMENT WIRING CONNECTIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes electrical connections to equipment.

B. Related Sections:
   1. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
   2. Section 26 05 33 - Raceway and Boxes for Electrical Systems.

1.2 REFERENCES

A. National Electrical Manufacturers Association:
   1. NEMA WD 1 - General Requirements for Wiring Devices.
   2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit wiring device manufacturer's catalog information showing dimensions, configurations, and construction.

C. Manufacturer's installation instructions.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Submittal procedures.

B. Project Record Documents: Record actual locations, sizes, and configurations of equipment connections.

1.5 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.

C. Determine connection locations and requirements.

D. Sequence rough-in of electrical connections to coordinate with installation of equipment.

E. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 PRODUCTS

2.1 CORD AND PLUGS

A. Manufacturers:
   1. Substitutions: Section 01 60 00 - Product Requirements

B. Attachment Plug Construction: Conform to NEMA WD 1.

C. Configuration: NEMA WD 6; match receptacle configuration at outlet furnished for equipment.

D. Cord Construction: Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.

E. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
B. Verify equipment is ready for electrical connection, for wiring, and to be energized.

3.2 INSTALLATION

A. Make electrical connections.

B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.

D. Provide receptacle outlet to accommodate connection with attachment plug.

E. Provide cord and cap for field-supplied attachment plug.

F. Provide suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.

G. Provide disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.

H. Provide terminal block jumpers to complete equipment wiring requirements.

I. Provide interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

J. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.

3.3 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Cooperate with utilization equipment installers and field service personnel during checkout and starting of equipment to allow testing and balancing and other startup operations. Provide personnel to operate electrical system and checkout wiring connection components and configurations.

END OF SECTION

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes building wire and cable; nonmetallic-sheathed cable; direct burial cable; service entrance cable; armored cable; metal clad cable; and wiring connectors and connections.

B. Related Sections:
1. Section 16300 - Identification for Electrical Systems: Product requirements for wire identification.
2. Section 31 23 17 - Trenching: Execution requirements for trenching required by this section.
3. Section 31 23 23 - Fill: Requirements for backfill to be placed by this section.

1.2 REFERENCES

A. International Electrical Testing Association:
1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

1.3 SYSTEM DESCRIPTION

A. Product Requirements: Provide products as follows:
1. Solid conductor for feeders and branch circuits 10 AWG and smaller.
2. Stranded conductors for control circuits.
3. Conductor not smaller than 12 AWG for power and lighting circuits.
4. Conductor not smaller than 16 AWG for control circuits.
5. 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.
6. 10AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet.

B. Wiring Methods: Provide the following wiring methods:
1. Concealed Dry Interior Locations: Use only Type THHN/THWN insulation, in raceway.
2. Exposed Dry Interior Locations: Use only Type THHN/THWN insulation in raceway.
3. Above Accessible Ceilings: Use only Type THHN/THWN insulation in raceway.
4. Wet or Damp Interior Locations: Use only Type THHN/THWN insulation in raceway.
5. Exterior Locations: Use only Type THHN/THWN insulation in raceway.
6. Underground Locations: Use only Type THHN/THWN insulation in raceway.

1.4 DESIGN REQUIREMENTS

A. Conductor sizes are based on copper.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit for building wire and all conductors on this project.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of components and circuits.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.8 FIELD MEASUREMENTS

A. Verify field measurements are as indicated on Drawings.

1.9 COORDINATION

A. Section 01 30 00 - Administrative Requirements : Requirements for coordination.

B. Where wire and cable destination is indicated and routing is not shown, determine routing and lengths required.

PART 2 PRODUCTS

2.1 BUILDING WIRE

A. Manufacturers:
1. Southwire
2. Anaconda
3. G.E.
4. Thomas & Betts
5. ITT
6. Blackburn
7. Penn-Union
8. Cerrowine
9. Remy Cable
10. Substitutions:Section 01 60 00 - Product Requirements.

B. Product Description: Single conductor insulated wire.

C. Conductor: Copper.

D. Insulation: 600 volt rating; thermoplastic material rated 90 degrees C.

2.1 WIRING CONNECTORS

2.2.1 All splices, taps, connections, terminations, etc., shall be made with appropriate connectors in a workmanlike manner and in compliance with the N.E.C.

2.2.2 All home runs shall be #12 or larger as indicated. No wire smaller than #12 shall be permitted serving lighting or outlets (see Section 26 50 00 for exception).

2.2.3 Splices for any combination of stranded and/or solid copper wire up to 3#8 or 2#6 shall be made with solderless electrical spring connectors. Splices for larger wire shall be solderless compression indention type properly taped.

Acceptable Manufacturers: 3M Scotchlok, Panduit P-Conn, or Ideal Wirenut.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify interior of building has been protected from weather.

C. Verify mechanical work likely to damage wire and cable has been completed.

D. Verify raceway installation is complete and supported.

3.2 PREPARATION

A. Contractor shall completely and thoroughly swab raceway before installing wire.

3.3 INSTALLATION

A. Route wire and cable to meet Project conditions.

B. Neatly train and lace wiring inside boxes, equipment, and panelboards.

C. Identify and color code wire and cable in strict accordance with the latest applicable edition of the N.E.C. under provisions of Section 26 05 53. Identify each conductor with its circuit number or other designation indicated.

D. Special Techniques--Building Wire in Raceway:
   1. Pull conductors into raceway at same time.
   2. Install building wire 4 AWG and larger with pulling equipment.

E. Special Techniques - Cable:
   1. Protect exposed cable from damage.
   2. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure or ceiling suspension system. Do not rest cable on ceiling panels.
   3. Use suitable cable fittings and connectors.

F. Special Techniques - Wiring Connections:
   1. Clean conductor surfaces before installing lugs and connectors.
   2. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
   3. Tape uninsulated conductors and connectors with electrical tape to 150 percent of insulation rating of conductor.
   4. Provide split bolt connectors for copper conductor splices and taps, 6 AWG and larger.
   5. Provide solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

6. Provide insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

G. Provide solid conductor for feeders and branch circuits 10 AWG and smaller.

H. Provide stranded conductors for branch circuits 10 AWG and smaller. However, when stranded conductors are used in lieu of solid, and then provide crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under screws.

I. All conductors shall be in conduit.

J. No more than three (3) current carrying conductors shall be installed in a single raceway.

3.4 WIRE COLOR

A. General
1. For wire sizes 10 AWG and smaller, install wire colors in accordance with the following:
a. Black and red for single phase circuits at 120/240 volts.
b. Black, red, and blue for circuits at 120/208 volts single or three phase.
c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.
2. For wire sizes 8 AWG and larger, identify wire with colored tape at terminals, splices and boxes. Colors are as follows:
a. Black and red for single phase circuits at 120/240 volts.
b. Black, red, and blue for circuits at 120/208 volts single or three phase.
c. Orange, brown, and yellow for circuits at 277/480 volts single or three phase.

B. Neutral Conductors: White. When two or more neutrals are located in one conduit, individually identify each with proper circuit number.

C. Branch Circuit Conductors: Provide three or four wire home runs with each phase uniquely color coded.

D. Feeder Circuit Conductors: Uniquely color code each phase.

E. Ground Conductors:
1. For 6 AWG and smaller: Green.
2. For 4 AWG and larger: Identify with green tape at both ends and visible points including junction boxes.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

END OF SECTION

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Rod electrodes.
   2. Active electrodes.
   3. Wire.
   4. Grounding well components.
   5. Mechanical connectors.
   6. Exothermic connections.

B. Related Sections:
   1. Section 03 20 00 - Concrete Reinforcing: Bonding or welding bars when reinforcing steel is used for electrodes.

1.2 REFERENCES

A. Institute of Electrical and Electronics Engineers:
   1. IEEE 142 - Recommended Practice for Grounding of Industrial and Commercial Power Systems.
   2. IEEE 1100 - Recommended Practice for Powering and Grounding Electronic Equipment.

B. National Fire Protection Association:
   1. NFPA 70 - National Electrical Code.
   2. NFPA 99 - Standard for Health Care Facilities.

1.3 SYSTEM DESCRIPTION

A. Grounding systems use the following elements as grounding electrodes:
   1. Metal underground water pipe.
   2. Metal building frame.
   3. Concrete-encased electrode.
   4. Rod electrode.

1.4 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 5 ohms maximum. In strict accordance with NFPA 99.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Product Data: Submit data on grounding electrodes and connections.

C. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

D. Manufacturer's Installation Instructions: Submit for active electrodes.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of components and grounding electrodes.

1.7 QUALITY ASSURANCE

A. Provide grounding materials conforming to requirements of NEC, IEEE 142, and UL labeled.

B. Perform Work in accordance with NFPA 99.

C. Maintain one copy of documents on site.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum 5 years documented experience and approved by manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

D. Do not deliver items to project before time of installation. Limit shipment of bulk and multiple-use materials to quantities needed for immediate installation.

1.10 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Complete grounding and bonding of building reinforcing steel prior concrete placement.

PART 2 PRODUCTS

2.1 ROD ELECTRODES

A. Manufacturers:
   1. Apache Grounding/Erico Inc.
   2. Copperweld, Inc.
   3. Erico, Inc.
   4. O-Z Gedney Co.
   5. Thomas & Betts, Electrical.

6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description:
1. Material: Copper-clad steel.
2. Diameter: 3/4 inch (19 mm).
3. Length: 10 feet (3.0 m).

C. Connector: Connector for exothermic welded connection.

2.2 ACTIVE ELECTRODES

A. Manufacturers:
1. Apache Grounding/Erico Inc.
2. Copperweld, Inc.
3. Erico, Inc.
4. O-Z Gedney Co.
5. Thomas & Betts, Electrical.
6. Substitutions: Section 01 60 00 - Product Requirements.

2.3 WIRE

A. Material: Stranded copper.

B. Foundation Electrodes: 4 AWG.

C. Grounding Electrode Conductor: Copper conductor bare.

D. Bonding Conductor: Copper conductor insulated.

2.4 MECHANICAL CONNECTORS

A. Manufacturers:
1. Apache Grounding/Erico Inc.
2. Copperweld, Inc.
3. Erico, Inc.
4. ILSCO Corporation.
5. O-Z Gedney Co.
6. Thomas & Betts, Electrical.
7. Substitutions: Section 01 60 00 - Product Requirements.

B. Description: Bronze connectors, suitable for grounding and bonding applications, in configurations required for particular installation.

2.5 EXOTHERMIC CONNECTIONS

A. Manufacturers:
1. Apache Grounding/Erico Inc.
2. Cadweld, Erico, Inc.
3. Copperweld, Inc.
4. ILSCO Corporation.
5. O-Z Gedney Co.
6. Thomas & Betts, Electrical.
7. Substitutions: [Section 01 60 00 - Product Requirements.

B. Product Description: Exothermic materials, accessories, and tools for preparing and making permanent field connections between grounding system components.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of conditions before starting work.

B. Verify final backfill and compaction has been completed before driving rod electrodes.

3.2 PREPARATION

A. Remove paint, rust,[mill oils, and all surface contaminants at connection points.

3.3 INSTALLATION

A. Provide in accordance with IEEE 142 and 1100.

B. Provide rod electrodes to achieve specified resistance to ground.]

C. Provide grounding and bonding conductors concealed from view.

D. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing. Electrically bond steel together.

E. Bond together metal siding not attached to grounded structure; bond to ground.

F. Provide isolated grounding conductor for circuits supplying electronic cash registers, personal computers and sensitive electronic equipment in accordance with IEEE 1100.

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements, 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Perform ground resistance testing in accordance with IEEE 142.

C. Perform, record and submit in writing, leakage current tests in accordance with NFPA 99.

D. Perform continuity testing in accordance with IEEE 142.

E. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.

END OF SECTION

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Conduit supports.
2. Formed steel channel.
3. Spring steel clips.
4. Sleeves.
5. Mechanical sleeve seals.
6. Firestopping relating to electrical work.
7. Firestopping accessories.
8. Equipment bases and supports.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Product requirements for concrete for placement by this section.
2. Section 27 05 29 - Hangers and Supports for Communications Systems.

1.2 REFERENCES

A. ASTM International:
1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
4. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems.

B. FM Global:
1. FM - Approval Guide, A Guide to Equipment, Materials & Services Approved By Factory Mutual Research For Property Conservation.

C. National Fire Protection Association:
1. NFPA 70 - National Electrical Code.

D. Underwriters Laboratories Inc.:
1. UL 263 - Fire Tests of Building Construction and Materials.
2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
3. UL 1479 - Fire Tests of Through-Penetration Firestops.
4. UL 2079 - Tests for Fire Resistance of Building Joint Systems.
5. UL - Fire Resistance Directory, Volume I and II.

1.3 DEFINITIONS

A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 SYSTEM DESCRIPTION

A. All conduit and other penetrations through fire rated ceilings, walls or floors shall be fire stopped using U.L. approved materials and methods to maintain the fire rating of the ceiling, wall or floor structure. All penetrations shall comply with the latest applicable edition of the UL fire resistance directory Vol. I and Vol. II.

B. Firestopping Materials: ASTM E119, ASTM E814, UL 263 and UL 1479 to achieve fire ratings as noted on Drawings for adjacent construction, but not less than 1 hour fire rating.

C. Firestop interruptions to fire rated assemblies, materials, and components.

1.5 PERFORMANCE REQUIREMENTS

A. Firestopping: Conform to FM and UL for fire resistance ratings and surface burning characteristics.

B. Firestopping: Provide certificate of compliance from authority having jurisdiction indicating approval of materials used.

1.6 SUBMITTALS <S>

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate system layout with location and detail of trapeze hangers.

C. Product Data:
   1. Hangers and Supports: Submit manufacturers catalog data.
   2. Firestopping: Submit data on product characteristics, performance and limitation criteria.

D. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.

E. Design Data: Indicate load carrying capacity of trapeze hangers and supports.

F. Manufacturer's Installation Instructions:
   1. Hangers and Supports: Submit special procedures and assembly of components.
   2. Firestopping: Submit preparation and installation instructions.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

H. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

1.7 QUALITY ASSURANCE

A. Through Penetration Firestopping of Fire Rated Assemblies shall comply with the latest applicable edition of the U.L. Fire Resistance Directory, Volumes I and II.

B. Maintain copy of U.L. Fire Resistance Directory Volume I and II on site.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum three years documented experience and approved by the materials manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept materials on site in original factory packaging, labeled with manufacturer's identification.

C. Protect from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original packaging.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Do not apply firestopping materials when temperature of substrate material and ambient air is below 60 degrees F (15 degrees C).

C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of firestopping materials.

PART 2 PRODUCTS

2.1 CONDUIT SUPPORTS

A. Raceways shall be installed neatly racked, routed parallel or perpendicular to building lines, securely attached and supported complete with associated couplings, connectors and fittings. Installation shall conform with applicable sections of N.E.C. Article 342 through 362.

B. Concealed raceway shall be supported with galvanized stamped steel "2-Hole" clamps secured to structure. Conduit or ductwork shall not be used to support other conduit. Exposed raceways shall be secured to structure with galvanized stamped steel "2-Hole" clamps or suspended from structure with beam clamps and conduit hangers. All conduits shall be directly supported by the building structure with the use of the appropriate factory fabricated support system as specified above. Use of caddy clips to support conduit to top of T-bar ceiling grid or ceiling support system will not be permitted.

Grouped raceways shall be supported with galvanized steel channel assemblies.

	Kindorf	Globe Strut	Unistrut
strut	B-909	G-5812-PO	P1000-HS
one-hole strap	C-105	G-7000	P1100

Acceptable manufacturers: Unistrut, Power Strut, Globe Strut, or Kindorf.

Raceway supports shall be spaced as follows:

a. rigid metal, IMC or EMT - within 3' of termination, coupling or connection and 10' o.c.
b. rigid nonmetallic - per N.E.C. paragraph 347-8.
c. flexible nonmetallic - within 12" of termination or connection, 4.5' o.c.

C. Raceways shall be concealed where possible in finished areas, and may be exposed in mechanical/electrical equipment rooms.

D. Hanger Rods: Threaded high tensile strength galvanized carbon steel with free running threads.

E. Beam Clamps: Malleable Iron, with tapered hole in base and back to accept either bolt or hanger rod. Set screw: hardened steel.

F. Conduit clamps for trapeze hangers: Galvanized steel, notched to fit trapeze with single bolt to tighten.

G. Conduit clamps - general purpose: Two hole malleable iron for surface mounted conduits.

H. Cable Ties: High strength nylon temperature rated to 185 degrees F (85 degrees C). Self locking.

2.2 SLEEVES

A. Furnish materials in accordance with the latest edition of the NEC.

B. Sleeves for Conduit through Non-fire Rated Floors: 18 gage (1.2 mm) thick galvanized steel.

C. Sleeves for Conduit through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Steel pipe or 18 gage (1.2mm) thick galvanized steel.

D. Sleeves for Conduit through Fire Rated and Fire Resistive Floors and Walls, and Fire Proofing: Prefabricated fire rated sleeves including seals, UL listed.

E. Fire-stopping Insulation: Per the latest edition of the UL Fire Resistance Directory Volumes I and II.

2.3 MECHANICAL SLEEVE SEALS

A. Manufacturers:
1. Thunderline Link-Seal, Inc.
2. NMP Corporation.

B. Product Description: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between object and sleeve, connected with bolts and pressure plates causing rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2.4 FIRESTOPPING

A. Manufacturers:

1. Dow Corning Corp.
2. Fire Trak Corp.
3. Hilti Corp.
4. International Protective Coating Corp.
5. 3M fire Protection Products.
6. Specified Technology, Inc.

B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.

2.5 FIRESTOPPING ACCESSORIES

A. Firestopping accessories shall comply with the latest applicable edition of the U.L. Fire Resistance Directory, Volumes I and II.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Verification of conditions before starting work.

B. Verify openings are ready to receive sleeves.

C. Verify openings are ready to receive firestopping.

3.2 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.

B. Remove incompatible materials affecting bond.

C. Provide materials to arrest liquid material leakage.

D. Obtain permission from Architect/Engineer before using powder-actuated anchors.

E. Do not drill or cut structural members.

3.3 INSTALLATION - HANGERS AND SUPPORTS

A. Anchors and Fasteners:
1. Concrete Structural Elements: Provide precast inserts, expansion anchors, and preset inserts as required and as approved by the project structural engineer.
2. Steel Structural Elements: Provide beam clamps, spring steel clips, steel ramset fasteners, and welded fasteners as required and as approved by the project structural engineer.
3. Concrete Surfaces: Provide self-drilling anchors and expansion anchors as required and as approved by the project structural engineer.
4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Provide toggle bolts and hollow wall fasteners as required and as approved by the project structural engineer.
5. Solid Masonry Walls: Provide expansion anchors and preset inserts as required and as approved by the project structural engineer..

6. Sheet Metal: Provide sheet metal screws as required and as approved by the project structural engineer.
7. Wood Elements: Provide wood screws as required and as approved by the project structural engineer.

B. Inserts:
1. Install inserts for placement in concrete forms.
2. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches (100 mm).
4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above, recessed into and grouted flush with slab.

C. Install conduit and raceway support and spacing in accordance with the latest applicable edition of the NEC.

D. Do not fasten supports to pipes, ducts, mechanical equipment, conduit or ceiling suspension wires.

E. Install multiple conduit runs on common hangers.

F. Supports:
1. Fabricate supports from structural steel or formed steel channel. Install hexagon head bolts to present neat appearance with adequate strength and rigidity. Install spring lock washers under nuts.
2. Install surface mounted cabinets and panelboards with minimum of four anchors.
3. In wet and damp locations install stainless steel channel supports to stand cabinets and panelboards 1 inch (25 mm) off wall.
4. Support vertical conduit at every floor.

3.4 INSTALLATION - FIRESTOPPING

A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping to comply with the latest applicable edition of the U.L. Fire Resistance Directory, Volumes I and II.

3.5 INSTALLATION - EQUIPMENT BASES AND SUPPORTS

A. Provide housekeeping pads reinforced of concrete, minimum 3-1/2 inches (87 mm) thick and extending 6 inches (150 mm) beyond supported equipment Refer to Section 03 30 00.

B. Using templates furnished with equipment, install anchor bolts, and accessories for mounting and anchoring equipment.

C. Construct supports of steel members and/or formed steel channel. Brace and fasten with flanges bolted to structure.

3.6 INSTALLATION - SLEEVES

A. Exterior watertight entries: Seal with adjustable interlocking rubber links.

B. Conduit penetrations not required to be watertight: Sleeve and fill with silicon foam.

C. Set sleeves in position in forms. Provide reinforcing around sleeves.

D. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

E. Extend sleeves through floors 1 inch (25mm) above finished floor level. Caulk sleeves.

F. Where conduit or raceway penetrates floor, ceiling, or wall, close off space between conduit or raceway and adjacent work with fire stopping insulation and caulk airtight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

G. Install stainless steel escutcheons at finished surfaces.

3.7 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements, 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.8 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for cleaning.

B. Clean adjacent surfaces of firestopping materials.

3.9 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for protecting finished Work.

B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 26 05 33: RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

B. Related Sections:
1. Section 26 05 03 - Equipment Wiring Connections.
2. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
3. Section 26 05 29 - Hangers and Supports for Electrical Systems.
4. Section 26 05 39 - Underfloor Raceways for Electrical Systems.
5. Section 26 05 53 - Identification for Electrical Systems.
6. Section 26 27 16 - Electrical Cabinets and Enclosures.
7. Section 26 27 26 - Wiring Devices.
8. Section 27 05 33 - Conduits and Backboxes for Communications Systems.

1.2 REFERENCES

A. American National Standards Institute:
1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
3. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).

B. National Electrical Manufacturers Association:
1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
5. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
6. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.3 SYSTEM DESCRIPTION

A. Provide raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway, J-boxes and pullboxes required to complete wiring system.

B. Underground More than 5 feet (1500mm) outside Foundation Wall: Provide rigid steel conduit. Provide cast metal boxes or nonmetallic handhole.

C. Underground Within 5 feet (1500mm) from Foundation Wall: Provide rigid steel conduit. Provide cast metal or nonmetallic boxes.

D. In or Under Slab on Grade: Provide rigid steel conduit. Provide cast or nonmetallic metal boxes.

E. Outdoor Locations, Above Grade: Provide rigid steel conduit. Provide cast metal pull, and junction boxes.

F. In Slab Above Grade: Provide rigid steel conduit. Provide cast metal boxes.

G. Wet and Damp Locations: Provide plastic coated rigid. Provide cast metal or nonmetallic outlet, junction, and pull boxes. Provide flush mounting outlet box in finished areas.

H. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

I. Exposed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.4 DESIGN REQUIREMENTS

A. Minimum Raceway Size: 3/4 inch (19mm) unless otherwise specified.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit for the following:
1. Flexible metal conduit.
2. Liquidtight flexible metal conduit.
3. Nonmetallic conduit.
4. Flexible nonmetallic conduit.
5. Nonmetallic tubing.
6. Raceway fittings.
7. Conduit bodies.
8. Surface raceway.
9. Wireway.
10. Pull and junction boxes.
11. Handholes.

C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents:

1. Record actual routing of conduits larger than 3/4 inch.
2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

C. Protect PVC conduit from sunlight.

1.8 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate installation of outlet boxes for equipment connected under Section 26 05 03.

C. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

PART 2 PRODUCTS

2.1 METAL CONDUIT

A. Manufacturers:
1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Rigid Steel Conduit: ANSI C80.1.

C. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.2 PVC COATED METAL CONDUIT

A. Manufacturers:
1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: NEMA RN 1; rigid steel conduit with external PVC coating 40 mil (0.1mm) thick.

C. Fittings and Conduit Bodies: NEMA FB 1; steel fittings with external PVC coating to match conduit.

2.3 FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. Carlon Electrical Products.

2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Interlocked steel construction.

C. Fittings: NEMA FB 1.

2.4 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

A. Manufacturers:
1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Interlocked steel construction with PVC jacket.

C. Fittings: NEMA FB 1.

2.5 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: ANSI C80.3; galvanized tubing.

C. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron, compression type (no set screw allowed).

2.6 NONMETALLIC CONDUIT

A. Manufacturers:
1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: NEMA TC 2; Schedule 40 PVC.

C. Fittings and Conduit Bodies: NEMA TC 3.

2.7 SURFACE METAL RACEWAY

A. Manufacturers:
1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Sheet metal channel with fitted cover, suitable for use as surface metal raceway.

C. Finish: As directed by Architect.

D. Fittings, Boxes, and Extension Rings: Furnish manufacturer's standard accessories; match finish on raceway.

2.8 WIREWAY

A. Manufacturers:
1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: Oiltight, dust-tight and raintight type wireway.

C. Knockouts: Manufacturer's standard.

D. Size and length as indicated on Drawings.

E. Cover: Hinged and Screw cover with full gaskets.

F. Connector: Flanged.

G. Fittings: Lay-in type with removable top, bottom, and side; captive screws drip shield.

H. Finish: Rust inhibiting primer coating with gray enamel finish.

2.9 OUTLET BOXES <S>

A. Manufacturers:
1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Provide metallic galvanized boxes per the latest applicable edition of N.E.C. Article 314 at each outlet location indicated on the drawings or as required.

C. Boxes at exterior locations shall be cast aluminum with threaded hubs and gasketed covers.

D. The owner reserves the right to make minor adjustments to the locations of outlet boxes prior to rough-in.

E. Sizes and configuration of boxes shall be as required for the intended service and shall conform to and be applied in accordance with Table 314-16(a) of the N.E.C. Provide extension rings, expandable bars sets, supports, gaskets for weatherproof type etc., where required.

Boxes shall be equal to Steel City with "CV" bracket.
Acceptable Manufacturers: Steel City, Hubbell, or Appleton.

F. Floor mounted boxes shall be adjustable and gasketed. See Wiring Devices for additional information.

G. Gang type boxes shall be used where multiple wiring devices are located adjacent to one another, including cast in floor boxes.

H. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; Provide 1/2 inch (13 mm) male fixture studs where required.
2. Concrete Ceiling Boxes: Concrete type.

I. Nonmetallic Outlet Boxes: NEMA OS 2.

J. Cast Boxes: NEMA FB 1, Type FD. Furnish gasketed cover by box manufacturer and provide threaded hubs.

K. Wall Plates for Finished Areas: As specified in Section 26 27 26.

L. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.10 PULL AND JUNCTION BOXES

A. Manufacturers:
1. Carlon Electrical Products.
2. Hubbell Wiring Devices.
3. Thomas & Betts Corp.
4. Walker Systems Inc.
5. The Wiremold Co.
6. Substitutions: Section 01 60 00 - Product Requirements.

B. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

C. Hinged Enclosures: As specified in Section 26 27 16.

D. Surface Mounted Cast Metal Box: NEMA 250, Type [4X; flat-flanged, surface mounted junction box:
1. Material: Cast aluminum.
2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

E. In-Ground Cast Metal Box: NEMA 250, Type 6, flanged, recessed cover box for flush mounting:
   1. Material: Cast aluminum.
   2. Cover: [Smooth] [Nonskid] cover with neoprene gasket and stainless steel cover screws.
   3. Cover Legend: "ELECTRIC".

F. Fiberglass Handholes: Die-molded, glass-fiber hand holes:
   1. Cable Entrance: Pre-cut 6 inch x 6 inch (150 mm x 150 mm) cable entrance at center bottom of each side.
   2. Cover: Glass-fiber , weatherproof cover with nonskid finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 INSTALLATION

A. Install Work in accordance with the latest applicable edition of the NEC.

B. Ground and bond raceway and boxes in accordance with Section 26 05 26.

C. Fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.

D. Identify raceway and boxes in accordance with Section 26 05 53.

E. Arrange raceway and boxes to maintain headroom and present neat and workman like appearance.

3.3 INSTALLATION - RACEWAY

A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

B. Arrange raceway supports to prevent misalignment during wiring installation.

C. Support raceway using coated steel or malleable iron straps, clevis hangers, and split hangers.

D. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 26 05 29; provide space on each for 25 percent additional raceways.

E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports

F. Do not attach raceway to ceiling support wires or other piping systems.

G. Construct wireway supports from steel channel specified in Section 26 05 29.

H. Route exposed raceway parallel and perpendicular to walls and building lines.

I. Route raceway installed above accessible ceilings parallel and perpendicular to walls.

J. Route conduit in and under slab from point-to-point.

K. Maximum Size Conduit in Slab Above Grade: 3/4 inch (19mm). Do not cross conduits in slab. Verify with project Structural Engineer prior to placing.

L. Maintain clearance between raceway and piping for maintenance purposes.

M. Maintain 12 inch (300 mm) clearance between raceway and surfaces with temperatures exceeding 104 degrees F (40 degrees C).

N. Cut conduit square using saw or pipe cutter; de-burr cut ends.

O. Bring conduit to shoulder of fittings; fasten securely.

P. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.

Q. Provide conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

R. Provide no more than equivalent of three 90 degree bends between boxes. Provide conduit bodies to make sharp changes in direction, as around beams. Provide factory elbows for bends in metal conduit larger than 2 inch (50 mm) size.

S. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

T. Provide fittings to accommodate expansion and deflection where raceway crosses seismic, control and expansion joints.

U. Provide suitable pull string or cord in each empty raceway except sleeves and nipples.

V. Provide suitable caps to protect installed conduit against entrance of dirt and moisture.

W. Surface Raceway: Provide flat-head screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Provide insulating bushings and inserts at connections to outlets and corner fittings.

X. Close ends and unused openings in wireway.

Y. Do not group more homeruns in a single raceway than shown on the drawings. Do not group more than three (3) homeruns in a single raceway without the written permission of the Architect. Provide a separate neutral for each phase leg in the raceway unless shown otherwise on the drawings.

3.4 INSTALLATION - BOXES

A. Provide wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings or as specified in section for outlet device.

B. The owner reserves the right to adjust box location up to 20 feet (6m) prior to rough-in to accommodate intended purpose.

C. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.

D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

E. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150 mm) from ceiling access panel or from removable recessed luminaire.

F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

G. Do not install flush mounting box back-to-back in walls; install with minimum 24 inches (600 mm) separation in walls.

H. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

I. Install stamped steel bridges to fasten flush mounting outlet box between studs.

J. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

K. Install adjustable steel channel fasteners for hung ceiling outlet box.

L. Do not fasten boxes to ceiling support wires or other piping systems.

M. Support boxes independently of conduit.

N. Install gang box where more than one device is mounted together. Do not use sectional box.

O. Install gang box with plaster ring for single device outlets.

P. Mark all boxes with circuit numbers of circuits contained in box.

3.5 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods in accordance with Section 07 84 00.

B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation.

C. Locate outlet boxes to allow luminaries positioned as indicated on Drawings and Architect's reflected ceiling plan.

D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.6 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Adjust flush-mounting outlets to make front flush with finished wall material.

C. Install knockout closures in unused openings in boxes.

3.7 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Clean interior of boxes to remove dust, debris, and other material.

C. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Nameplates.
   2. Labels.
   3. Wire markers.
   4. Conduit markers.
   5. Stencils.
   6. Underground Warning Tape.
   7. Lockout Devices.

B. Related Sections:
   1. Section 09 90 00 - Painting and Coating: Execution requirements for painting specified by this section.
   2. Section 27 05 53 - Identification for Communications Systems.
   3. Section 28 05 53 - Identification for Electronic Safety and Security.

1.2 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data:
   1. Submit manufacturer's catalog literature for each product required.
   2. Submit electrical identification schedule including list of wording, symbols, letter size, color coding, tag number, location, and function.
   3. Submit two (2) samples of each type of identification products applicable to project.
   4. Submit two (2) nameplates, 4 x 4 inch in size illustrating materials and engraving quality.

C. Manufacturer's Installation Instructions: Indicate installation instructions, special procedures, and installation.

1.3 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of tagged devices; include tag numbers.

1.4 QUALITY ASSURANCE

A. Perform Work in a workman like and neat manner.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three (3) years experience.

B. Installer: Company specializing in performing Work of this section with minimum three (3) years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

B. Accept identification products on site in original containers. Inspect for damage.

C. Accept materials on site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

D. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Install nameplates only when ambient temperature and humidity conditions are within range recommended by manufacturer.

1.8 EXTRA MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements.

PART 2 PRODUCTS

A. Product Description: Laminated three-layer plastic with engraved letters on contrasting background color. White letters on red background for all items connected to an essential electrical system.

B. Letter Size:
1. 1/8 inch (3mm) high letters for identifying individual equipment and loads.
2. 1/4 inch (6mm) high letters for identifying grouped equipment and loads and panelboards.

C. Minimum nameplate thickness: 1/8 inch.

2.2 LABELS

A. Labels: Embossed adhesive tape, with 3/16 inch white letters on black background. White letters on red background for essential electrical systems.

2.3 WIRE MARKERS

A. Description: Cloth tape, split sleeve, or tubing type wire markers.

B. Legend:
1. Power and Lighting Circuits: Branch circuit or feeder number.
2. Control Circuits: Control wire number as indicated on shop drawings.

2.4 CONDUIT AND RACEWAY MARKERS

A. Description: Nameplate fastened with straps.

B. Color:
1. Provide white letters on red background for essential electrical systems.
2. 480 Volt System: Black lettering on white background.
3. 208 Volt System: Black lettering on white background.

C. Legend:
1. 480 Volt System: 480 VOLTS. HIGH VOLTAGE.
2. 208 Volt System: 208 VOLTS.

2.5 STENCILS

A. Stencils: With clean cut symbols and letters of following size:
1. Up to 2 inches Outside Diameter of Raceway: 1/2 inch high letters.
2. 2-1/2 to 6 inches Outside Diameter of Raceway: 1 inch high letters.

B. Stencil Paint: As specified in Section 09 90 00, semi-gloss enamel, colors conforming to the following:
1. Black lettering on white background.
2. White lettering on gray background.
3. Red lettering on white background.
4. Blue lettering on white background.

2.6 UNDERGROUND WARNING TAPE

A. Description: 4 inch wide plastic tape, detectable type, colored red and yellow with suitable warning legend describing buried electrical lines.

2.7 LOCKOUT DEVICES

A. Lockout Hasps:
1. Reinforced nylon hasp with erasable label surface; size minimum 7-1/4 x 3 inches.

PART 3 EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials.

B. Prepare surfaces in accordance with Section 09 90 00 for stencil painting.

3.2 INSTALLATION

A. Install identifying devices after completion of painting.

B. Nameplate Installation:
1. Install nameplate parallel to equipment lines.
2. Install nameplate for each electrical distribution and control equipment enclosure with corrosive-resistant mechanical fasteners, or adhesive.

3. Install nameplates for each control panel and major control components located outside panel with corrosive-resistant mechanical fasteners, or adhesive.
4. Secure nameplate to equipment front using stainless steel fasteners.
5. Secure nameplate to inside surface of door on recessed panelboard in finished locations.
6. Install nameplates for the following:
    a. Switchboards.
    b. Panelboards.
    c. Transformers.
    d. Service Disconnects.
    e. Motor Toggle Switches

C. Label Installation:
1. Install label parallel to equipment lines.
2. Install label for identification of individual control device stations.
3. Install labels for permanent adhesion and seal with clear lacquer.

D. Wire Marker Installation:
1. Install wire marker for each conductor at panelboards, pull boxes, outlet and junction boxes, and each load connection.
2. Mark data cabling at each end. Install additional marking at accessible locations along the cable run.
3. Install labels at data outlets identifying patch panel and port designation [as indicated on Drawings].

E. Raceway Marker Installation:
1. Install raceway marker for each raceway longer than 6 feet.
2. Raceway Marker Spacing: 20 feet on center.
3. Raceway Painting: Identify conduit using field painting in accordance with Section 09 90 00.
    a. Paint colored band on each conduit longer than 6 feet.
    b. Paint bands 20 feet (6000mm) on center.
    c. Color:
        1) 480 Volt System: Blue.
        2) 208 Volt System: Yellow.

F. Stencil Installation:
1. Apply stencil painting in accordance with Section 09 90 00.

G. Underground Warning Tape Installation:
1. Install underground warning tape along length of each underground conduit, raceway, or cable 6 to 8 inches (150 to 200 mm) below finished grade, directly above buried conduit, raceway, or cable.

H. Install Work in accordance with the latest applicable edition of the NEC.

END OF SECTION

SECTION 26 09 23 - LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Remote control lighting relays.
2. Lighting contactors.
3. Switches.
4. Switch plates.
5. Occupancy sensors.
6. Photocells.
7. Photocell control unit.

B. Related Sections:
1. Section 26 05 03 - Equipment Wiring Connections: Execution requirements for electric connections specified by this section.
2. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
3. Section 26 05 33 - Raceway and Boxes for Electrical Systems: Product requirements for raceway and boxes for placement by this section.
4. Section 26 05 53 - Identification for Electrical Systems: Product requirements for electrical identification items for placement by this section.
5. Section 26 24 16 - Panelboards.
6. Section 26 27 26 - Wiring Devices: Product requirements for wiring devices for placement by this section.

1.2 REFERENCES

A. National Electrical Manufacturers Association:
1. NEMA AB 1 - Molded Case Circuit Breakers and Molded Case Switches.
2. NEMA FU 1 - Low Voltage Cartridge Fuses.
3. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contractors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.
4. NEMA ICS 4 - Industrial Control and Systems: Terminal Blocks.
5. NEMA ICS 5 - Industrial Control and Systems: Control Circuit and Pilot Devices.
6. NEMA ICS 6 - Industrial Control and Systems: Enclosures.
7. NEMA KS 1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).

1.3 SYSTEM DESCRIPTION

A. Distributed switching control using self contained individually mounted lighting relays.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings: Indicate dimensioned drawings of lighting control system components and accessories.
1. One Line Diagram: Indicating system configuration indicating panels, number and type of switches or devices.
2. Include typical wiring diagrams for each component.

C. Product Data: Submit manufacturer's standard product data for each system component.

D. Manufacturer's Installation Instructions: Submit for each system component.

E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record the following information:
   1. Actual locations of components and record circuiting and switching arrangements.
   2. Wiring diagrams reflecting field installed conditions with identified and numbered, system components and devices.

C. Operation and Maintenance Data:
   1. Submit replacement parts numbers.
   2. Submit manufacturer's published installation instructions and operating instructions.
   3. Recommended renewal parts list.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with all applicable codes.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.8 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements : Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements : Requirements for transporting, handling, storing, and protecting products.

B. Accept components on site in manufacturer's packaging. Inspect for damage.

C. Protect components by storing in manufacturer's containers indoor protected from weather.

1.10 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements : Requirements for warranties.

B. Furnish five year manufacturer warranty for components.

1.11 EXTRA MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for extra materials.

B. Furnish two of each switch type.

C. Furnish two of each occupancy sensor type.

D. Furnish two of each photocell type.

PART 2 PRODUCTS

2.1 SWITCHES

A. Manufacturers:
   1. Hubbell Incorporated
   2. Leviton Manufacturing Co., Inc.
   3. Pass and Seymour/Legrand
   4. Substitutions: Section 01 60 00 - Product Requirements

B. Wall Switch: Industrial Grade non-pilot light toggle switches for overriding relays.
   1. Color: Ivory

2.2 SWITCH PLATES

A. Manufacturers:
   1. Hubbell Incorporated
   2. Leviton Manufacturing Co., Inc.
   3. Pass and Seymour/Legrand
   4. Substitutions: Section 01 60 00 - Product

B. Product Description: Specification Grade.
   1. Material: Brushed Formula 302 Stainless Steel

PART 3 EXECUTION

3.1 INSTALLATION

A. Mount switches, occupancy sensors, and photocells as indicated on Drawings.

B. Install wiring in accordance with Section 26 05 19

C. Use only properly color coded, stranded wire. Install wire sizes as indicated on Drawings. Install wire in conduit in accordance with Section 26 05 33

D. Label each low voltage wire clearly indicating connecting relay panel. Refer to Section 26 05 53

E. Wire numbered relays in panel to control power to each load. Install relays to be accessible. Allow space around relays for ventilation and circulation of air.

F. Identify power wiring with circuit breaker number controlling load. When multiple circuit breaker panels are feeding into relay panel, label wires to indicate originating panel designation.

G. Label each low voltage wire with relay number at each switch or sensor.

3.2 MANUFACTURER'S FIELD SERVICES

A. Section 01 40 00 - Quality Requirements: Requirements for manufacturer's field services.

B. Furnish services for minimum of one day for check, test, and start-up. Perform the following services:
   1. Check installation of panelboards.
   2. Test operation of remote controlled devices.
   3. Repair or replace defective components.

3.3 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for starting and adjusting.

B. Test each system component after installation to verify proper operation.

C. Test [relays,] [contactors,] and switches after installation to confirm proper operation.

D. Confirm correct loads are recorded on directory card in each panel.

3.4 DEMONSTRATION

A. Section 01 70 00 - Execution and Closeout Requirements : Requirements for demonstration and training.

B. Demonstrate operation of the following system components:
   1. Operation of each type of occupancy sensors. Demonstrate for all zones.
   2. Operation of each type of photocell. Demonstrate for all zones.

C. Furnish 4 hours to instruct Owner's personnel in operation and maintenance of system. Schedule training with Owner, provide at least 7 days notice to Architect/Engineer of training date.

END OF SECTION

SECTION 26 20 00 - LOW-VOLTAGE ELECTRICAL TRANSMISSION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes enclosed switches and circuit breakers; enclosed controllers and contactors; panelboards; and fuses.

1.2 SUBMITTALS

A. Product Data: Submit catalog data showing products with specified features.

1.3 EXTRA MATERIALS

A. Upon completion of the building, the Electrical Subcontractor shall provide the owner with spare fuses as shown below.
   1. 10% of each type of rating installed 110 to 600 amperes.
   2. One standard carton of each type and rating installed 0 to 100 amperes.
   3. Three fuses each rating installed 601 to 6000 amperes.

PART 2 PRODUCTS <S><OM>

2.1 ENCLOSED FUSIBLE SWITCH

A. Manufacturers:
   1. Cutler-Hammer, Model DH.
   2. Square D, Model AD.
   3. General Electric, Model TH.
   4. Siemens, Model HF.

B. Provide safety switches at each location indicated on the drawings or required by code. Switches shall be rigidly supported and properly aligned.

C. Switching mechanism shall be quick-make, quick-break mechanism with handle as integral part of the box. All current carrying parts shall be electroplated.

D. Product Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in ON position, enclosed load interrupter knife switch. Handle lockable in OFF position. Enclosures shall be NEMA 1 for interior locations and NEMA 3R for exterior locations, and shall be of code gauge steel (galvanized for NEMA 3R) with baked enamel finish and shall have locking hasp.

E. Ratings, fusing provisions, poles, etc., shall be as indicated.

F. Fuse clips: Designed to accommodate NEMA FU 1, Class R or J fuses.

2.2 ENCLOSED NONFUSIBLE SWITCH

A. Manufacturers:
   1. Cutler-Hammer, Model DH.
   2. Square D, Model AD.
   3. General Electric, Model TH.
   4. Siemens, Model HNF.

B. Provide safety switches at each location indicated on the drawings or required by code. Switches shall be rigidly supported and properly aligned.

C. Switching mechanism shall be quick-make, quick-break mechanism with handle as integral part of the box. All current carrying parts shall be electroplated.

D. Product Description: NEMA KS 1, Type HD with externally operable handle interlocked to prevent opening front cover with switch in ON position, enclosed load interrupter knife switch. Handle lockable in OFF position. Enclosures shall be NEMA 1 for interior locations and NEMA 3R for exterior locations, and shall be of code gauge steel (galvanized for NEMA 3R) with baked enamel finish and shall have locking hasp.

E. Ratings, fusing provisions, poles, etc., shall be as indicated.

F. Fuse clips: Designed to accommodate NEMA FU 1, Class R or J fuses.

2.3 MOLDED CASE CIRCUIT BREAKER

A. Manufacturers:
1. Cutler-Hammer.
2. Square D.
3. General Electric.
4. Siemens.

B. Product Description: Enclosed, molded-case circuit breaker conforming to NEMA AB 1.

C. Enclosure: NEMA AB 1, Type to meet conditions.

2.4 DRY TYPE DISTRIBUTION TRANSFORMERS: <S>

A. Transformers to be dry-type with natural draft ventilation. Units to be rated for 480 volts, 3 phase, 3 wire primary, and 120/208 volts, 3 phase, 4 wire secondary, unless otherwise indicated. Units to be designed for 60 Hertz operation, with KVA capacities as shown on drawings. Transformers to conform with applicable NEMA and ANSI standards, and be UL listed.

B. Transformers to have Class H insulation, high grade silicone steel cores, and be rated for a maximum temperature rise of 115 degrees C. Units rated 30 KVA and larger shall have four 2-1/2% taps below normal and two 2 1/2% taps above normal. Units rated less than 30 KVA to have two 5% taps below normal.

C. Sound levels generated by transformers are not to exceed the following values: 9 KVA and less -40 db, 10 to 45 KVA -42 dB, 50 to 150 KVA -45 db.

D. Acceptable manufacturers: General Electric, Square D, or Cutler Hammer.

2.5 MAIN POWER SWITCHBOARD: <S> <OM>

A. Switchboard shall be dead front type, with all cable and bus connections accessible from switchboard front. Sections shall be fabricated with dieformed 12 ga. steel, with rolled edges and channel iron rails. Units shall be factory assembled and tested, and shall comply with the latest ANSI, IEEE, and NEMA standards. Configurations and arrangement shall be as indicated on drawings.

B. Provide a freestanding switchboard consisting of main and distribution sections, rated for 480Y/277 volts, 3 phase, 4 wire. The sections shall be totally enclosed 36" deep x 90" high cubicles, containing fusible switches or circuit breakers as indicated on the plans, incoming service cable lugs, meters, current transformers, and other devices required to perform the intended functions.

1. Bussing shall be aluminum, braced for 100,000 AIC integrated equipment rating, with current ratings as indicated, suitable for continuous operation with a maximum rise of 50 degrees C above 25 degrees C ambient.
2. Instrumentation shall include the following:
   a. Square D Power Logic CM-2150, Cutler-Hammer IQ DP-4000, General Electric Power Leader EPM.
   b. C. T.'s, P. T.'s, sensors and other devices necessary for the intended operation of the instrumentation.

C. Labels shall include engraved laminated bakelite plates at each main and distribution switch which indicates services. See Identification and Nameplates for additional requirements.

D. Acceptable Manufacturers: Square D "Power Style" QED, Cutler-Hammer PRLC, or General Electric Class 1 and 2 Spectra Switchboards or equal by Siemens.

2.6 GROUND FAULT PROTECTION SYSTEM: <S> <OM>

A. Provide completely wired, UL listed, zone selective, ground fault protection system consisting of sense coils, ground fault relays and monitor test system. The system shall be capable of 2 level operation.

B. Equipment is based on Square D type GC system. Equal equipment by General Electric or Westinghouse is acceptable.

C. Sense Coil shall be laminated iron case with dual winding. Provide test winding for simulation of ground fault condition.

D. Ground Fault Relay shall continuously monitor the output of the sensor and shall initiate the opening of the circuit underground fault conditions. Current pickup shall be field adjustable from 100 to 1200 amperes. Time delay shall be field adjustable for 0.1, 0.2, 0.3 or 0.5 seconds.

E. Monitor-test System feature shall simulate a ground fault and shall reset each relay. Ground fault simulation and reset shall be actuated by illuminated pushbutton.

2.7 MANUAL MOTOR CONTROLLER

A. Manufacturers:

B. Product Description: NEMA ICS 2, AC general-purpose, Class A, manually operated, full-voltage controller with overload element, red pilot light, and push button operator.

C. Enclosure: NEMA ICS 6, Type to meet conditions of installation.

2.8 FRACTIONAL-HORSEPOWER MANUAL MOTOR CONTROLLER

A. Manual Motor Switches shall be provided as indicated. Units shall have NEMA 1 surface mounted enclosures unless otherwise indicated.

	Cutler-Hammer	Square D	General Electric	Siemens
2-pole	B100B	KG-1	CR1062S2	Class SMF
3-pole	B100C	KG-2	CR1062S3	Class MMS

B. Product Description: NEMA ICS 2, AC general-purpose, Class A, manually operated, full-voltage controller for fractional horsepower induction motors, with thermal overload unit, red pilot light, and toggle operator.

C. Enclosure: NEMA ICS 6, Type to meet conditions of installation.

2.9 AUTOMATIC MOTOR CONTROLLERS

A. Manufacturers:
1. Cutler-Hammer.
2. Square D.
3. General Electric.
4. Siemens.

B. Product Description: NEMA ICS 2, AC general-purpose Class A controller for induction motors rated in horsepower.

C. Control Voltage: 120 volts, 60 Hertz.

D. Product Options and Features:
1. Cover Mounted Pilot Devices: NEMA ICS 5, standard duty type.
2. Pilot Device Contacts: NEMA ICS 5, Form Z, rated A150.

E. Combination Controllers: Combine motor controllers with disconnect in common enclosure, using fusible switch conforming to NEMA KS 1, enclosed knife switch with externally operable handle. Fuse clips: Designed to accommodate NEMA FU 1, Class R fuses. Obtain IEC Class 2 coordinated component protection.

F. Enclosure: NEMA ICS 6, Type to meet conditions of installation.

2.10 GENERAL PURPOSE CONTACTORS

A. Manufacturers:
1. Cutler-Hammer.
2. Square D.
3. General Electric.
4. Siemens.

B. Product Description: NEMA ICS 2, AC general purpose magnetic contactor.

C. Coil operating voltage: 120 volts, 60 Hertz.

D. Poles: To match circuit configuration and control function.

E. Cover Mounted Pilot Devices: NEMA ICS 5, standard-duty type with Form Z contacts, rated A150.

F. Combination Contactors: Combine contactors with thermal magnetic circuit breaker conforming to NEMA AB 1, with integral thermal and instantaneous magnetic trip in each pole.

G. Combination Contactors: Combine contactors with enclosed knife switch conforming to NEMA KS 1, with externally operable handle and fuse clips designed to accommodate NEMA FU 1, Class R fuses.

H. Enclosure: NEMA ICS 6, Type to meet conditions.

2.11 LIGHTING CONTACTORS

A. Manufacturers:
1. Cutler-Hammer, Type C30.
2. Square D, Class 8903, Type LXG.
3. General Electric, Type CR360ML2.
4. Siemens, Type CLM.

B. Product Description: NEMA ICS 2, magnetic lighting contactor.

C. Configuration: Mechanically held, 2 wire control.

D. Coil operating voltage: 120 volts, 60 Hertz.

E. Poles: To match circuit configuration and control function.

F. Contact Rating: Match branch circuit overcurrent protection, considering derating for continuous loads.

G. Cover Mounted Pilot Devices: NEMA ICS 5, standard-duty type with Form Z contacts, rated A150.

H. Combination Contactors: Combine contactors with enclosed knife switch conforming to NEMA KS 1, with externally operable handle and fuse clips designed to accommodate NEMA FU 1, Class R or J fuses.

I. Enclosure: NEMA ICS 6, Type to meet conditions.

2.12 DISTRIBUTION PANELBOARDS

A. Manufacturers:
1. Cutler-Hammer, Model PRL4.
2. Square D, Model I-Line.
3. General Electric, Model Spectra.
4. Siemens, Model P5

B. Product Description: NEMA PB 1, circuit breaker type panelboard.

C. Minimum integrated short circuit rating: 22,000 amperes rms symmetrical.

D. Panelboard bus: Copper.

E. Fusible Switch Assemblies: NEMA KS 1, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle. Furnish interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips: Designed to accommodate NEMA FU 1, Class R fuses.

F. Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Furnish circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

G. Controllers: NEMA ICS 2, AC general-purpose Class A controller for induction motors rated in horsepower.
   1. Control Voltage: 120 volts, 60 Hertz.
   2. Cover Mounted Pilot Devices: NEMA ICS 5, standard duty type.
   3. Pilot Device Contacts: NEMA ICS 5, Form Z, rated A150.

H. Enclosure: NEMA PB 1, Type to meet conditions.

I. Cabinet Front: Surface type, fastened with hinged door (door-in-door) with flush lock, metal directory frame, finished in manufacturer's standard gray enamel.

2.13 BRANCH CIRCUIT PANELBOARDS

A. Provide panelboards rated and sized as indicated in the schedule and shown on the plans:

	Cutler-Hammer	General Electric	Square D	Siemens
Up to 240 Volts	PRL1	AL	NQOD	P-Series
Up to 480 Volts	PRL2	AE	NF	P-Series
Power Distribution	PRL4	SPECTRA	I-Line	P-Series

Or equal by Seimens.

B. Product Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

C. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical.

D. Panelboard Bus: Copper.

E. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. Do not use tandem circuit breakers.

F. Enclosure: NEMA PB 1, Type to meet conditions.

G. Cabinet Front: Flush or Surface cabinet front with concealed trim clamps and door-in-door construction, concealed hinge, metal directory frame, and flush lock keyed alike. Finish in manufacturer's standard gray enamel.

2.14 FUSES

A. All fuses shall be of the same manufacturer, shall have characteristics to insure retention of positive selective coordination as designed, shall be of the same size shown on schedules, and, where not indicated on the drawings, shall be of the required size for proper operation of the equipment protected.

B. Fused rated 600 amperes or less for all general power circuits shall be voltage as required by the system, dual element, UL Class R time-delay type. The design shall provide time-delay of not less than ten seconds at 500% of ampere rating. The

interrupting rating shall be 200,000 amperes RMS symmetrical. Peak let-thru values shall be as established by Underwriters' Laboratories Standard for Class RK1 fuses.

	Bussmann	Gould Shawmut	Little Fuse
250V	LPN-RK	A2D (Amp)R	LLNRK
600V	LPS-RK	A6D (Amp)R	LLSRK

Acceptable Manufacturers: Bussmann, Gould Shawmut, or Little Fuse.

C. Fuses installed in individual motor circuits shall be sized at 125% of motor nameplate current or nameplate current rating for the next standard fuse size, unless otherwise indicated on the drawings or indicated in the manufacturer's instructions for the equipment in which the motor is used.

D. Fuses, 601 amperes to 6000 amperes. The design shall provide time-delay of not less than four seconds at 500% of ampere rating and 45 seconds at 300% of ampere rating. The interrupting rating shall be 200,000 amperes RMS symmetrical. Peak let-thru currents (Ip) and energy let-thru values (I2T) shall not exceed the values established by Underwriters' Laboratories Standard for Class L fuses.

	Bussmann	Gould Shawmu	Little Fuse
600VAC	KRP-C	A4BY	KLPC

Acceptable Manufacturers: Bussmann, Gould Shawmut, or Little Fuse.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install distribution equipment plumb.

B. Select and install overload heater elements in motor controllers to match installed motor characteristics.

C. Provide panelboards in accordance with NEMA PB 1.1.

D. Provide recessed panelboards flush with wall finishes.

E. Provide typed directories for panelboard branch circuit identification. Identify each circuit breaker as to the exact room numbers or area served and the type of circuit, i.e. "Rooms 101-104 lights" or "Corridor 230" or "Toilet 109 exhaust fan". Room numbers and/or names shall match the installed graphics.

3.2 ELECTRICAL SERVICE AND METERING PROVISIONS:

A. Provide electrical service and metering provisions as indicated on the drawings or required by utility company. This contractor shall verify the electrical service with the serving power company prior to bid rough-in and coordinate the installation, notifying the Architect of discrepancies and/or requirements unique to this job that are not indicated on the plans. The contractor shall provide all requirements as directed by the serving utility company at the cost to the contractor.

B. The contractor shall provide all materials and labor shown on the drawings and/or required for the complete installation except as specifically indicated to be by the serving utility.

C. Where there is a charge for utility furnished items, it shall be paid by the contractor.

3.3 ELECTRICAL LOAD BALANCING:

A. Contractor shall be responsible for balancing electrical loads at each panel so that neutral current flow is reduced to the lowest possible level and all phase legs are as equally balanced as possible. Contractor shall relocate circuit breakers or individual branch circuits as required to accomplish electrical load balance. After load balancing is complete, it shall be verified with the facility fully powered and operating in its intended manner. Re-check load balance six (6) months after substantial completion.

3.4 DRY TYPE DISTRIBUTION TRANSFORMERS:

A. Mount transformers 75 KVA and smaller with wall-mounted brackets from wall and structure above, unless otherwise indicated. Transformers larger than 75 KVA to be floor mounted on 4 inch thick reinforced concrete pads, unless otherwise indicated.

B. The transformer is to be isolated from its supports with 3/8" neoprene pads.

C. Final conduit connections to the transformer shall be flexible metal conduit for a minimum distance of 10 conduit diameters.

3.5 GROUNDING:

A. Electrical grounding shall conform to Article 250 of the N.E.C. Neutral conductors, cable shields and sheaths, metallic conduits, junction boxes enclosures and all conductive non-current carrying parts of equipment shall be grounded.

B. Ground rods shall be copper clad steel minimum 5/8" diameter by 8 feet long driven into the ground at least 8 feet, 6 inches.

3.6 TERMINATION LUGS:

Contractor shall coordinate size of termination lugs in all equipment with conductor sizes indicated on plan. Contractor shall notify equipment vendor of special lug requirements.

END OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes wall switches; wall dimmers; receptacles; multioutlet assembly; device plates, decorative box covers, and hand dryer.

B. Related Sections:
1. Section 16200 - Raceway and Boxes for Electrical Systems: Outlet boxes for wiring devices.
2. Section 16250 - Floor Boxes for Electrical Systems: Service fittings for receptacles installed on floor boxes.
3. Section 16250 - Floor Boxes for Electrical Systems: Poke-through receptacles.
4. Section 16200 - Underfloor Raceways for Electrical Systems: Service fittings for receptacles installed in underfloor raceways.

1.2 REFERENCES

A. National Electrical Manufacturers Association:
1. NEMA WD 1 - General Requirements for Wiring Devices.
2. NEMA WD 6 - Wiring Devices-Dimensional Requirements.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit manufacturer's catalog information showing dimensions, colors, and configurations.

C. Samples: Submit two samples of each wiring device and wall plate illustrating materials, construction, color, and finish.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years [documented] experience.

1.5 EXTRA MATERIALS

A. Section 01 70 00 - Execution and Closeout Requirements: Spare parts and maintenance products.

B. Furnish two of each style, size, and finish wall plate.

PART 2 PRODUCTS

2.1 WALL SWITCHES

A. Toggle switches: Specifications grade, AC only, 20A 120-277V rating, full size handle (framed toggle not acceptable), side and back wired (screw terminal only; pressure terminal not acceptable). The type switch shall be indicated on the drawings.

	Hubbell	Leviton	P & S
single pole	HBL 1221	1221-2	20AC1
3-way	HBL 1223	1223-2	20AC3
4-way	HBL 1224	1224-2	20AC4
Pilot light	HBL 1221-PL	1221-PLR	20AC1-RPL

Acceptable manufacturers: Arrow Hart, Bryant, G.E., Hubbell, Leviton, or P & S.

2.2 WALL DIMMERS

A. Manufacturers:
1. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: NEMA WD 1; Semiconductor dimmer for incandescent lamps.

C. Body and Handle: White plastic with linear slide.

D. Power Rating: As required for circuit load.

E. Accessory Wall Switch: Match dimmer appearance.

2.3 RECEPTACLES

A. Duplex receptacle: Specification grade, AC, 15A 125V rating, automatic grounding clip, side and back wired (screw terminals):

	Hubbell	Leviton	P & S
standard	HBL 5252I	5252-I	5252-I
safety	HBL 8200SG	5262-SG	TR62H
isolated ground	IG5262	5262-IG	IG6200

Acceptable manufacturers: Arrow Hart, Bryant, G.E., Hubbell, Leviton, or P & S.

2.4 WALL PLATES

A. Manufacturers:
1. Substitutions: Section 01 60 00 - Product Requirements.

B. Decorative Cover Plate: White.

C. Jumbo Cover Plate:White.

D. Weatherproof Cover Plate: Provide cast aluminum weatherproof device plates with hinged cover for each outlet for exterior receptacles as indicated. When outdoor receptacle is permanently in use (heat tape, etc.) provide a cover listed for wet locations "open".

	Hubbell	Leviton	P & S
standard	WP26	6196	CA26GV
open	WP26-MHP	6196-FS	3703

Acceptable manufacturers: Bell, Hubbell, Leviton, P & S, Perfectline, Arrow Hart, or G.E.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify outlet boxes are installed at proper height.

C. Verify wall openings are neatly cut and completely covered by wall plates.

D. Verify branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.2 PREPARATION

A. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install devices plumb and level.

B. Install switches with OFF position down.

C. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

D. Do not share neutral conductor on load side of dimmers.

E. Install receptacles with grounding pole on top.

F. Connect wiring device grounding terminal to outlet box with bonding jumper and branch circuit equipment grounding conductor.

G. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

H. Connect wiring devices by wrapping solid conductor around screw terminal. Install stranded conductor for branch circuits 10 AWG and smaller. When stranded conductors are used in lieu of solid, use crimp on fork terminals for device terminations. Do not place bare stranded conductors directly under device screws.

I. Use jumbo size plates for outlets installed in masonry walls.

J. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 26 05 33 to obtain mounting heights [as specified and] as indicated on drawings.

B. Install wall switch 48 inches above finished floor.

C. Install convenience receptacle 18 inches above finished floor.

D. Install convenience receptacle 6 inches above counter.

E. Install dimmer 48 inches above finished floor.

3.5 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect each wiring device for defects.

C. Operate each wall switch with circuit energized and verify proper operation.

D. Verify each receptacle device is energized.

E. Test each receptacle device for proper polarity.

F. Test each GFCI receptacle device for proper operation.

3.6 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Adjust devices and wall plates to be flush and level.

3.7 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements: Final cleaning.

B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 26 50 00: LIGHTING

PART 1 - GENERAL

1.1 SCOPE:

Work of this Section shall include the following items:

Interior and Exterior LED

1.2 REFERENCED STANDARDS:

NFPA 70 - National Electrical Code
NFPA 101 - Life Safety Code

PART 2 - PRODUCTS

2.1 LIGHTING FIXTURES: <S>

Provide fixtures including interior and exterior fixtures and emergency type fixtures as indicated on the plans and described in the schedule.

Fixtures shall be complete with internal wiring, brackets, fittings, lenses, louvers, guards, reflectors, pole supports and accessories as required, indicated or detailed.

2.1.3 Provide LED lighting fixtures as indicated on plan. LED drivers shall be compatible with fixture design and fixture design shall allow for proper heat sink capabilities to allow fixture to properly function in the environment in which it will be installed.

PART 3 - EXECUTION

3.1 LIGHTING FIXTURES:

Installation methods for each fixture shall be as indicated or detailed and as recommended by the fixture manufacturer for the application. Supports such as mounting brackets, hangers, clamps, etc., shall be provided in the best practical manner consistent with good workmanship and appearance. Fixtures shall be independently supported from the building structure.

Any fixture damaged during construction prior to final acceptance of the project shall be replaced or repaired to the satisfaction of the Architect.

Contractor shall note architectural finish schedules, reflected ceiling plan and existing conditions and furnish proper mounting accessories or trim as required to properly mount each fixture type.

Recessed fixtures shall be provided with mounting frames or rings and shall finish flush to the ceiling without light leaks. Fixtures shall be connected by means of 3/8" flexible metal conduit (max 6'-0" length) from outlet boxes mounted above or alongside the fixture. Wire size in runouts to individual fixtures may be reduced to #14 AWG on 120 volt circuits and #16 AWG on 277 volt circuits.

Fixtures exposed to outdoor temperatures shall be rated for 0 degree Fahrenheit operation.

Adjustable fixtures both inside and outside shall be adjusted by the contractor to illuminate the intended area at the direction of the owner. Adjustment shall be during the hours of darkness.

END OF SECTION

DIVISION 27
COMMUNICATIONS



SECTION 27 05 00 – FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1. DESCRIPTION:

A. This section of the specification includes the furnishing, installation, connection and testing of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete, operative, coordinated system. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, Fire Alarm Control Panel (FACP), auxiliary control devices, annunciators, Ethernet and/or digital alarm communications to central stations and wiring as shown on the drawings and specified herein.

B. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for Local Protected Premises Signaling Systems except as modified and supplemented by this specification. The system field wiring shall be supervised either electrically or by software-directed polling of field devices.

1. The Secondary Power Source of the fire alarm control panel will be capable of providing at least 24 hours of backup power with the ability to sustain 5 minutes in alarm at the end of the backup period.

C. The fire alarm system shall be manufactured by an ISO 9001 certified company and meet the requirements of BS EN9001: ANSI/ASQC Q9001-1994.

D. The FACP and peripheral devices shall be manufactured or supplied 100% by a single U.S. manufacturer (or division thereof).

E. Underwriters Laboratories Inc. (UL) - USA:

No. 38 Manually Actuated Signaling Boxes
No. 50 Cabinets and Boxes
No. 864 Control Units for Fire Protective Signaling Systems
No. 268 Smoke Detectors for Fire Protective Signaling Systems
No. 268A Smoke Detectors for Duct Applications
No. 346 Waterflow Indicators for Fire Protective Signaling Systems
No. 464 Audible Signaling Appliances
No. 521 Heat Detectors for Fire Protective Signaling Systems
No. 1971 Visual Notification Appliances

F. The installing company shall employ NICET (minimum Level II Fire Alarm Technology) technicians on site to guide the final check-out and to ensure the systems integrity.

G. The FACP shall meet requirements of UL ANSI 864 Ninth Edition

1.2. SCOPE:

A. An intelligent, microprocessor-controlled, fire alarm detection system shall be installed in accordance to the project specifications and drawings.

B. Basic Performance:

1. Initiation Device Circuits (IDC) shall be wired Class B (NFPA Style B) as part of an addressable device connected by the SLC Circuit.

2. Notification Appliance Circuits (NAC) shall be wired Class B (NFPA Style Y) as part of an addressable device connected by the SLC Circuit.

3. All circuits shall be power-limited, per UL864 requirements.

4. A single ground fault or open circuit on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.

5. Alarm signals arriving at the main FACP shall not be lost following a primary power failure or outage of any kind until the alarm signal is processed and recorded.

C. BASIC SYSTEM FUNCTIONAL OPERATION

When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:

1. The system Alarm LED on the FACP shall flash.

2. A local sounder with the control panel shall sound.

3. A backlit 80-character LCD display on the FACP shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location within the protected premises.

4. In response to a fire alarm condition, the system will process all control programming and activate all system outputs (alarm notification appliances and/or relays) associated with the point(s) in alarm. Additionally, the system shall send events to a central alarm supervising station via either dial-up over PSTN or Internet or Intranet via PSDN or virtual private network.

1.3 REFERENCED STANDARDS:

NFPA 70 - National Electrical Code
NFPA 72 - National Fire Alarm Code
ASME A117.1 Safety Code for Elevators and Escalators
NFPA 101 - Life Safety Code
Americans with Disabilities Act - Accessibility Guidelines for Building and Facilities (ADA-AG)

1.4 SHOP DRAWINGS AND APPROVALS:

The Fire Alarm System Subcontractor shall prepare complete shop drawings and dimensional working drawings for the entire installation in accordance with the State Fire Marshal's Requirements. First submit to the architect for approval of the basic arrangement and layout. Such submittal will be noted for corrections or changes if required. Submit in six (6) copies. Include with six submittal copies a plan review application with all necessary information completed and application fee. The Professional of Record will fill in his section and forward two (2) copies of submittals, the plan review application (and any fee) to the State Fire Marshal's office for review. Upon written approval from the State Fire Marshal's Office, the two State Fire Marshal approved drawings will be returned to the Professional of Record who will forward one copy to the General Contractor. This State Fire Marshal approved set must remain on the project site throughout the duration of the project. Contractor shall include as a minimum in the submittal to the Fire Marshal the following: (as applicable)

FIRE ALARM SUBMITTAL REQUIREMENTS

Drawings

Two copies of each.
Drawn to an indicated scale. (1/8" = 1'-0" minimum)
Site plan.
Dimensions of each room.

Occupancy of each room.
Ceiling height.
Cross section (if other than flat ceiling).
Riser diagram
floor
zone
circuit
Logic diagram (first "a" happens, then "b" happens)
All connections to other systems, e.g.
sprinkler system valves, flow switches, etc.
elevator recall, shut down, etc.
Legend
Title block

Means of Occupant Notification
Horns
Speakers
Strobes

Means of Fire Department Notification
Digital alarm communicator transmitter (DACT or digital dialer)
two telephone lines
between telephone line and PBX
Central station

Power Sources
battery calculations
emergency generator
fuel supply
24-hour trained attendant

Full Cut Sheet and Manuals on ALL Devices

All Existing Systems or Devices

Completed Application

Review Fee

It shall be the fire alarm contractor's responsibility to pay any and all submittal fees and provide any and all material and labor required to obtain an approved submittal by the Fire Marshal.

PART 2 - PRODUCTS <S><OM>

2.1 MAIN FIRE ALARM CONTROL PANEL:

A. The FACP shall be non-proprietary and shall contain a microprocessor-based Central Processing Unit (CPU). The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules, printer, annunciators, Digital Dialer and Ethernet Communicators and other system controlled devices. Ethernet communications shall be via a Fire-Lite Model IPDACT. Central station supervisory equipment shall be a Teldat Corporation Visoralarm-Plus 2U listed to UL-864 standards.

B. Operator Control

1. Acknowledge Switch:

a. Activation of the control panel Acknowledge switch in response to new alarms and/or troubles shall silence the local panel piezo electric signal and change the alarm and trouble LEDs from flashing mode to steady-ON mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the 80-character LCD display to the next alarm or trouble condition.
b. Depression of the Acknowledge switch shall also silence all remote annunciator piezo sounders.

2. Alarm Silence Switch:

Activation of the alarm silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silenceable by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.

3. Alarm Activate (Drill) Switch:

The Alarm Activate switch shall activate all notification appliance circuits. The drill function shall latch until the panel is silenced or reset.

4. System Reset Switch:

Activation of the System Reset switch shall cause all electronically-latched initiating devices, appliances or software zones, as well as all associated output devices and circuits, to return to their normal condition.

5. Lamp Test:

The Lamp Test switch shall activate all system LEDs and light each segment of the liquid crystal display.

C. System Capacity and General Operation

1. The control panel shall provide, or be capable of, expansion to 636 intelligent/addressable devices.

2. The control panel shall include Form-C Alarm, Trouble and Supervisory relays rated at a minimum of 2.0 amps @ 30 VDC. It shall also include programmable Notification Appliance Circuits (NACs) capable of being wired as NFPA Style Y (Class B) or NFPA Style Z (Class A).

3. The fire alarm control panel shall include an operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display (LCD), individual color-coded system status LEDs, and an alphanumeric keypad for the field programming and control of the fire alarm system.

4. All programming or editing of the existing program in the system shall be achieved without special equipment and without interrupting the alarm monitoring functions of the fire alarm control panel. The system shall be fully programmable, configurable, and expandable in the field without the need for special tools, PROM programmers or PC based programmers. It shall not require replacement of memory ICs to facilitate programming changes. The control unit will support the ability to upgrade its operating program using FLASH memory technology. The unit shall provide the user with the ability to program from either the included keypad, a standard PS2-style PC keyboard or from a computer running upload/download software.

5. The system shall allow the programming of any input to activate any output or group of outputs. Systems which have limited programming (such as general alarm), have complicated programming (such as a diode matrix), are not considered suitable substitutes.

6. The FACP shall provide the following features:

a. Drift compensation to extend detector accuracy over life. Drift compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.

b. Detector sensitivity test, meeting requirements of NFPA 72, Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.

c. The ability to display or print system reports.

d. Alarm verification, with counters and a trouble indication to alert maintenance personnel when a detector enters verification an excessive number of times.

e. Positive Alarm Sequence (PAS presignal), meeting NFPA 72 requirements.

f. Rapid manual station reporting.

g. Non-alarm points for general (non-fire) control.

h. Periodic detector test, conducted automatically by the software.

i. Walk test, with a check for two detectors set to same address.

7. The FACP shall be capable of coding Notification Appliance Circuits in March Time Code (120 PPM), Temporal (NFPA 72), and California Code. Main panel notification circuits shall also automatically synchronize any of the following manufacturer's notification appliances connected to them: System Sensor, Wheelock, or Gentex with no need for additional synchronization modules.

D. Central Microprocessor

1. The microprocessor shall be a state-of-the-art and it shall communicate with, monitor and control all external interfaces. A "watch dog" timer circuit to detect and report microprocessor failure.

2. The microprocessor shall contain and execute all specific actions to be taken in the condition of an alarm. Control programming shall be held in non-volatile programmable memory, and shall not be lost even if system primary and secondary power failure occurs.

3. The microprocessor shall also provide a real-time clock for time annotation of system displays, printer, and history file.

4. A special program check function shall be provided to detect common operator errors.

5. An auto-programming capability (self-learn) shall be provided to quickly identify devices connected on the SLC and make the system operational.

6. For flexibility and to ensure program validity, an optional Windows(TM) based program utility shall be available. This program shall be used to off-line program the system with batch upload/download. This program shall also have a verification utility which scans the program files, identifying possible errors. It shall also have the ability to compare old program files to new ones, identifying differences in the two files to allow complete testing of any system operating changes. This shall be in incompliance with the NFPA 72 requirements for testing after system modification.

E. Local Keyboard Interface

1. In addition to an integral keypad, the fire alarm control panel will accept a standard PS2-style keyboard for programming, testing, and control of the system. The keyboard will be able to execute the system functions ACKNOWLEDGE, SIGNALS SILENCED, DRILL and RESET.

F. Display

1. The display shall provide all the controls and indicators used by the system operator and may also be used to program all system operational parameters.

2. The display shall include status information and custom alphanumeric labels for all intelligent detectors, addressable modules, internal panel circuits, and software zones.

3. The display shall contain an alphanumeric, text-type display and dedicated LEDs for the annunciation of AC POWER, FIRE ALARM, SUPERVISORY, TROUBLE, MAINTENANCE, ALARM SILENCED, DISABLED, BATTERY, and GROUND conditions.

4. The display keypad shall be part of the standard system and have the capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be provided to prevent unauthorized system control or programming.

5. The display shall include the following operator control switches:
ACKNOWLEDGE, ALARM SILENCE, DRILL (alarm activate), and SYSTEM RESET.

G. Signaling Line Circuit (SLC)

1. The SLC interface shall provide power to and communicate with up to 159 intelligent detectors (ionization, photoelectric or thermal) addressable Beam Detectors, and 159 addressable pull stations, intelligent modules (monitor or control) for a system capacity of 636 devices (2 SLC). Each SLC shall be capable of NFPA 72 Style 4, Style 6, or Style 7 (Class A or B) wiring.

2. The CPU shall receive information from all intelligent detectors to be processed to determine whether normal, alarm, pre-alarm, or trouble conditions exist for each detector. The software shall automatically compensate for the accumulation of dust in each detector up to allowable limits. The information shall also be used for automatic detector testing and for the determination of detector maintenance conditions.

3. The detector software shall meet NFPA 72, Chapter 10 requirements and be certified by UL as a calibrated sensitivity test instrument.

H. Serial Interfaces

1. The system shall provide a means of interfacing to UL Listed Electronic Data Processing (EDP) peripherals using the EIA-232 communications standard.

2. One EIA-232 interface shall be used to connect an UL-Listed 80-column printer. The printer shall communicate with the control panel using an interface complying with Electrical Industries Association standard EIA-232D. Power to the printer shall be 120 VAC @ 60 Hz.

I. The control panel will have the capability of Reverse Polarity Transmission or connection to a Municipal Box for compliance with applicable NFPA standards.

J. Digital Alarm Communicator Transmitter (DACT) and Internet Protocol Digital Alarm Communicator Transmitter (IPDACT). The DACT is an interface for communicating digital information between a fire alarm control panel and a UL-Listed central station. When the optional IPDACT Ethernet module is

connected to the on board DACT, the system shall be capable of transmitting contact ID formatted alarms to a central station equipped with a compatible IP receiver via Ethernet over a private or public WAN/LAN, Intranet or Ethernet.

1. The IPDACT communicator shall be an integral module component of the fire alarm control panel enclosure.

2. The IPDACT communicator shall include connections to the alarm panel's phone outputs and shall convert the contact ID protocol in DTMF form into UDP Ethernet Packets. It shall include the ability for simultaneous reporting of panel events up to three different IP addresses.

3. The IPDACT communicator shall be completely field-programmable locally from a PC via a serial port or via Ethernet and Telnet.

4. The IPDACT communicator shall be capable of transmitting events in contact ID format.

5. Communication shall include vital system status such as:
   - Independent Zone (Alarm, trouble, non-alarm, supervisory)
   - Independent Addressable Device Status
   - AC (Mains) Power Loss
   - Low Battery and Earth Fault
   - System Off Normal
   - 12 and 24 Hour Test Signal
   - Abnormal Test Signal (per UL requirements)
   - EIA-485 Communications Failure
   - IP Line Failure

6. The IPDACT communicator shall support independent zone/point reporting via the Contact ID format. In this format, the IPDACT shall support the transmission of addressable points within the system. This format shall enable the central station to have exact details concerning the location of the fire for emergency response. The IPDACT communicator shall be capable of providing simulated phone lines to the FACP and panel communication over IP shall be transparent to the panels' normal operation over phone lines.

7. The IPDACT communicator shall utilize a supervisory heart beat signal of no less than once every 90 seconds insuring multiplexed level line supervision. Loss of Internet or Intranet connectivity shall be reported in no more than 200 seconds. Alarm events shall be transmitted to a central station in no less than 90 seconds from time of initiation to time of notification.

8. The supervising station shall consist of a Teldat Corporation Visoralarm-Plus 2U receiver. Said receiver shall contain a smart card for backup of all account data. Backup smart card shall initiate a new receiver with all account information in Less than 60 seconds from power up.

K. Stand Alone Voice Evacuation Control Panel

1. A standalone Voice Evacuation Control Panel shall be available from the same manufacturer of the main fire alarm system.

2. This Voice Evacuation Control Panel shall work stand alone or as a slave to the Main Fire Alarm Control Panel.

3. Shall have as minimum requirements:

   a. Integral 50 Watt, 25 Vrms audio amplifier with optional converter for 70.7 volt systems.

b. The system shall be capable of expansion to 100 watts total via the insertion of an additional 50 watt audio amplifier module into the same cabinet.

c. Speaker circuit shall be capable of either Class A or B wiring.

d. Integral Digital Message Generator with a memory capacity for up to 60 seconds of messaging. The Digital Message Generator shall be capable of producing five distinct messages (12 seconds each). These messages shall field programmable without the use of additional equipment.

e. Built in alert tone generators with steady, slow whoop, high/low and chime tone field programmable.

f. The Voice Evacuation Control Panel will be capable of detecting and annunciating the following conditions: Loss of Power (AC and DC), System Trouble, Ground Fault, Alarm, Microphone Trouble, Message Generator Trouble, Tone Generator Trouble, and Amplifier Fault.

4. The Voice Evacuation Control Panel shall be fully supervised including microphone, amplifier output, message generator, speaker wiring, and tone generation.

5. Speaker outputs shall be fully power-limited.

6. Amplifiers shall be independently powered and protected to eliminate a short on one circuit from affecting other circuits.

7. The Voice Evacuation Control Panel shall provide full supervision on both active (alarm or music) and standby conditions.

8. An optional zone splitter version shall be available that permits splitting speaker circuits into 8 specific zones.

9. An optional distributed amplifier unit shall be available that permits splitting speaker circuits into up to a total of 24 zones when two distributed amplifiers are combined with the master unit.

10. An optional fire fighter telephone unit with keypad shall be available that permits up to a total of 24 telephone circuits.

L. Speakers:

1. All speakers shall operate on 25 VRMS or with field selectable output taps from 0.25 to 2.0 Watts.

2. Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).
3. Frequency response shall be a minimum of 400 HZ to 4000 HZ.

4. The back of each speaker shall be sealed to protect the speaker cone from damage and dust.

M. Enclosures:

1. The control panel shall be housed in a UL-listed cabinet suitable for surface or semi-flush mounting. The cabinet and front shall be corrosion protected and painted red via the powder coat method with manufacturer's standard finish.

2. The back box and door shall be constructed of steel with provisions for electrical conduit connections into the sides and top.

3. The door shall provide a key lock and shall provide for the viewing of all indicators.

4. The cabinet shall accept a chassis containing the PCB and to assist in quick replacement of all the electronics including power supply shall require no more than two bolts to secure the panel to the enclosure back box.

N. Field Charging Power Supply: The FCPS is a device designed for use as either a remote 24-volt power supply or as a booster for powering Notification Appliances.

1. The FCPS shall offer up to 8.0 amps (6.0 amps continuous) of regulated 24 volt power. It shall include an integral charger designed to charge 18.0 amp hour batteries.

2. The Field Charging Power Supply shall have two input triggers. The input trigger shall be a Notification Appliance Circuit (from the fire alarm control panel) or a control relay. Four NAC outputs, wired NFPA Style Y or Z, shall be available for connection to the Notification devices.

3. The FCPS shall optionally provide synchronization of all connected strobes or horn strobe combinations when either System Sensor, Wheelock or Gentex devices are installed.

4. The FCPS shall function as a sync follower as well as a sync generator.

5. The FCPS shall include a surface mount backbox.

6. The Field Charging Power Supply shall include the ability to delay the reporting of an AC fail condition per NFPA requirements.

7. The FCPS shall provide 24 VDC regulated and power-limited circuitry per UL standards.

O. Power Supply:

1. The main power supply for the fire alarm control panel shall provide 7.0 amps of available power for the control panel and peripheral devices.

2. Provisions will be made to allow the audio-visual power to be increased as required by adding modular expansion audio-visual power supplies.

3. Positive-Temperature-Coefficient (PTC) thermistors, circuit breakers, or other over-current protection shall be provided on all power outputs. The power supply shall provide an integral battery charger or may be used with an external battery and charger systems. Battery arrangement may be configured in the field.

4. The main power supply shall continuously monitor all field wires for earth ground conditions.

5. The main power supply shall operate on 120 VAC, 60 Hz, and shall provide all necessary power for the FACP.

P. Programmable Electronic Sounders:

1. Electronic sounders shall operate on 24 VDC nominal.

2. Electronic sounders shall be field programmable without the use of special tools, to provide slow whoop, continuous, or interrupted tones with an output sound level of at least 90 dBA measured at 10 feet from the device.

3. Electronic sounders shall be flush or surface mounted as shown on plans.

Q. Strobe lights shall meet the requirements of the ADA, UL Standard 1971 and shall meet the following criteria:

1. The maximum pulse duration shall be 2/10 of one second.

2. Strobe intensity shall meet the requirements of UL 1971.

3. The flash rate shall meet the requirements of UL 1971.

R. Audible/Visual Combination Devices:

1. Shall meet the applicable requirements of Section A listed above for audibility.

2. Shall meet the requirements of Section B listed above for visibility.

S. Specific System Operations

1. Alarm Verification: Each of the intelligent addressable smoke detectors in the system may be independently programmed for verification of alarm signals. The alarm verification time period shall not exceed 2 minutes.

2. Point Disable: Any addressable device or conventional circuit in the system may be enabled or disabled through the system keypad.

3. Point Read: The system shall be able to display the following point status diagnostic functions:
   a. Device status
   b. Device type
   c. Custom device label
   d. Device zone assignments

4. System Status Reports: Upon command from an operator of the system, a status report will be generated and printed, listing all system status.

5. System History Recording and Reporting: The fire alarm control panel shall contain a history buffer that will be capable of storing up to 1000 events. Each of these activations will be stored and time and date stamped with the actual time of activation. The contents of the history buffer may be manually reviewed, one event at a time, or printed in its entirety. The history buffer shall use non-volatile memory. Systems that use volatile memory for history storage are not acceptable substitutes.

6. Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent detector and shall analyze the detector responses over a period of time. If any intelligent detector in the system responds with a reading that is above or below normal limits, then the system will enter the trouble mode, and the particular detector will be annunciated on the system display. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.

7. Pre-Alarm Function: The system shall provide two levels of pre-alarm warning to give advance notice of a possible fire situation. Both pre-alarm levels shall be fully field adjustable. The first level shall give an audible indication at the panel. The second level shall give an audible indication and may also activate control relays. The system shall also have the ability to activate local detector sounder bases at the pre-alarm level, to assist in avoiding nuisance alarms.

8. The fire alarm control panel shall include Silent and Audible Walk Test functions - Silent and Audible. It shall include the ability to test initiating device circuits and Notification Appliance Circuits from the field without returning to the panel to reset the system. The operation shall be as follows:

a. The Silent Walk Test will not sound NACs but will store the Walk Test information in History for later viewing.

b. Alarming an initiating device shall activate programmed outputs, which are selected to participate in Walk Test.

c. Introducing a trouble into the initiating device shall activate the programmed outputs.

d. Walk Test shall be selectable on a per device/circuit basis. All devices and circuits which are not selected for Walk Test shall continue to provide fire protection and if an alarm is detected, will exit Walk Test and activate all programmed alarm functions.

e. All devices tested in walk test shall be recorded in the history buffer.

f. All devices not tested in walk test shall be recorded in the history buffer.

9. Waterflow Operation
An alarm from a waterflow detection device shall activate the appropriate alarm message on the control panel display; turn on all programmed Notification Appliance Circuits and shall not be affected by the Signal Silence switch.

10. Supervisory Operation
An alarm from a supervisory device shall cause the appropriate indication on the control panel display, light a common supervisory LED, but will not cause the system to enter the trouble mode.

11. Signal Silence Operation
The FACP shall have the ability to program each output circuit (notification circuit or relay) to upon depression of the Signal Silence switch.

12. Non-Alarm Input Operation
Any addressable initiating device in the system may be used as a non-alarm input to monitor normally open contact type devices. Non-alarm functions are a lower priority than fire alarm initiating devices.

2.2. SYSTEM COMPONENTS:

A. Addressable Pull Box (manual station)

1. Addressable pull boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key.

2. All operated stations shall have a positive, visual indication of operation and utilize a key type reset.

3. Manual pull stations shall be constructed of Lexan with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches (44 mm) or larger.

B. Intelligent Multi-Sensing Detector

1. The intelligent detector shall be an addressable device which is capable of detecting multiple threats by employing photoelectric and thermal technologies in a single unit. This detector shall utilize advanced electronics which react to slow smoldering fires (photoelectric) and heat (thermal) all within a single sensing device.

2. The multi-detector shall include two bicolor LEDs for 360-degree viewing.

3. Automatically adjusts sensitivity levels without the need for operator intervention or programming. Sensitivity increases with heat.

C. Intelligent Photoelectric Smoke Detector

1. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.

2. The detectors shall be ceiling-mounted and available in an alternate model with an integral fixed 135-degree heat-sensing element.

3. Each detector shall contain a remote LED output and a built-in test switch.

4. Detector shall be provided on a twist-lock base.

5. It shall be possible to perform a calibrated sensitivity and performance test on the detector without the need for the generation of smoke. The test method shall test all detector circuits.

6. A visual indication of an alarm shall be provided by dual latching Light Emitting Diodes (LEDs), on the detector, which may be seen from ground level over 360 degrees. These LEDs shall periodically flash to indicate that the detector is in communication with the control panel.

7. The detector shall not go into alarm when exposed to air velocities of up to 1500 feet per minute (fpm).

8. The detector screen and cover assembly shall be easily removable for field cleaning of the detector chamber.

9. All field wire connections shall be made to the base through the use of a clamping plate and screw.

D. Projected Addressable Beam Detector

1. The projected beam type shall be a 4-wire 24 VDC intelligent, addressable projected beam smoke detector device.

2. The detector shall be listed to UL 268 and shall consist of a single transmitter\receiver and corresponding non powered reflector.

3. The detector shall operate in either a short range (16' - 230') or long range (16' – 328') when used with an extender module.

4. The temperature range of the device shall be -22 degrees F to 131 degrees F.

5. The detector shall feature an optical sight and 2-digit signal strength meter to ensure proper alignment of unit without need of special tools.

6. The unit shall be both ceiling and wall mountable.

7. The detector shall have the ability to be tested using calibrated test filters or magnet-activated remote test station.

8. The detector shall have four standard sensitivity selections along with two automatic self-adjusting settings. When either of the two automatic settings is selected the detector will automatically adjust its sensitivity using advanced software algorithms to select the optimum sensitivity for the specific environment.

E. Intelligent Ionization Smoke Detector

1. The detectors shall use the dual-chamber ionization principal to measure products of combustion and shall, on command from the control panel, send data to the panel representing the analog level of products of combustion.

F. Intelligent Thermal Detectors

1. Thermal detectors shall be intelligent addressable devices rated at 135 degrees Fahrenheit (58 degrees Celsius) and have a rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute. It shall connect via two wires to the fire alarm control panel signaling line circuit.

G. Intelligent Duct Smoke Detector

1. The smoke detector housing shall accommodate either an intelligent ionization detector or an intelligent photoelectric detector, of that provides continuous analog monitoring and alarm verification from the panel.

2. When sufficient smoke is sensed, an alarm signal is initiated at the FACP, and appropriate action taken to change over air handling systems to help prevent the rapid distribution of toxic smoke and fire gases throughout the areas served by the duct system.

H. Addressable Dry Contact Monitor Module

1. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any normally open dry contact device) to one of the fire alarm control panel SLCs.

2. The monitor module shall mount in a 4-inch square (101.6 mm square), 2-1/8 inch (54 mm) deep electrical box.

3. The IDC zone shall be suitable for Style D or Style B operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.

4. For difficult to reach areas, the monitor module shall be available in a miniature package and shall be no larger than 2-3/4 inch (70 mm) x 1-1/4 inch (31.7 mm) x 1/2 inch (12.7 mm). This version need not include Style D or an LED.

I. Two-Wire Detector Monitoring

1. Means shall be provided for the monitoring of conventional Initiating Device Circuits populated with 2-wire smoke detectors as well as normally-open contact alarm initiating devices (pull stations, heat detectors, etc).

2. Each IDC of conventional devices will be monitored as a distinct address on the polling circuit by

an addressable module. The module will supervise the IDC for alarms and circuit integrity (opens).

3. The monitoring module will be compatible, and listed as such, with all devices on the supervised circuit.

4. The IDC zone may be wired for Style D or Style B (Class A or B) operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.

5. The monitoring module shall be capable of mounting in a 4-inch square (101.6 mm square), 2-1/8 inch (54 mm) deep electrical box or in an surface mount backbox.

J. Addressable Control Relay Module

1. Addressable control relay modules shall be provided to control the operation of fan shutdown and other auxiliary control functions.

2. The control module shall mount in a standard 4-inch square, 2-1/8 inch deep electrical box, or to a surface mounted backbox.

3. The control relay module will provide a dry contact, Form-C relay. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relays may be energized at the same time on the same pair of wires.

4. The control relay module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC.

K. Six Output Addressable Control Relay Module

1. Up to 6 Addressable intelligent control relay modules combined on one circuit board shall be provided to control the operation of fan shutdown and other auxiliary control functions.

2. Using rotary address switches, the first module shall be addressed from 01 to 154 while the remaining modules shall be automatically assigned to the next five higher addresses. Note, binary dip switches for setting address are not acceptable.

3. Provision shall be included for disabling a maximum of three unused modules

4. A single isolated set of dry relay form C contacts shall be provided for each of the 6 module addresses, which shall be capable of being wired for either a normally-open or normally-closed operation.

5. The module shall allow an addressable control panel to switch these contacts on command.
6. The module shall contain removable plug in terminal blocks capable of supporting 12 AWG to 18 AWG wire.

7. The control relays mounted on the module shall be suitable for pilot duty applications and rated for a maximum of 3.0 amps at 30 VDC, resistive, non-coded and 2.0 amps at 30 VDC maximum, resistive, coded.

L. Six-Zone Interface Module

1. A six zone interface module shall be provided as an interface between the addressable panel and two-wire conventional detection zones.

2. A common SLC input shall be used for all modules, and the initiating device circuits shall share a

common external supervisory supply and ground.

3. The first address on the interface module shall be addressed from 01 to 154 while the remaining modules are automatically assigned to the next five higher addresses.

4. Address shall be set using decimal encoded rotary address switches. Binary address switches are not acceptable.

5. Provision shall be included for disabling a maximum of two unused addresses of the six available.

6. All two-wire detectors being monitored shall be two-wire compatibility listed with the six zone input module.

7. The six zone input module shall transmit the status of a zone of two-wire detectors to the fire alarm control panel. Status shall be reported as normal, open or alarm.

8. Removable plug-in terminals shall be provided capable of accepting from 18 AWG up to 12 AWG wire.

M. Multiple Two-Wire Detector Monitoring

1. A single multi input module shall be provided for the monitoring of up to 10 conventional Initiating Device Circuits populated with 2-wire smoke detectors as well as normally-open contact alarm initiating devices (pull stations, heat detectors, etc).

2. Each IDC of conventional devices will be monitored as a distinct address on the polling circuit by an addressable point. The module will supervise the IDC for alarms and circuit integrity (opens).

3. The first address on the 10 input boards shall be set from 01 to 150 and the remaining module addresses shall be automatically assigned to the next nine higher addresses.

4. Provision shall be included for disabling a maximum of two unused addresses.

5. The supervised state (normal, open, or short) of the monitored device shall be sent back to the panel. A common SLC input shall be used for all modules, and the initiating device loops shall share a common supervisory supply and ground.
6. The IDC zone may be wired for Style D or Style B (Class A or B) operation. A green LED for each circuit shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel. LEDs shall latch on when a circuit is in alarm.

N. Isolator Module

1. Isolator modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC Style 6 (Class A) or Style 4 (Class B branch). The isolator module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC loop segment or branch. At least one isolator module shall be provided for each floor or protected zone of the building.

2. If a wire-to-wire short occurs, the isolator module shall automatically open-circuit (disconnect) the SLC. When the short circuit condition is corrected, the isolator module shall automatically reconnect the isolated section.

3. The isolator module shall not require any address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an isolator module after its normal operation.

4. The isolator module shall mount in a standard 4-inch (101.6 mm) deep electrical box or in a surface mounted backbox. It shall provide a single LED that shall flash to indicate that the isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.

O. ACS Serially Connected Annunciator

1. The annunciator shall communicate with the fire alarm control panel via a two wire EIA 485 (multi-drop) communications circuit.

2. The annunciator shall require no more than four wires for operation. Annunciation shall include: intelligent addressable points, system software zones, control relays, and notification appliance circuits. The following operations shall also be provided:

a. Up to 32 annunciators, each with up to 64 points may be installed on the system.

b. The annunciator shall include a single electrical key switch to disable all switch functions.

c. The annunciator shall provide alarm and trouble resound, with flash for new conditions.

d. This unit shall provide for each zone: alarm indications, using a red alarm and yellow trouble LEDs, and switches for the control of fire alarm control panel functions. The annunciator will also have an ON-LINE LED, local piezo electric signal, local acknowledge/lamp test switch, and custom slide-in zone/function identification labels.

e. Switches shall be available for remote annunciation and control of output points in the system, system acknowledge, telephone zone select, speaker select, global signal silence, and global system reset within the confines of all applicable standards.

3. This system shall provide a means of interfacing to a graphic style annunciator.

4. The graphic annunciator interface will possess the capability of individually annunciating each individual addressable device in the system.

P. Alphanumeric LCD Type Annunciator (terminal mode):

1. The alphanumeric display annunciator shall be a supervised, remotely located back-lit LCD display containing a minimum of eighty (80) characters for alarm annunciation in clear English text.

2. The LCD annunciator shall display all alarm and trouble conditions in the system.

3. An audible indication of alarm shall be integral to the alphanumeric display.

4. The display shall be UL listed for fire alarm application.

5. It shall be possible to connect up to 32 LCD displays and be capable of wiring distances up to 6,000 feet from the control panel.

6. The annunciator shall connect to a separate, dedicated "terminal mode" EIA-485 interface. This is a two-wire loop connection and shall be capable of distances to 6,000 feet. Each terminal mode LCD display shall mimic the main control panel.

Q. Alphanumeric LCD Type Annunciator (Ann-Bus Mode):

1. The alphanumeric display annunciator shall be a supervised, remotely located back-lit eighty (80) characters LCD display for alarm annunciation in clear English text.

2. The LCD annunciator shall display all alarm and trouble conditions in the system.

3. An audible indication of alarm shall be integral to the alphanumeric display.

4. It shall be possible to connect up to 8 LCD displays and be capable of wiring distances up to 6,000 feet from the control panel.

5. Up to 8 total devices of any kind, LCD, printer gateway, LED, Relay or I/O module may be installed on the ANN-BUS.

2.3. SYSTEM COMPONENTS - ADDRESSABLE DEVICES

A. Addressable Devices - General

1. Addressable devices shall employ the simple-to-set decade addressing scheme.

2. Addressable devices which use a binary-coded address setting method, such as a DIP switch, are not an allowable substitute.

3. Detectors shall be addressable and intelligent and shall connect with two wires to the fire alarm control panel signaling line circuits.

4. Addressable smoke and thermal (heat) detectors shall provide dual alarm and power/polling LEDs. Both LEDs shall flash under normal conditions, indicating that the detector is operational and in regular communication with the control panel, and both LEDs shall be placed into steady illumination by the control panel, indicating that an alarm condition has been detected. An output connection shall also be provided in the base to connect an external remote alarm LED.

5. Using software in the FACP, detectors shall automatically compensate for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter 10.

6. Detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature. Base options shall include a base with a built-in (local) sounder rated for a minimum of 85 DBA, a relay base and an isolator base designed for Style 7 applications.

7. Detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel.

8. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (ION, PHOTO, THERMAL).

9. Detectors shall provide address-setting means using decimal switches.

2.4 BATTERIES:

A. Upon loss of Primary (AC) power to the control panel, the batteries shall have sufficient capacity to power the fire alarm system for required standby time (24 or 60 hours) followed by 5 minutes of alarm.

B. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks for refilling, spills, and leakage shall not be required.

C. If necessary to meet standby requirements, external battery/charger systems may be used.

2.5 SPARE DEVICES:

This contractor shall provide 10% spare manual pull stations s, smoke detectors, duct detectors, audio/visual signals (110 candela, 95 db minimum), and visual signals (110 candela). As a minimum the following quantities will be provided:

(4) manual pull stations
(6) smoke detectors
(6) duct detectors
(8) audio/visual/speaker signals (110 candelas, 95 db minimum)
(8) visual signals (110 candelas)

All air handlers shall be shut down in strict accordance with NFPA 101 and NFPA 72. All areas shall be provided with notification that is 15db above ambient noise levels. All areas shall be provided with visual notification per the authority having jurisdiction.

This contractor shall provide all material and labor to install spare devices as directed in the field by architect, engineer and/or fire marshal. Include spare devices in the battery calculations.

This contractor shall be responsible for paying any and all fees for submittal and resubmittal and for any and all labor and material required to obtain an approved submittal by the State Fire Marshal.

PART 3 - EXECUTION

3.1 INSTALLATION:

The entire system shall be installed in a workmanlike manner, in accordance with approved manufacturer's wiring diagram. The contractor shall furnish all conduit, wiring, outlet boxes, junction boxes, cabinets and similar devices necessary for the complete installation. All wiring shall be of the type recommended by the manufacturer, approved by the local Fire Marshal, and shall be installed in a minimum of 3/4 inch EMT metal conduit throughout.

All penetration of floor slabs and fire walls shall be fire stopped in accordance with all local fire codes.

End of Line Resistors shall be furnished as required for mounting as directed by the manufacturer.

All wiring shall be color coded throughout, to National Electrical Code standards. The system shall be arranged to receive power from one three wire 120 Vac, 15 A supply at Main Fire Alarm Panel and Auxiliary Power Signal Extender Panels. All low voltage operation shall be provided from the fire alarm control panel.

3.2 FIELD QUALITY CONTROL:

The system shall be installed and fully tested under the supervision of a trained manufacturer's representative. The system shall be demonstrated to perform all of the function as specified.

3.3 TESTS:

Reports of any field testing during installation shall be forwarded to the Engineer. Each individual system operation on a circuit by circuit basis shall be tested for its complete operation. The procedure for testing the entire fire alarm system shall be set forth with the consent of the code enforcement official, the Engineer and the manufacturer.

3.4 DOCUMENTATION AND TRAINING:

The contractor shall compile and provide to the owners three (3) complete manual on the completed system to include operating and maintenance instruction, catalog cuts of all equipment and components, as-built wiring diagrams and a manufacturer's suggested spare parts list.

In addition to the above manuals, the contractor shall provide the services of the manufacturer's trained representative for a period of four (4) hours to instruct the owners' designated personnel on the operation and maintenance of the entire system. An End-User Training Video shall be included as part of the system documentation.

A. Software Modifications

1. Provide the services of a qualified technician to perform all system software modifications, upgrades or changes. Response time of the technician to the site shall not exceed 4 hours.

2. Provide all hardware, software, programming tools and documentation necessary to modify the fire alarm system on site. Modification includes addition and deletion of devices, circuits, zones and changes to system operation and custom label changes for devices or zones. The system structure and software shall place no limit on the type or extent of software modifications on-site. Modification of software shall not require power-down of the system or loss of system fire protection while modifications are being made.

3.5 GUARANTY:

All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one year period shall be included in the submittal bid.

3.6. MAINTENANCE:

A. Maintenance and testing shall be on a semi-annual schedule or as required by the local AHJ. A preventive maintenance schedule shall be provided by the contractor describing the protocol for preventive maintenance. The schedule shall include:

1. Systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, waterflow switches and all accessories of the fire alarm system.

2. Each circuit in the fire alarm system shall be tested semiannually.

3. Each smoke detector shall be tested in accordance with the requirements of NFPA 72, Chapter 10.

B. As part of the bid/proposal, include a quote for a maintenance contract to provide all maintenance, tests, and repairs described below. Include also a quote for unscheduled maintenance/repairs, including hourly rates for technicians trained on this equipment and response travel costs for each year of the maintenance period.

Submittals that do not identify all post contract maintenance costs will not be accepted. Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty.

3.7 EQUIPMENT AND MATERIAL, GENERAL:

A. All equipment and components shall be new, and the manufacturer's current model. The materials,

appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a fire protective signaling system, meeting the National Fire Alarm Code.

B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

C. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

D. All equipment must be available "over the counter" through the Security Equipment Distributor (SED) market and can be installed by dealerships independent of the manufacturer.

3.8 CONDUIT AND WIRE:

A. Conduit:

1. Conduit shall be in accordance with The National Electrical Code (NEC), local and state requirements.

2. All wiring shall be installed in conduit or raceway. Conduit fill shall not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.

3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per NEC Article 760-29.

4. Wiring for 24 volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.

5. Conduit shall not enter the fire alarm control panel, or any other remotely mounted control panel equipment or backboxes, except where conduit entry is specified by the FACP manufacturer.

6. Conduit shall be 3/4 inch (19.1 mm) minimum.

B. Wire:

1. All fire alarm system wiring shall be new.

2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.

3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.

4. Wire and cable not installed in conduit shall have a fire resistance rating suitable for the installation as indicated in NEC 760 (e.g., FPLR).

5. Wiring used for the multiplex communication circuit (SLC) shall be twisted and support a minimum wiring distance of 10,000 feet when sized at 12 AWG. The design of the system shall

permit use of IDC and NAC wiring in the same conduit with the SLC communication circuit. Shielded wire shall not be required.

6. All field wiring (with exception of external communications Ethernet) shall be electrically supervised for open circuit and ground fault.

7. The fire alarm control panel shall be capable of T-tapping NFPA Style 4 (Class B) Signaling Line Circuits (SLCs). Systems which do not allow or have restrictions in, for example, the amount of T-taps, length of T-taps etc., is not acceptable.

C. Terminal Boxes, Junction Boxes and Cabinets:

All boxes and cabinets shall be UL listed for their use and purpose.

D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. Fire alarm control panel primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod. The control panel enclosure shall feature a quick removal chassis to facilitate rapid replacement of the FACP electronics.

END OF SECTION

SECTION 27 05 33 - CONDUITS AND BACKBOXES FOR COMMUNICATIONS SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes conduit and tubing, surface raceways, wireways, outlet boxes, pull and junction boxes, and handholes.

B. Related Sections:
1. Section 26 05 03 - Equipment Wiring Connections.
2. Section 26 05 33 - Raceway and Boxes for Electrical Systems.
3. Section 26 05 34 - Floor Boxes for Electrical Systems.
4. Section 26 27 26 - Wiring Devices.

1.2 REFERENCES

A. American National Standards Institute:
1. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.
2. ANSI C80.3 - Specification for Electrical Metallic Tubing, Zinc Coated.
3. ANSI C80.5 - Aluminum Rigid Conduit - (ARC).

B. National Electrical Manufacturers Association:
1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
2. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.
3. NEMA OS 1 - Sheet Steel Outlet Boxes, Device Boxes, Covers, and Box Supports.
4. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers, and Box Supports.
5. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.
6. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit.
7. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.3 SYSTEM DESCRIPTION

A. Raceway and boxes located as indicated on Drawings, and at other locations required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements. Raceway and boxes are shown in approximate locations unless dimensioned. Provide raceway to complete wiring system.

B. Concealed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

C. Exposed Dry Locations: Provide electrical metallic tubing. Provide sheet-metal boxes. Provide flush mounting outlet box in finished areas. Provide hinged enclosure for large pull boxes.

1.4 DESIGN REQUIREMENTS

A. Minimum Raceway Size: 3/4 inch unless otherwise specified.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit for the following:
   1. Flexible metal conduit.
   2. Liquidtight flexible metal conduit.
   3. Nonmetallic conduit.
   4. Flexible nonmetallic conduit.
   5. Nonmetallic tubing.
   6. Raceway fittings.
   7. Conduit bodies.
   8. Surface raceway.
   9. Wireway.
   10. Pull and junction boxes.
   11. Handholes.

C. Manufacturer's Installation Instructions: Submit application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents:

   1. Record actual routing of all conduits.
   2. Record actual locations and mounting heights of outlet, pull, and junction boxes.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

C. Protect PVC conduit from sunlight.

1.8 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate installation of outlet boxes for equipment connected under Section 26 05 03.

C. Coordinate mounting heights, orientation and locations of outlets mounted above counters, benches, and backsplashes.

PART 2 PRODUCTS

2.1 METAL CONDUIT

A. Manufacturers:
   1. Substitutions: Section 01 60 00 - Product Requirements.

B. Rigid Steel Conduit: ANSI C80.1.

C. Rigid Aluminum Conduit: ANSI C80.5.

D. Intermediate Metal Conduit (IMC): Rigid steel.

E. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.2 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
   1. Substitutions: Section 01 60 00 - Product Requirements.

B. Product Description: ANSI C80.3; galvanized tubing.

C. Fittings and Conduit Bodies: NEMA FB 1; steel , compression type.

2.3 OUTLET BOXES

A. Manufacturers:
   1. Substitutions: Section 01 60 00 - Product Requirements.

B. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
   1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; furnish 1/2 inch (13 mm) male fixture studs where required.
   2. Concrete Ceiling Boxes: Concrete type.

C. Nonmetallic Outlet Boxes: NEMA OS 2.

D. Cast Boxes: NEMA FB 1, Type FD, aluminum. Furnish gasketed cover by box manufacturer. Furnish threaded hubs.

E. Wall Plates for Finished Areas: As specified in Section 26 27 26.

F. Wall Plates for Unfinished Areas: Furnish gasketed cover.

2.4 PULL AND JUNCTION BOXES

A. Manufacturers:
   1. Substitutions: Section 01 60 00 - Product Requirements.

B. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify outlet locations and routing and termination locations of raceway prior to rough-in.

3.2 INSTALLATION

A. Ground and bond raceway and boxes in accordance with Section 26 05 26 .

B. Fasten raceway and box supports to structure and finishes in accordance with Section 26 05 29.

C. Identify raceway and boxes in accordance with Section 26 05 53.

D. Arrange raceway and boxes to maintain headroom and present neat appearance.

3.3 INSTALLATION - RACEWAY

A. Raceway routing is shown in approximate locations unless dimensioned. Route to complete wiring system.

B. Arrange raceway supports to prevent misalignment during wiring installation.

C. Support raceway using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

D. Group related raceway; support using conduit rack. Construct rack using steel channel specified in Section 26 05 29; provide space on each for 25 percent additional raceways.

E. Do not support raceway with wire or perforated pipe straps. Remove wire used for temporary supports

F. Do not attach raceway to ceiling support wires or other piping systems.

G. Construct wireway supports from steel channel specified in Section 26 05 29.

H. Route exposed raceway parallel and perpendicular to walls.

I. Route raceway installed above accessible ceilings parallel and perpendicular to walls.

J. Route conduit in and under slab from point-to-point.

K. Maintain clearance between raceway and piping for maintenance purposes.

L. Maintain 12 inch clearance between raceway and surfaces with temperatures exceeding 104 degrees F (40 degrees C).

M. Cut conduit square using saw or pipe cutter; de-burr cut ends.

N. Bring conduit to shoulder of fittings; fasten securely.

O. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for minimum 20 minutes.

P. Install conduit hubs to fasten conduit.

Q. Install no more than equivalent of three 90 degree bends between boxes. Install conduit bodies to make sharp changes in direction, as around beams.

R. Avoid moisture traps; install junction box with drain fitting at low points in conduit system.

S. Install fittings to accommodate expansion and deflection where raceway crosses expansion joints.

T. Install suitable pull string or cord in each empty raceway except sleeves and nipples.

U. Install suitable caps to protect installed conduit against entrance of dirt and moisture.

V. Surface Raceway: Install flat-head screws, clips, and straps to fasten raceway channel to surfaces; mount plumb and level. Install insulating bushings and inserts at connections to outlets and corner fittings.

W. Close ends and unused openings in wireway.

3.4 INSTALLATION - BOXES

A. Install wall mounted boxes at elevations to accommodate mounting heights as indicated on Drawings and specified in section for outlet device.

B. Adjust box location up to prior to rough-in to accommodate intended purpose.

C. Orient boxes to accommodate wiring devices oriented as specified in Section 26 27 26.

D. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

E. In Accessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150 mm) from ceiling access panel or from removable recessed luminaire.

F. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

G. Do not install flush mounting box back-to-back in walls; install with minimum 6 inches (150 mm) separation. Install with minimum 24 inches (600 mm) separation in acoustic rated walls.

H. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

I. Install stamped steel bridges to fasten flush mounting outlet box between studs.

J. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

K. Install adjustable steel channel fasteners for hung ceiling outlet box.

L. Do not fasten boxes to ceiling support wires or other piping systems.

M. Support boxes independently of conduit.

N. Install gang box where more than one device is mounted together. Do not use sectional box.

O. Install gang box with plaster ring for single device outlets.

3.5 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements.

B. Route conduit through roof openings for piping and ductwork or through suitable roof jack with pitch pocket. Coordinate location with roofing installation specified in Section

C. Locate outlet boxes to allow luminaires positioned as indicated on Drawings and reflected ceiling plan.

D. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

3.6 ADJUSTING

A. Section 01 70 00 - Execution and Closeout Requirements: Testing, adjusting, and balancing.

B. Adjust flush-mounting outlets to make front flush with finished wall material.

C. Install knockout closures in unused openings in boxes.

3.7 CLEANING

A. Section 01 70 00 - Execution and Closeout Requirements : Final cleaning.

B. Clean interior of boxes to remove dust, debris, and other material.

C. Clean exposed surfaces and restore finish.

END OF SECTION

DIVISION 32
EXTERIOR IMPROVEMENTS



SECTION 321123 - AGGREGATE BASE COURSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Aggregate base course.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

   1. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.

B. ASTM International:

   1. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
   2. ASTM D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
   3. ASTM D2922 - Standard Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   4. ASTM D2940 - Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports.
   5. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

1.3 SUBMITTALS

A. Section 013300 - Submittal Procedures: Requirements for submittals.

B. Materials Source: Submit name of aggregate materials suppliers.

1.4 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the Work.

PART 2 - PRODUCTS

2.1 AGGREGATE MATERIALS

A. Base Aggregate: ASTM D2940; graded type.

   1. Percent Passing per Sieve Size:
      a. 1-1/2 Inches:95 to 100.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Section 013000 - Administrative Requirements: Verification of existing conditions before starting work.

B. Verify compacted substrate is dry and ready to support paving and imposed loads.

C. Verify substrate has been inspected, gradients and elevations are correct.

3.2 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place fill on soft, muddy, or frozen surfaces.

3.3 AGGREGATE PLACEMENT

A. Spread aggregate over prepared substrate to total compacted thickness indicated on Drawings.

B. Roller compact aggregate to 95 percent maximum density.

C. Level and contour surfaces to elevations, profiles, and gradients indicated.

D. Add small quantities of fine aggregate to coarse aggregate when required to assist compaction.

E. Maintain optimum moisture content of fill materials to attain specified compaction density.

F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.4 TOLERANCES

A. Section 014000 - Quality Requirements: Tolerances.

B. Maximum Variation From Thickness: 1/4 inch.

3.5 COMPACTION

A. Compact materials to 98 percent of maximum density as determined from test strip, according to ASTM D2940.

END OF SECTION 321123