

Ouachita Parish Public Library

Main Branch Renovation

1000 Oliver Road Monroe, LA 71201

for the

OUACHITA PARISH POLICE JURY

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AUGUST 2024

ARCHITECT PROJECT #1963

PROJECT MANUAL - SPECIFICATIONS

Ouachita Parish Public Library

Main Branch Renovation

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NOTICE TO BIDDERS

SEALED BIDS will be received by the Ouachita Parish Police Jury in the Police Jury Meeting Room at 100 Bry Street, Monroe, Louisiana 71201, on or before two (2:00) PM, Tuesday, October 29, 2024 and that the same will be opened, read aloud and tabulated in the office of the Ouachita Parish Police Jury at two (2:00) o'clock PM, Tuesday, October 29, 2024 and submitted to the Ouachita Parish Police Jury at a scheduled meeting for the purpose of furnishing the following:

Ouachita Parish Public Library Main Branch Renovation

Complete Bidding Documents for this project are being distributed in electronic form on behalf of the Owner by Centerline BidConnect. They may be obtained without charge and without deposit from the Public Plan Room at www.centerlinebidconnect.com. Printed copies are not available from the Owner or 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: Centerline - Phone: 504-291-5738, Email: bidconnect@centerline.co.

LAND 3 ARCHITECT INC
1900 Stubbs Avenue, Suite A
Monroe, Louisiana 71201-5752

PH: 318 - 322 - 2694 - ext. 2
Bill@Land3.com

Electronic bids can be submitted at to www.bidnetdirect.com/ouachitaparishpolicejury prior to bid closing time. Contractors/Vendors do not pay to register, receive notifications, or submit solicitation responses. Please contact me if you have any questions.

There will be a MANDATORY Pre-Bid Conference at 10:00 AM on Friday October 18, 2024 at 10:00 AM 1000 Oliver Road, Monroe LA, 71201. Bids will be accepted only from the Contractors that attend this meeting.

All bids must be accompanied by bid security equal to five percent (5%) of the base bid and all alternates, and must be in the form of a certified check, cashier's check or bid bond written by a company licensed to do business in Louisiana, countersigned by a person who is under contract with the surety company or bond issuer as a licensed agent in this State and who is residing in this State. No Bid Bond indicating an obligation of less than five percent (5%) by any method is acceptable.

The Successful Bidder will be required to furnish a performance and payment bond written by a company licensed to do business in Louisiana, and shall be countersigned by a person who is contracted with the surety company or bond issuer as agent of the company or issuer, and who is licensed as an insurance agent in this State and who is residing in this State, in an amount equal to 100% of the contract amount.

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.

OUACHITA PARISH POLICE JURY

Publication Dates:
October 3, 2024
October 10, 2024
October 17, 2024

INSTRUCTION TO BIDDERS

ARTICLE 1 DEFINITIONS

- 1.01 The Bidding Documents include the following:
- Notice to Bidders or Advertisement for Bids
 - Instructions to Bidders
 - Bid Form
 - Project Conditions
 - General Conditions of the Contract for Construction, AIA Document 201, 2017
 - Supplementary Conditions
 - Contract between Owner and Contractor, AIA Document A101, 2017
 - Project Manual Specifications, Divisions 1-43 and dated on the cover of this manual.
 - Drawings: As listed on the Title Plan Sheet.
 - Addenda issued during the bid period and acknowledged in the Bid Form.
- 1.02 Bidder's Checklist: (Include these 3 items with your Bid)
1. Bid Form & Unit Cost Bid Form (if Unit Cost apply)
 2. Bid Bond or Certified Check
 3. Evidence of authorized Signature on Bid Form may be as follows:
 - a. Copy of Secretary of State Website page indicating Officer's name who signed the Bid Form.
 - b. Screenshot of the Secretary of State Website indicating Officer's name who signed the Bid Form.
 - c. Written Affidavit or authorization of signer on Bid Form from the legal entity.

Written evidence of the authority of the person signing the bid for public works shall be submitted at the time of bidding. The authority of the signature of the person submitting the bid shall be deemed sufficient and acceptable if any of the following conditions are met:

- (a) The signature on the bid is that of any corporate officer listed on the most current annual report on file with the secretary of state, or the signature on the bid is that of any member of a partnership, limited liability company, limited liability partnership, or other legal entity listed in the most current business records on file with the secretary of state.
- (b) The signature on the bid is that of an authorized representative as documented by the legal entity certifying the authority of the person.
- (c) The legal entity has filed in the appropriate records of the secretary of state of this state, an affidavit, resolution, or other acknowledged or authentic document indicating the names of all parties authorized to submit bids for public contracts. Such document on file with the secretary of state shall remain in effect and shall be binding upon the principal until specifically rescinded and canceled from the records of the office.

- 1.03 **NOTE:** Within 10-days of Bid date, the apparent low bidder shall provide the Owner the "Non-Collusion and "Non-Solicitation Affidavit", and the "Attestations" forms. Include any other forms required by the Owner. **DO NOT SUBMIT THESE DOCUMENTS AT THE TIME OF BIDDING.**

- 1.04 **Tax Status** - This project qualifies for Sales Tax Exemption. The Owner shall make the successful low bidder an agent of the Owner and exempt from paying state and local sales tax. See attached forms.
- 1.05 All definitions set forth in the General conditions of the Contract for Construction, AIA Document, A201, or in other Contract Documents are applicable to the Bidding Documents.
- 1.06 Addenda are written or graphic instruments issued by the Architect prior to the opening of bids which modify or interpret the bidding documents by additions, deletions, clarifications, corrections and prior approvals.
- 1.07 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 Bidding Documents.
- 1.08 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 for sums stated in Alternate Bids.
- 1.09 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added (as noted on Bid Form and Alternate Section 01 23 00 to the amount of the Base Bid if the corresponding change in project scope or materials or methods of construction described in the Bidding Documents is accepted.
- 1.10 A Bidder is one who submits a Bid for a prime contract with the Owner for the Work described in the proposed Contract Documents.
- 1.11 Sub-bidder is one who submits a bid to a Bidder for materials and/or labor for a portion of the Work.
- 1.12 Where the word "Architect" is used in any of the Documents, it shall refer to the Prime Designer of the project, and Architect, Engineer or Landscape Architect.
- 1.13 **MANDATORY PRE-BID REPRESENTATIVE**: When a Mandatory Pre Bid Meeting is required by the Bid Notice, The representatives of the General Contractor who attend the Mandatory Pre-Bid Meeting shall be employed or associated with the General Contractor at the time of meeting. Each person attending the meeting can only represent one General Contractor. The purpose of the meeting is for serious bidders to tour the building site with the architect and become familiar with the conditions as well as bidding procedures and to ask questions about the project. The representative of the General Contractor must be present for the entire meeting.
- 1.14 **MANDATORY PRE BID REQUIREMENT**: When a Mandatory Pre Bid Meeting or Conference is required by the Bid Notice, it may be waived prior to Bid Date if the Owner elects to do in accordance with the Bid Law. Primary reason is lack of attendance.
- 1.15 **Building Permit**. The Bidder will need to contact the Parish and or Town for the cost of the Building Permit to include in their Bid.

ARTICLE 2 **BIDDER'S REPRESENTATION**

- 2.01 Each Bidder by making his bid represents that:
- 2.1.1 He has read and understands the Bidding Documents and his Bid is made in accordance therewith.
- 2.1.2 He and his sub-contractors have visited the site and have familiarized himself with the existing conditions under which the Work is to be performed. He & his sub-

contractors/suppliers have read and understand all Sections under Division 1 General Requirements. He has toured the complete project site, interior and exterior and is familiar with its conditions.

- 2.1.3 His Bid is based upon the materials, systems and equipment described in the Bidding Documents as advertised and as modified by Addenda. Contractor shall not rely on any verbal instructions during bidding unless issued in written Addendum.
- 2.02 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 Contractor shall be responsible for determining that all of his Sub-bidders or prospective Subcontractors are duly licensed in accordance with law.

ARTICLE 3 **BIDDING DOCUMENTS**

3.01 Copies

- 3.1.1 Complete Bidding Documents for this project are available in electronic form from the Legal Source as selected by the Architect. Bidders must get their Bid Documents from www.centerlinebidconnect.com. Plans may be obtained without charge and without deposit from www.centerlinebidconnect.com. Printed copies are not available from the Architect but arrangements can be made to obtain them through most reprographic firms. Plan holders are responsible for all costs associated with obtaining and reproducing the Bidding Documents. All General questions about this procedure shall be directed to the office of the Architect.
- 3.1.2 Complete sets of Bidding Documents shall be used in preparing bids; neither the Owner nor the Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 3.1.3 The Owner or Architect in making the Bidding 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.

3.02 Interpretation or Correction of Bidding Documents

- 3.2.1 Bidders shall promptly notify the Architect of any ambiguity, inconsistency or error which they may discover upon examination of the Bidding Documents or of the site and local conditions.
- 3.2.2 Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to the Architect, reaching him at least seven (7) days prior to the date for receipt of bids.
- 3.2.3 Any interpretation, correction or change of the Bidding Documents shall be made by Addendum. Interpretations, corrections or changes of the Bidding Documents made in any other manner will not be binding, and bidders shall not rely upon such interpretations, corrections and changes.

3.03 Substitutions Prior to Bids

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

- 3.3.2 When in specifications or contract documents a particular brand, make of material, device or equipment is shown or specified, such brand, make of material, device, or equipment shall be regarded merely as a standard.
- 3.3.3 The name of a certain brand, make, manufacturer, or definite specifications is to denote the quality standard of the article desired, but does not restrict bidders to the specific brand, make, manufacturer or specification named. It is to set forth and convey to prospective bidders the general style, type character, and quality of article desired.
- 3.3.4 If a potential supplier wishes to submit for equal product approval prior to bids, he shall do so no later than 7 working days prior to the bid opening. This is the only way the contractor or supplier will have assurance that a different product is approved prior to bidding. Read & comply with Product Substitution Section 01 25 00.
- 3.3.5 If the Architect/Architect approves any proposed substitution prior to Bids, such approval shall be set forth in an Addendum at least 3 working days prior to the Bid opening.

3.04 Addenda

- 3.4.1 Addenda will be posted and made available over the internet from www.centerlinebidconnect.com to all who are registered plan holders at www.centerlinebidconnect.com. An entity may become a registered plan holder at the www.centerlinebidconnect.com website free of charge.
- 3.4.2 Copies of Addenda shall not be made available by any other means than by www.centerlinebidconnect.com in accordance with the La Public Bid Law.
- 3.4.3 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; however, if the necessity arises to issue and 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 7, but not more than 21 working days, without the requirement of re-advertising.
- 3.4.4 Each Bidder shall ascertain from the Architect prior to submitting his bid that he has received all Addenda issued, and he shall acknowledge their receipt on the Bid Form.

ARTICLE 4 BIDDING PROCEDURE

4.01 Form and Style of Bids

- 4.1.1 Bids shall be submitted on the forms provided by the Architect.
- 4.1.2. All blanks on the bid form shall be filled in by typewriter or manually in ink.
- 4.1.3 Where so indicated by the makeup of the bid form, sums shall be expressed in both words and figures, and in case of discrepancy between the two, the written words shall govern.
- 4.1.4 Any interlineations, alteration or erasure must be initialed by the signer of the Bid or his authorized representative.
- 4.1.5 Bidders are cautioned to complete all alternates should such be required in the Bid

Form. Failure to submit alternate prices shall render the Proposal incomplete and shall reject entire bid.

- 4.1.6 Bidder shall make no additional stipulation on the bid form nor qualify his bid in any other manner.
- 4.1.7 The Bid shall include the legal name of Bidder and statement whether Bidder is a sole proprietor, a partnership, a corporation, or any other legal entity, and the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A bid submitted by an agency shall have a current Power of Attorney attached certifying agent's authority to Bind Bidder.
- 4.1.8 On any bid in excess of fifty thousand dollars (\$50,000), the Contractor shall certify that he is licensed under R.S. 37:2150-2163 and show his license number on the bid above his signature of his duly authorized representative.

4.02 Bid Security

- 4.2.1 No bid shall be considered or accepted unless the bid is accompanied by bid security in the amount of not less than five percent (5%) of the Base Bid and all additive 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 on the standard form used by a surety company licensed to do business in Louisiana, countersigned by a person who is under contract with the surety company or bond issuer as a licensed agent in this state and who is residing in this state and accompanied by appropriate power of attorney and in favor of the Owner.

Bid security furnished by the Contractor shall guarantee that the Contractor 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 Contract 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.

- 4.2.2 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.

4.03 Submission of Bids

Bids shall be submitted to and opened in accordance with the Advertisement for Bids or Notice to Bidders.

- 4.3.1 Bids shall be sealed in an opaque envelope 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 the address listed on the Advertisement for Bids or Notice to Bidders. Late delivery of a bid for any reason, including late delivery by United States Mail, or express delivery shall disqualify the bid. 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.

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 the address listed on the Advertisement for Bids or Notice to Bidders.

- 4.3.2 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.

- 4.3.3 Bidder shall assume full responsibility for timely delivery at located designated for receipt of Bids.
 - 4.3.4 Oral, telephonic or telegraphic Bids or modifications to bids are invalid and will not receive consideration. Owner will not consider notations written on outside of Bid Envelope which have the effect of amending the Bid.
- 4.04 Modification or Withdrawal of Bid
- 4.4.1 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 Act III of 1983 which states, in part, "Bids containing patently obvious mechanical, clerical or mathematical error 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 (48) hours of the bid opening excluding Saturdays, Sundays and legal holidays."
 - 4.4.2 Prior to the time and date designated for receipt of Bids, Bids submitted early may modified or withdrawn only by notice to the party receiving Bids at the place and prior to the time designated for receipt of Bids.
 - 4.4.3 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 Instruction to Bidders.
 - 4.4.4 Bid Security shall be in an amount sufficient for the Bid as modified or resubmitted.

ARTICLE 5 **CONSIDERATION OF BIDS**

- 5.01 Opening of Bids
- 5.1.1 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.
- 5.02 Rejection of Bids
- 5.2.1 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 Bidding Documents or a Bid in any way incomplete or irregular.
- 5.03 Acceptance of Bid
- 5.3.1 The Owner reserves the right to reject any and all bids.
 - 5.3.2 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.
 - 5.3.3 It is the intent of the Owner to award a contract to the lowest responsible Bidder in accordance with the requirements of the Bidding Documents, and if the bid does not exceed the funds available.
 - 5.3.4 The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work. The Contractor and Sub-Contractors

shall complete a Standardized AIA A-305 Contractor Qualification Statement if requested.

ARTICLE 6 POST-BID INFORMATION

6.01 Submissions

- 6.1.1 At the pre-construction conference, the Contractor shall submit the following information to the Architect.
- 6.1.1.1 A designation of the Work to be performed by the Contractor with his own forces.
- 6.1.1.2 A breakdown of the contract cost into the 16 Divisions of the C.S.I. No payments will be made to the Contractor until this is received. The proprietary names and the suppliers of principal items or systems of material and equipment proposed for the Work.
- 6.1.1.3 A list of names of all Subcontractors 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. **This list shall be required no later than three (10) business days after receipt of bids, if requested by Architect.**
- 6.1.2 The Contractor will be required to establish to the satisfaction of the Architect and the Owner the reliability and responsibility of the proposed Sub-Contractors to furnish and perform the Work described in the Sections of the Specifications pertaining to such proposed Sub-Contractor's respective trades.
- 6.1.3 The Architect shall notify the Contractor if either the Owner or the Architect, after due investigation, has reasonable and the substantial objection to any person or organization on the Contractor's list of proposed Subcontractors. If there are objections, the Contractor shall submit the name of alternative Subcontractor(s) for their approval.
- 6.1.4 Sub-Contractors and other persons and organizations proposed by the Bidder and accepted by the Owner and the Architect must be used on the Work for which they were proposed and accepted and shall not be changed except with the written approval of the Owner and the Architect.
- 6.1.5 The Owner or Architect may request the Contractor's Qualification Statement for consideration.

ARTICLE 7 PERFORMANCE AND PAYMENT BOND

7.01 Bond Required

- 7.1.1 The Contractor shall furnish and pay for a performance and payment bond written by a company licensed to do business in Louisiana 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 policyholders' surplus as shown in the latest A. M. Best's 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 and countersigned by a person who is under contract with surety as a licensed agent in this State, and who is residing in this State.

7.02 Time of Delivery and Form of Bond

7.2.1 The Bidder shall deliver the required bond to the Owner simultaneous with the execution of the Contract.

7.2.2 The Bidder 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 8

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

8.01 Form to be used

8.1.1 Form of the contract to be used shall be Standard Form of Agreement Between Owner and Contractor, AIA Document A101-2007. It shall be modified to include excerpts and requirements from the Project Manual and Addenda.

8.02 Award

8.2.1 Before award of the contract, the successful bidder shall furnish to the Owner a certified copy of the minutes of the corporation or partnership meeting which authorized the party executing the bid to sign on behalf of the Contractor.

ARTICLE 9

COMPLETION TIME AND LIQUIDATED DAMAGES

9.01 The completion of the Contract must be within the time stated in Supplementary Conditions, Article 8 subject to such extensions as may be granted under Paragraph 8.3, "Delays and Extensions of Time in the General Conditions and the Supplementary Conditions, or the Contractor shall be subject to pay to the Owner Liquidated Damages.

ARTICLE 10

PRE-BID CONFERENCE

10.01 A pre-bid conference shall be held at the project site at least seven (7) days before the date for receipt for bids. The Architect shall coordinate the setting of the date, time and place for the pre-bid conference with the Owner and shall invite in writing all who have received sets of the Bidding 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 Contract Documents, and to receive comments and information from interested Bidders.

10.02 Any revisions of the Bidding Documents made as a result of the pre-bid conference shall not be valid unless included in an Addendum.

ARTICLE 11

INDEMNIFICATION

11.01 The **Contractor** will indemnify and hold harmless the **Owner** and the **Architect** and their agents and employees from and against all claims, damages, losses, and expenses including attorney's fees arising out of or resulting from the performance of the work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting there from; and is caused in whole or part by any negligent or willful

act or omission of the **Contractor**, and **Subcontractor**, anyone directly or indirectly employed by anyone for whose acts any of them may be liable.

It is specifically declared and recognized by the parties that the **Owner** is the statutory employer for all purposes; and it is further specifically recognized by the parties that all work being performed under the contract herein, or any ancillary contracts entered into by the **Contractor** in furtherance of this project is part of the **Owner's** business, occupation or trade.

END

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: OUACHITA PARISH POLICE JURY
100 BRY STREET
MONROE, LOUISIANA 71201

BID FOR: OUACHITA PARISH PUBLIC LIBRARY – MAIN BRANCH RENOVATION
 1000 OLIVER ROAD
 MONROE, LA

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: Land 3 Architect Inc. and dated: August 2024.

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 (Additional Cost of Work per Section 01 23 00) for the lump sum of:

_____ Dollars (\$ _____)

Alternate No. 2 (Additional Cost of Work per Section 01 23 00) for the lump sum of:

_____ Dollars (\$ _____)

Alternate No. 3 (Additional Cost of Work per Section 01 23 00) for the lump sum of:

_____ Dollars (\$ _____)

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 IF THE BID AMOUNT EXCEEDS \$250,000:

* 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.

LOUISIANA UNIFORM PUBLIC WORK BID FORM

TO: OUACHITA PARISH POLICE JURY
100 BRY STREET
MONROE, LOUISIANA 71201

BID FOR: OUACHITA PARISH PUBLIC LIBRARY MAIN BRANCH RENOVATION
1000 OLIVER ROAD
MONROE, LA

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

DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
Fill Dirt				
UC - 1	1000	Cubic Yards		
Asphalt Paving Patch				
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
REF. NO.	QUANTITY:			
UC - 2	500	Square Feet		
Roof Deck				
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
REF. NO.	QUANTITY:			
UC - 3	500	Square Feet		
Roof Repair				
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
REF. NO.	QUANTITY:			
UC - 4	1000	Square Feet		
Roof Membrane				
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
REF. NO.	QUANTITY:			
UC - 5	1000	Square Feet		
Ceiling Grid				
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
REF. NO.	QUANTITY:			
UC - 6	2000	Square Feet		
Slab Patch				
DESCRIPTION:	<input checked="" type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
REF. NO.	QUANTITY:			
UC - 7	200	Linear Feet		
Not Used				
DESCRIPTION:	<input type="checkbox"/> Base Bid or <input type="checkbox"/> Alt.# ____	UNIT OF MEASURE:	UNIT PRICE	UNIT PRICE EXTENSION (Quantity times Unit Price)
REF. NO.	QUANTITY:			
Not Used				

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

SECTION 00 00 06 - UNIT PRICE (Cost) INSTRUCTIONS

The contractor shall include the Louisiana Uniform Public Work Unit Price Form with his Bid for the following unit cost items:

UC-1 Fill Dirt- Removal & replacement of 1 Cubic Yard of unacceptable soils with imported select fill as described in Section 31 00 00 Earthwork & Drainage including haul off and compaction. This is above & beyond that already indicated in the Bid Documents. Include in Unit Price Bid cost of 1 cubic yard and 1000 cubic yards.

UC-2 Asphalt Paving Patch – removal of existing asphalt materials by Section 32 12 13 and replacement per Detail N/SP2.1. Include in Bid 1 square foot of patch and 500 Square Feet in Bid. This is above & beyond that already indicated in the Bid Documents.

UC-3 Roof Deck - Removal of existing metal roof deck and installation of new 22 ga. Galv. Roof deck with equal thickness of rigid insulation (3 ½" thickness) by Section 07 52 00 per Detail D/R1.1. Include in Unit Price Bid the cost one 1 square feet and a total of 1000 SF.

UC-4 Roof Repair – Removal of existing roof membrane/substrate material and install new membrane roofing/insulation per Roof Repair Detail C/R1.1 Include in Unit Price Bid the cost one 1 square feet and a total of 1000 SF.

UC-5 Roof Membrane – Removal of existing roof membrane and install new membrane roofing per Detail B/R1.1 Include in Unit Price Bid the cost one 1 square feet and a total of 1000 SF. This is above & beyond that already indicated in the Bid Documents.

UC-6 Ceiling Grid – Removal & replacement of existing 15/16" white ceiling grid by Section 09 51 13. Include unit cost of 1 Square foot of grid and 2000 Square Feet of grid in Bid. This is above & beyond that already indicated in the Bid Documents.

UC-7 Sawcut & Slab Patch – Removal & replacement of 12" width of existing slab/sub-surface materials per Detail K/A5.3 Include cost of 1 Linear foot and 200 Linear Feet in Bid. This is above & beyond that already indicated in the Bid Documents.

Include the total cost of all items on the UNIT PRICE FORM in your Bid.

Unit Price items must constitute full compensation for furnishing all labor, labor burden, material, equipment, insurance, applicable taxes, overhead and profit; performing any associated contractor quality control, environmental protection, meeting safety requirements, tests and reports and for performing all work required for each of the Unit Price items.

NOTE: The Unit Cost provided will be used for additional removal and replacement of materials not already indicated in the Bid Documents. Unused portions of the unit price extension shall be credited to the Owner in the form of a Change Order.

SALES TAX EXEMPTION FORM

NO SALES TAX: The Owner is exempt from State and Local Sales Tax. Prepare Bid Proposals accordingly. The Owner is a tax-exempt entity. Contractors and sub-contractors are expected to purchase materials as agents of the Owner and comply with all requirements for maintaining tax free status. **All contractors and sub-contractors should calculate their bids on a tax-free basis and will bear the loss should they fail to comply with the law concerning tax-free entities.**

The following form shall be executed by the Owner and Contractors after project is awarded.

The General Contractor shall be responsible for downloading and completing all of the most recent forms necessary and submitting to the Architect for signing by the Owner.

Included is the R-1020 Form by the Louisiana Department of Revenue designating the Contractor as Agent of a Government entity and Exemption Certificate.

END OF PAGE



**Designation of Construction Contractor
as Agent of a Governmental Entity
Sales Tax Exemption Certificate**

_____, an agency of the United States government, or an agency, board, commission, or instrumentality of the State of Louisiana or its political subdivisions, including parishes, municipalities and school boards, does hereby designate the following contractor as its agent for the purpose of making sales tax exempt purchases on behalf of the governmental body:

Name of Contractor		
Address		
City	State	ZIP

This designation of agency shall be effective for purchases of component construction materials, taxable services and leases and rentals of tangible personal property for the following named construction project:

Construction Project	Contract Number
----------------------	-----------------

This designation and acceptance of agency is effective for the period

Beginning Date (mm/dd/yyyy)	End Date (mm/dd/yyyy)
-----------------------------	-----------------------

Purchases for the named project during this period by the designated contractor shall be considered as the legal equivalent of purchases directly by the governmental body. Any materials purchased by this agent shall immediately, upon the vendor's delivery to the agent, become the property of this government entity. This government entity, as principal, assumes direct liability to the vendor for the payment of any property, services, leases, or rentals made by this designated agent. This agreement does not void or supersede the obligations of any party created under any construction contract related to this project, including specifically any contractual obligation of the construction contractor to submit payment to the vendors of materials or services for the project.

This contractor-agent is not authorized to delegate this purchasing agency to others; separate designations of agency by this governmental entity are required for each contractor or sub-contractor who is to purchase on behalf of this governmental entity. The undersigned hereby certify that this designation is the entirety of the agency designation agreement between them. In order for a purchase for an eligible governmental entity through a designated agent to be eligible for sales tax exemption, the designation of agency must be made, accepted, and disclosed to the vendor before or at the time of the purchase transaction.

Designation of Agency		
Signature of Authorized Designator	Date (mm/dd/yyyy)	
Name of Authorized Designator		
Name of Governmental Entity		
Address		
City	State	ZIP

Acceptance of Agency		
Signature of Contractor or Subcontractor Authorized Acceptor	Date (mm/dd/yyyy)	
Name of Contractor's or Subcontractor's Acceptor		
Name of Contractor		
Address		
City	State	ZIP

This designation of agency form, when properly executed by both the contractor and the governmental entity, shall serve as evidence of the sales tax exempt status that has been conferred onto the contractor. No other exemption certificate form is necessary to claim exemption from sales taxes. The agency agreement evidenced by this sales tax exemption certificate must be implemented at the time of contract execution with the governmental entity. The contract between the governmental entity and his agent must contain provisions to authenticate the conferment of agency.

BID BOND

Date: _____

KNOW ALL MEN BY THESE PRESENTS:

That _____ of _____, as Principal, and _____, as Surety, are held and firmly bound unto the _____ (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: _____
AUTHORIZED OFFICER-OWNER-PARTNER

BY: _____
AGENT OR ATTORNEY-IN-FACT(SEAL)

ATTESTATIONS

Appearer, as a Bidder on the above-entitled Public Works project, does hereby attest that:

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

C. 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. 14:23)

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 of 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
- (i) Malfeasance in office (R.S. 14:134)

LA. R.S. 38:2212.10 **VERIFICATION OF EMPLOYEES**

C. (1) Appearer is registered and participates in a status verification system to verify that all new employees in the state of Louisiana are legal citizens of the United States or are legal aliens.

(2) 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.

(3) In accordance with state statute LSA-R.S. 38:2212.10(D) (1), Appearer acknowledges and understands that violating the verification requirements imposed by law may serve as a basis for cancellation of the contract with the **Ouachita Parish Policy Jury** and may result in ineligibility to engage in any public contracting for a period of not more than three years from the date a violation is discovered. In addition, Appearer shall be liable for any additional cost incurred by the **Ouachita Parish Police Jury**, occasioned by the cancellation of the contract or loss of the

appearer's contractor's license or permit to do business in the state under the law.

_____ Name of
Bidder Name of Authorized Representative of Bidder

_____ Title of Authorized Representative

SWORN TO AND SUBSCRIBED before me, the undersigned notary public, on this _____ Day of
_____ 20 _____ in _____ Louisiana, after a reading of this whole.

_____ Notary Public (Print Name : _____) Notary
Identification No. _____

NON-COLLUSIVE AND NON-SOLICITATION AFFIDAVIT

State of Louisiana, Parish of Ouachita

_____, being first duly sworn,
(Name of Authorized Representative of Bidder)

deposes and says that:

(1) He is the _____ of
(Owner, Partner, Officer, Representative or Agent)

_____, the Bidder, and that
(Name of Bidder)

the Bidder has submitted the accompanying Bid for the construction of above Contract, a public project of the Ouachita Parish Police Jury, Monroe Louisiana;

- (2) He is fully informed respecting the preparation and contents of the Bid and of all pertinent circumstances respecting the Bid;
- (3) The Bid is genuine and is not a collusive or sham Bid;
- (4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, have in any way colluded, conspired, connived or agreed, directly or indirectly, with any other Bidder firm or person to submit a collusive or sham Bid in connection with the Contract or Work for which the attached Bid has been submitted; or to refrain from bidding in connection with such Work; or have any manner, directly or indirectly, south by agreement, collusion, communication or conference with any Bidder, firm or person to fix the price or prices in the Bid or the Bid price of any other Bidder; or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Owner, or any person interested in the proposed Work;
- (5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any other of its agents, representatives, owners, employees or parties in interest, including this affidavit; and
- (6) That he has employed no one person, corporation, firm, association or other organization, either directly or indirectly, to secure the public contract under which he is to receive payment, other than persons regularly employed by him whose services in connection with the construction of the public building or project or in securing the public contract were in the regular course of their duties for him; and that no part of the contract price to be received by him 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 him whose services in connection with the construction of the public building or project were in the regular course of their duties for him.
- (7) This affidavit is executed in compliance with the provisions of Louisiana Revised Statutes 38:2219

Bidder _____

By _____

Title _____

Subscribed and sworn to before me

This _____ day of _____, 20 _____ at _____.

My commission expires _____.

SEAL

Apparent Low Bidder shall submit to Owner within 10 days of Bid opening.

AIA[®] Document A201[™] – 2017

General Conditions of the Contract for Construction

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

REFER TO COVER PAGE OF PROJECT MANUAL

THE OWNER:
(Name, legal status and address)

REFER TO COVER PAGE OF PROJECT MANUAL

THE ARCHITECT:
(Name, legal status and address)

Land 3 Architect Inc., APC - William A. Land
1900 Stubbs Ave
Monroe, LA 71201

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- 14 TERMINATION OR SUSPENSION OF THE CONTRACT
- 15 CLAIMS AND DISPUTES

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

For guidance in modifying this document to include supplementary conditions, see AIA Document A503[™], Guide for Supplementary Conditions.

Init.

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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 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

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and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

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

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§ 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 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

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such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from 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 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;

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- 2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- 3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (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.

§ 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,

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compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

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

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

§ 4.2 Administration of the Contract

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

§ 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

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other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

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

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

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

§ 4.2.11 The Architect will 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 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.

§ 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

§ 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.

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

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

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

§ 7.4 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.

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§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

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

§ 9.2 Schedule of Values

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

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(3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, 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.

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

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

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

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

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

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

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, 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 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, 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.

§ 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.

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

§ 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 mortgage 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

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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.

§ 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

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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 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:

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- .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;
- .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.

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§ 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

- .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 based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand

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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.

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”.

1.8 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”.

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

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.

3.9 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

- 3.10.3 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: 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 21 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 21 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:

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

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 are 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.

Supervision shall not be included as a line item in the "Cost of the Work".

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 10% 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, except credit will not be required for Overhead and Profit. Where a change results in both credits to the Owner and extras to the Contractor for related items, overhead and profit shall only be computed on the net extra cost to the Contractor.

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; 15% markup on the Cost of the Work.

7.2.4.2 When the Work is all Subcontract Work; 15% markup on the Cost of the Work for Subcontractor's Overhead and Profit, plus 10% 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. This cost is already included in the percentage markup of the Cost of the Work..

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:

It shall be mutually agreed by the Contractor and the Owner that time is an essential part of the Contract and in case of the Contractor’s failure to complete **Phase 1** of the Project within **Four Hundred (400) Calendar Days** agreed upon, the Owner will be damaged thereby; and because it is difficult to definitely ascertain and approve the amount of said damages, it is hereby agreed that the amount of Liquidated Damages shall be the sum of **Five Hundred and 00/100 dollars (\$ 500.00)** for each consecutive calendar day of delay for which each Phase of the Project that the Work is not Substantially Complete beginning with the first day beyond the completion times stated above. Contractor agrees to pay as Liquidated Damages, the sum of **Two Hundred and no/100 dollars (\$200.00)** for each consecutive calendar day for which any item on the list of items to be corrected or completed (punch list) is not complete or correct beginning with the forty-sixth (46th) day after the dates(s) of substantial completion for each phase of the Project. Contractor agrees that said sum(s) shall be deducted from monies due Contractor by Constructive Change Directive *or if no money* is due Contractor, the Contractor agrees to pay Owner as Liquidated Damages as not by way of penalty such sum as shall be due for each period of delay. 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 above. Such Liquidated Damages shall be withheld by the Owner from the amounts due the Contractor for progress payments.

Delete Section 8.2.2.

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 an Application & Certificate for Payment on the AIA Document G702-1992, accompanied by AIA Document G703-1992, and supported by any additional data substantiating the Contractor's right to payment as the Owner or the Architect may require. 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 Payment may not 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.

9.4 CERTIFICATES OF PAYMENT

Section 9.4.1(2) Add the following: (4) Architect may require the Contractor to revise corrected Payment Application and re-submit to Architect.

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 Certificate of Substantial Completion that shall establish the date 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 Contractor shall file the Certificate at the Parish Clerk of Court in which the Work is performed.
- 9.8.6 Warranties required by the Contract Documents shall commence on the date of Substantial Completion 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 impose the Liquidated Damages of Section 8.2.1 or 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

- 9.10.1 After the second sentence, add the following:

If the Architect does not find the Work acceptable under the Contract Documents, the Architect shall make one additional inspection; if the Work is still not acceptable, the Architect, and each of the Architect's principal consultants, shall be paid \$175.00/hour for their time at the project site, for each additional inspection, to be withheld from the unpaid funds remaining in the Contract sum. The payment shall be made by the Owner and deducted from the construction contract funds.

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 REQUIRED

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 each project. 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

<u>Type of Construction</u>	<u>Projects up to \$1,000,000</u>	<u>Projects over \$1,000,000 up to \$10,000,000</u>	<u>Projects over \$10,000,000</u>
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 \$_____.		
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 Deleted

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 Owner's self-insurance or commercial property policy,

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:

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 Owner, 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 Owner, 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 Owner, 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 Owner, all 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 Owner, 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. Owner 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.

13.4 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”.

Add Section 15.1.6.3:

15.1.6.3 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. Only Precipitation greater than .01” shall be considered an adverse weather day. 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	<u>11</u> days	July	<u>6</u> days
February	<u>10</u> days	August	<u>5</u> days
March	<u>8</u> days	September	<u>4</u> days
April	<u>7</u> days	October	<u>3</u> days
May	<u>5</u> days	November	<u>5</u> days
June	<u>6</u> days	December	<u>8</u> 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.

Since 80% of the work is interior, no additional contract days shall be given for weather.

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.”

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

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,”.

OWNER AND CONTRACTOR AGREEMENT

The 2017 Edition of the AIA Document A-101 Standard Form of Agreement Between Owner and Contractor where the basis of payment is a STIPULATED SUM as published by the American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C. shall be used as the Agreement between the Owner and Contractor and is hereby specifically made a part of the Contract Documents.

A copy of AIA Document A-101 Standard Form of Agreement Between Owner and Contractor where the basis of payment is a STIPULATED SUM is attached.

The Agreement shall be modified to include excerpts and requirements from the Project Manual and Addenda.

The Contractor shall file this Agreement and the Performance and Payment Bonds with the Clerk of Court for the Parish of the Project location within five (5) business days of the signing of this Agreement.

Change Sub Article 5.3 to read: Payments due and unpaid under the Contract shall bear no interest from the date payment is due.

END



AIA[®] Document A101[™] – 2017

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

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

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

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

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

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

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

The parties should complete A101[™]-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement.

AIA Document A201[™]-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

The Owner and Contractor agree as follows.

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

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

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

- Not later than () calendar days from the date of commencement of the Work.

Init.

By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
-----------------	-----------------------------

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

ARTICLE 4 CONTRACT SUM

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

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
------	-------

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. (Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
------	-------	---------------------------

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

Item	Price
------	-------

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

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

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

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

Init.

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the _____ day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the _____ day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than () days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

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

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

§ 5.1.6 In accordance with AIA Document A201™-2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

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

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

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

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

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

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

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

§ 5.2 Final Payment

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

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

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

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

_____ %

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

- Arbitration pursuant to Section 15.4 of AIA Document A201–2017
- Litigation in a court of competent jurisdiction
- Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

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

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

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

ARTICLE 8 MISCELLANEOUS PROVISIONS

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

§ 8.2 The Owner’s representative:
(Name, address, email address, and other information)

§ 8.3 The Contractor’s representative:
(Name, address, email address, and other information)

§ 8.4 Neither the Owner’s nor the Contractor’s representative shall be changed without ten days’ prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™-2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201-2017, may be given in accordance with AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203-2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™-2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™-2017, General Conditions of the Contract for Construction
- .4 AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013 incorporated into this Agreement.)

.5 Drawings

Number	Title	Date
--------	-------	------

.6 Specifications

Section	Title	Date	Pages
---------	-------	------	-------

.7 Addenda, if any:

Number	Date	Pages
--------	------	-------

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

.8 Other Exhibits:

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

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

(Insert the date of the E204-2017 incorporated into this Agreement.)

The Sustainability Plan:

Title	Date	Pages
-------	------	-------

Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
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.9 Other documents, if any, listed below:

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

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

OWNER (Signature)

CONTRACTOR (Signature)

(Printed name and title)

(Printed name and title)

SECTION 01 10 00 – WORK SUMMARY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. WORK REQUIREMENTS:
 - 1. Project Identification
 - 2. Work Summary covered by Contract Documents
 - 3. Work Restrictions
 - 4. Building Permit
 - 5. Existing Visible Conditions
 - 6. Review of Bid Documents
 - 7. Printing of Contract Documents
 - 9. English Speaking Superintendent & Trade Foremen.
 - 10. Insurance Requirements
 - 11. Time of Completion and Liquidated Damages
 - 12. Existing Building Operation

1.3 PROJECT INFORMATION

- A.
 - 1. Project Location: 1000 Oliver Road, Monroe, LA.
 - 2. Owner: Ouachita Parish Police Jury
 - 3. User Agency: Ouachita Parish Public Library
- B. Architect Identification: The Contract Documents, were prepared for this Project by Land 3 Architect Inc., 1900 Stubbs Avenue, Suite A, Monroe Louisiana, 71201-5751. Architect of Record is William A. "Bill" Land.
- C. Work Summary: The Work is defined by the Contract Documents and consists of a complete replacement of the existing fire alarm system and related materials.

The Work shall be constructed under a single prime contract under a single phase.

It is imperative that bidders carefully and fully study the Contract Documents prior to the Bid Date. Bidders should also familiarize themselves with the Instructions to Bidders, Product Substitution Requirements, User Agency provided Work & Materials.

1.4 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with User Agency restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work on the project to construction working hours of 7:00a.m. to 7:00p.m., Monday through Sunday, unless otherwise approved by the User Agency or limited by local noise ordinance.
- C. ~~Existing Utility Interruptions: Do not interrupt utilities (including air conditioning & data) serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:~~
 - ~~1. Notify User Agency not less than five days in advance of proposed utility interruptions.~~
 - ~~2. Obtain User Agency's written permission before proceeding with utility interruptions.~~
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to User Agency occupancy with Owner.
 - 1. Notify Architect & User Agency not less than five days in advance of proposed disruptive operations.
 - 2. Obtain User Agency's written permission before proceeding with disruptive operations.

- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes.
- F. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- G. Weapons: Guns of any kind on Project site is not permitted.
- H. Employee Screening: Comply with User Agency requirements for drug and background screening of Contractor personnel working on Project site.

1.5 BUILDING PERMIT

- A. General Building Permit is required by the **the City of Monroe**
- B. It is the Contractor's responsibility to become familiar with the permit and inspection requirements mandated by the various Governmental agencies. Other permits & fees shall apply. Be sure to check with the Parish to learn of any permit cost.

1.07 REVIEW OF BID DOCUMENTS (Applies to All Plan Sheets and All Specification Sections)

- A. Drawings indicate the General Scope of the Project in Terms of Architectural Design Intent, many drawings are diagrammatic and every minute detail is not indicated. The sub-contractor shall be experienced with his trade and furnish all items drawn or specified as necessary for the completion of the work as indicated.
- B. General Contractor Review of Bid Documents: The General Contractor shall carefully review all of the plans & Project Manual Prior to Bids. Reliance on subcontractors & suppliers to include all the work indicated in the Bid Documents in their Bid is the General Contractor's prerogative. The Owner shall not pay for changes that would have been avoided if the General Contractor reviewed all specification sections and drawings and advised the appropriate subcontractors of exclusions and inclusions prior to Bids. If the General Contractor has any or questions concerns about the plans or specifications, he shall comply with Sections 01 42 00 & 01 45 00 and notify the Architect prior to bids. E-mail: Bill@LAND3.com .

1.08 PRINTING OF CONTRACT DOCUMENTS

- A. General Contractor shall be responsible for printing of all Contract Documents.

1.09 ENGLISH SPEAKING SUPERINTENDANT & TRADE FOREMEN

- A. General Contractor shall employ a FULL TIME Job Superintendent that speaks & writes fluent English. Each Trade shall have a foreman or translator on the jobsite at all times who speaks & writes fluent English.

1.10 INSURANCE REQUIREMENTS

- A. See General & Supplementary Conditions including Article 11. Builder's Risk Insurance shall be provided by the General Contractor.

1.11 TIME OF COMPLETION

- A. Refer to Supplementary Conditions Article 8.

1.12 EXISTING BUILDING OPERATION: The existing building and premises is vacant.

1.13 TEMPORARY FACILITIES: Refer to Section 01 50 00.

END OF SECTION

Section 01 14 00 – 2021 International Energy Conservation Code Compliance

This Project shall comply with **2021 International Energy Conservation Code** for each Building. The General Contractor, Plumbing Contractor, Mechanical Contractor and Electrical Contractor shall be required to be knowledgeable of this code and shall include cost in their Bid for full compliance with the following items which may be less stringent than Energy Star:

State of Louisiana Insulation Certificate shall be completed by builder and attached to inside of furnace closet or other area designated by the code official.

COMMERCIAL BUILDINGS

C 401.3 **Thermal Envelope Certificate** – not required for existing building.

C402.4 – **Building Fenestration Table** – Use this Table for minimum glazing values unless the plans or specifications indicate a more efficient value.

C 402.5.1 - **Air Barriers**: Continuous air barrier is required throughout the thermal envelope.

See 402.5.4: **Air Leakage of Fenestration** - air leakage of fenestration assemblies must meet provisions of table C 402.5.4.

C 402.5.10: **Recessed Lighting** in attics shall be ICC rated, labeled as having air leakage of 2.0 CFM or less, sealed with gasket or caulk.

C 403.1.1: **Calculation of Heating and Cooling Loads**. HVAC design loads must be determined in accordance with ANS I/ ASHRAE/ACCA standard 183 or equivalent, output capacity of HVAC equipment must be less than that of the smallest available equipment size that exceeds the loads calculated parentheses C 403.3.1

C 403.3.2: **HVAC equipment performance requirements**. Equipment must meet the minimum efficiency requirements of tables C 403.3.2(1) – 16

C 403.4 **Heating and cooling system controls**: C 403.4.1 each zone must be controlled by individual thermostatic controls. Thermostats for heat pumps must be type that prevent supplementary heat from coming on when the heating requirements can be met by th the heat pump alone. A two stage thermostats with setpoints that control the supplementary heat on the 2nd stage(lower setpoint) and compression heating on the first stage(higher setpoint), in conjunction with an outdoor air lockout, meets this requirement.

C 404.6.1 **Water Heater Circulator Line & motorized Pump** is required unless point of use water heaters are indicated.

C 405.2.1 1: **Occupant Sensor Control Function**, required in most spaces except corridors, large open rooms, kitchens (spaces where automatic shutoff would endanger occupant safety or security). These automatically turn off lights within 20 minutes after all occupants have left the space, manual turn on the lighting each area not provided with the occupant center controls must have time switch controls. See Plans for Performance Requirements.

C 407: **Total Building Performance**

C 407.2 Mandatory Requirements must meet requirements of table C 407.2. Must have an annual energy cost less than or equal to 80% of the standard reference design.

C 407.3 **Documentation**. Documentation verifying that the methods and accuracy of compliance software tools conform to provisions of this section must be provided to the code official compliance report shall include address of the building, inspection checklist, name of individual completing the compliance report & name and version of software tool

C 408.2.2.1 **Air System Balancing**. The supply air outlets in zone terminal devices are required to be equipped with means for air balancing in accordance with chapter six of the international mechanical code calculations.

SECTION 01 15 00 - BUILDING CODES

(Applies to all Trades)

PART 1 - GENERAL

GENERAL CONDITIONS

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

This Building is IBC Risk Category - Type 3. Include in Bid by each Trade all additional securements, attachments, bracing, strengthening, etc. as required by this Seismic Classification for equipment and materials by having this Classification.

A. CODES AND DESIGN SPECIFICATION

The following codes are an outline of minimum code and design requirements and their application. Manufacturer specification and local code requirements, when in excess of minimum specification, shall control. It is the Contractors responsibility to review and submit all Shop Drawings with appropriate code standards and report all document discrepancies to the Architect prior to fabrication or erection.

1. FIRE MARSHAL ACT

- "Life Safety Code" by the National Fire Protection Association, 2015 Edition
- Public Law 101-336, Americans with Disabilities Act, 2010
- Uniform Federal Accessibility Standards (UFAS, 1988)
- Nondiscrimination on the Basis of Disability in State and Local Government Services (28 CFR, CH. 1, Part 36, 1999)
- ADA Accessibility Guidelines for Transportation Vehicles (Architectural and Transportation Barriers Compliance Board, 36 CFR, CH. XI, Part 1192, 1999)

2. UNIFORM BUILDING CODE COMPLIANCE

The following are the codes now in effect per Act 12 and effective as of January 1, 2023 for the State of Louisiana:

The Minimum Codes Mandated by Act 12 using the latest adopted versions of:

- 2021 International Energy Conservation Code (IECC)
- 2021 International Building Code (IBC)
- 2021 International Residential Code (IRC)
- 2021 International Existing Building Code (IEBC)
- 2021 International Mechanical Code, Edition (IMC).
- 2021 International Plumbing Code (IPC).
- 2021 International Fuel Gas Code (IFGC).
- 2020 National Electric Code (NEC).

This list was prepared after a thorough review of **Act 12**, which was made law in November of 2005. Additional documents reviewed include **Title 55, Part VI Uniform Construction Code Rules** as published in the Louisiana Register, Vol 32, No. 09, dated September 20, 2006. This also includes information that is currently being put into effect

as "emergency rules", and therefore not published as of the current date. Certain exceptions apply to some of the adopted codes, as detailed below:

Details On Adopted Codes International Building Code, 2021 Edition, plus Chapter 35 Referenced Standards

Adopted with the exceptions of:

- a. Chapter 1, Administration
- b. Chapter 11, Accessibility
- c. Chapter 27, Electrical Use latest adopted National Electric Code

3. INSTALLATION ACCORDING TO LOUISIANA UNIFORM CODE:

The design intent is for all new Work to comply with the adopted codes listed above.

The New Construction shall comply with the IBC and the requirements of the Louisiana Fire Marshal Official Manual, National Fire Protection Agency 101, the local Authority Having Jurisdiction and the Building Official.

It shall be the responsibility of the Contractor to:

- a. Conform to the requirements of these codes where referenced.
- b. Pay all Building Permit and Inspection Cost.
- c. Provide copies of Plans to Building Official as required for their review. Retain one returned copy with comments at the construction site.
- d. Contact Authority Having Jurisdiction to establish Inspection Dates
- e. Comply with the AHJ requirements.
- f. Send Copy of AHJ Inspection Reports to Architect.
- g. Contact Building Official after Work is ready to inspect.
- h. Provide access and means for inspection of the Work.
- i. Comply with the Building Official's requirements. Work shall not be done beyond the point indicated in each successive inspection without first obtaining the approval of the building official.
- j. Send Copy of all Building Official's Inspection Reports & Certificate of Occupancy to Architect.

The Architect has endeavored to include all of the Code Requirements within the Contract Documents or Addendum; however, it is not practical to reference every code section or indicate every condition. Failure of the Architect to include a particular requirement shall not relieve the Contractor or sub-contractors from providing a product and installation in accordance with the codes. Because of the size & cost of this Project, it is believed that most Trades will have to be licensed in their respected trade or craft. Therefore; the licensed contractors and sub-contractors are expected to know the requirements of the codes now required by the State of Louisiana.

END OF SECTION

FIRE MARSHAL REPORT

The work required by the Fire Marshal Report has already been incorporated into the Contract Documents except for the deferred submittals. The report is included for reference.



Jeff Landry
GOVERNOR

Office of State Fire Marshal

8181 Independence Blvd. Baton Rouge, LA 70806
(225) 925-4911 (800) 256-5452 Fax (225) 925-4241



Chief Bryan J. Adams
FIRE MARSHAL

PLAN REVIEW REPORT

WILLIAM LAND LAND 3 ARCHITECT INC., A PROFESSIONAL CORPORATION
1900 STUBBS AVE., STE. A
MONROE LA 71201

Project Number: **AR-24-015908**
Review Type: **Architectural Review**
Status: **RELEASED**
Date Completed: **9/20/2024**
Code Edition: **2021**

In accordance with L.R.S. 40:1574 et seq., satisfactory compliance with the requirements of the laws, rules, regulations and codes of the state that are entrusted to the State Fire Marshal to uphold must be achieved before any work is performed. As such, a permit shall not be issued or construction or installation of the scope of work identified herein shall not commence until the Status of this review is "Released" and the requirements of other state and local entities have been satisfied.

Project Description: LEVEL 3 ALTERATION TO EXISTING BUILDING TO CONVERT FROM OFFICE SPACE TO NEW LIBRARY			
Project Name: OUACHITA PARISH PUBLIC LIBRARY MAIN BRANCH RENOVATION		Address: 1000 OLIVER ROAD, MONROE, LA 71201	
Funding Type: Municipal Owned	Within City Limits? YES	Number of Stories: 2	High Rise Building: No
Occupancy Separation Type: Non-separated Occupancies	Total Occupancy Square Feet: 48096	Project on which Floor(s): 1, 2	Construction Type: II-B / II (000)
Additional Features (if applicable): Sprinkler System - 13, Fire Alarm System, Generator (Non-Required)			

Occupancy Type(s) and Square Feet		
Occupancy Type: Assembly - Group A	Square Feet: 42200	Details: OCCUPANCY RATING: 300 TO 499 OCCUPANTS; ASSEMBLY TYPES: GROUP A-3
Business	5896	

Renovation		
Renovation or Addition: Alteration Level 3 (more than 50% of the building's physical value), Change in use of the building		
Date of Original Building Construction: 1/1/1971		
Date of Latest Major Renovation to this Building: 1/1/2017		
Existing Square Feet: 48096	Additional Square Feet:	Renovated Square Feet: 48096
Previous Occupancies: Business		
Generator Installation:		

Facility Licensed By DHH Health Standards Section: No
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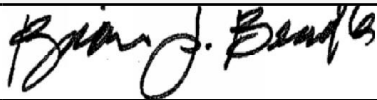
Louisiana State Uniform Construction Code Review	
Review for the LSUCCC performed by: Parish or Municipal Permitting Office	3rd Party Provider's Registration Number:

Individuals Involved in this Project		
Name: WILLIAM A LAND	Role: Professional of Record (A-4155)	Address: 1900 STUBBS AVE., STE. A, MONROE, LA 71201
BRAD CAMMACK	Owner	100 BRY STREET, MONROE, LA 71201

Changes that are inconsistent with the reviewed documents are not authorized unless reviewed by this office for compliance with adopted codes, rules and laws. The changes must be submitted to this office by the Professional of Record where required by law, otherwise by the Owner, for review prior to construction and inspection. Minor changes may be submitted as supplemental information amended to this assigned project number. Changes that alter the scope of work, or that otherwise will require another full review of the project, will require a complete resubmittal of the entire scope of work with application, revised plans, and applicable review fee.

This review shall in no way permit or authorize any omissions or deviations from the specific requirements of the adopted codes, rules and regulations of the state. Construction permits must be issued or installation must commence within 180 days from the date of the "Released" Status for this submittal.

Occupancy of the project will not be permitted until a satisfactory inspection of the completed construction has been made by this office. Please allow at least two (2) weeks advanced notice to schedule inspections.

Review Completed By	
Signature:	
Name: Brian Beadle	Badge No.: 650

Distribution List		
Name	Firm Name	Role
OUACHITA PARISH HWY. DEPT.		
CHIEF TERRANCE TAYLOR*		Fire Prevention Bureau
PATRICK HEMPHILL*		
CHIEF TERRY WILLIAMS*		Fire Prevention Bureau
CITY OF MONROE*		

Cautionary Codes

The items listed below are comments for informational purposes or identified requirements that will be verified upon final inspection by this office. These requirements need not be addressed back to the reviewer, however should be addressed prior to construction and inspection scheduling. Failure to comply with or otherwise address these items may affect final occupancy and use of the structure.

- 1 Scope of work: This review applies to the INTERIOR and EXTERIOR RENOVATION / RECONFIGURATION / CHANGE OF OCCUPANCY of a 2-story SPRINKLED (13) building formerly used as a Retail Store to be used as the Main Library for Ouachita Parish. Existing second floor office space has two (2) enclosed, separated remote exits. A new elevator is being installed between the floors.
- A new fire alarm system is required and proposed to be installed.
- LSC: ASSEMBLY; BUSINESS
IBC: GROUP A-3; GROUP B
- 2 FIRE PROTECTION SYSTEMS:
- 2.1 Modifications to the existing sprinkler system shall be in accordance with NFPA 13, 13R or 13D as applicable.
- LRS 40:1574 Submit automatic sprinkler system shop drawings ON-LINE at <https://lasfm.louisiana.gov/>. Such work shall not commence until shop drawings have been found to be in compliance with applicable codes by this office. LINK the associated "AR" (architectural project) submittal, or reference it in the PROJECT NAME.
- Note: See Interpretive Memorandum 2013-03 for submittal requirements.
- 2.2 101:12.3.4 and IBC 907 Provide a fire alarm system in accordance with Section 9.6 and IBC 907.5. In facilities required to be fully accessible, alarm notification shall be by both audible and visual means in accordance with NFPA 72.
- LRS 40:1574 Submit fire alarm system shop drawings ON-LINE at <https://lasfm.louisiana.gov/>. Such work shall not commence until shop drawings have been found to be in compliance with applicable codes by this office. LINK the associated "AR" (architectural project) submittal, or reference it in the PROJECT NAME.
- 2.3 LAC 55:V:303.E Provide listed portable fire extinguishers in accordance with NFPA 10. (Refer to Appendix E for distribution information.)
- Classification:
- Class A fires: fires in ordinary combustible materials, such as wood, cloth, paper, rubber and many plastics. Travel distance to a fire extinguisher shall not exceed 75 feet.
 - Class B fires: fires in flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols and flammable gases. Travel distance to a fire extinguisher shall not exceed 30 feet for Class B fires (liquids). (May be increased to 50 feet for Light (low) Hazard fires with 10-B extinguisher, for Ordinary (moderate) Hazard fires with 20-B extinguisher, and for Extra (high) Hazard fires with 80-B extinguisher). See Table 10:6.3.1.1.
 - Class C fires: fires that involve energized electrical equipment. Travel distance to a fire extinguisher shall not exceed 75 feet.
- 3 BUILDING CONSTRUCTION and COMPARTMENTATION:
- 3.1 101:8.2.2.2 and IBC 707.5 Fire compartments shall be formed with fire barriers that comply with Section 8.3 and are continuous in accordance with Section 8.3.1.2 from outside wall to outside wall or from one fire barrier to another, or a combination thereof, including continuity from the floor through all concealed spaces, such as those found above a ceiling, including interstitial spaces. Continuity is permitted to terminate at a ceiling, if the construction assembly of the ceiling has a fire resistance rating not less than that of the fire barrier. In combustible construction, hollow vertical spaces within the fire barrier wall shall be fireblocked at every floor level, per IBC Section 718.2. Joints and voids at intersections shall comply with IBC Sections 707.8 and 707.9.
- 3.2 101:8.3.5 Penetrations through rated construction shall be sealed by approved firestop systems or devices tested in accordance with ASTM E814 or UL 1479.
- Notify the District Office identified at the end of the attached PROJECT DATA REPORT for inspection of all completed fire and/or smoke barrier walls before any construction is installed that would conceal such construction and prevent a proper inspection. Access to randomly selected areas may be required by the inspector at time of final inspection if this notification is not given.
 - Provide detailed instructive cut sheets of the fire penetration sealing system used to the inspector at time of inspection. Random selective sampling by the contractor will be observed by the inspector.
- 3.3 101:9.4.3.1 New elevators shall conform to the Fire Fighter's Service Requirements of ASME A17.1/CSA B44, Safety Code for Elevators and Escalators. Elevator recall shall be activated by smoke detection in each elevator lobby and in associated elevator machine rooms.
- 3.4 LRS 40:1582 Provide elevator keys, to allow all elevators to operate in fire emergency situations with one master elevator key, in accordance with all provisions of this statute, including the following:
- Issue master elevator keys ONLY to authorized personnel, including the fire department in whose jurisdiction the building is located.
 - Master elevator keys shall NOT be issued to any emergency response agency, other than the authorized fire department personnel.
 - Master elevator keys shall NOT be duplicated without specific authority and approval.
 - Every master elevator key shall be marked "DO NOT DUPLICATE".

	3.5	101:38.2.2 and IBC 1023.2 Enclose interior stairs with 1 hour fire resistive construction including self-closing 1 hour labeled door/frame assemblies. (101:7.2.2.5.1)
4		MEANS OF EGRESS:
	4.1	101:12.2.9 and IBC 1008 Provide emergency lighting according to 101:7.9 and IBC 1008.3, including exit discharge (exterior).
5		EGRESS DOORS:
	5.1	101:7.2.1.3 and IBC 1010.1.4 through 1010.1.6 Provide level landings outside exterior doors that are within 1/2" of the interior finish floor elevation.
	5.2	101:12.2.2.2 and IBC 1010.2.9 Doors in a required means of egress shall NOT be equipped with a latch or lock other than panic hardware or fire exit hardware, under the following conditions; - Areas serving ASSEMBLY use areas having an occupant load of 50 or more persons,
6		EGRESS STAIRS:
	6.1	101:7.2.12.1.1 and IBC 1009.8 Provide two-way communication between the elevator landing(s) and a central point that is constantly attended or equipped to provide automatic telephone dial-out capability to an approved location (located in coordination with the local fire department). The two-way communication system shall: - include directions for the use of the two-way communication system - instructions for summoning assistance via the two-way communication system - written identification of the location shall be posted adjacent to the two-way communication system. - be in accordance with ADA-ABA 207 and 216.
7		INTERIOR INSULATION and FINISHES:
	7.1	101:12.3.3 and IBC 803 Interior walls and ceiling finishes shall be Class A, B or C: flame spread of 0-200 and a smoke development rating of 0-450.
	7.2	LAC 55:305 Insulation and insulation assemblies shall meet the requirements of Section 720, International Building Code, 2021 Edition. - Concealed and exposed insulation shall have a flame spread of 0-25 and a smoke developed of 0-450 in accordance with IBC 720. - Cellulose fiber thermal insulation shall meet the requirements of paragraph IBC 720. Foam Plastic Insulation shall meet the requirements of IBC 2603, and NFPA 101:10.2.4.3. - Foam plastic shall have a flame spread of 0-25 and a smoke developed of 0-450 where tested in accordance with the provisions of IBC 2603.3 and NFPA 101:10.2.4.3. Thermal barriers shall protect foam plastic insulation in accordance with IBC 2603.4. - Intumescent coatings used as an alternative to the thermal barrier required over foam plastic insulation shall be approved by this office prior to installation. Provide evaluation report(s) for review that document test results in accordance with the provisions of IBC 2603.9 and NFPA 101:10.2.4.3 as a complete assembly. - Approved alternative thermal barrier coatings shall be tested on the foam plastic insulation product proposed and listed as a complete assembly related to actual end-use configuration. Such coatings shall be applied to the thickness indicated by the evaluation report. Ignition barrier assemblies or other intumescent coatings tested in accordance with provisions other than those referenced by IBC 2603.9 are NOT an acceptable alternative to the thermal barrier. - Alternative Ignition barriers complying with IBC 2603.4.1.6 may protect foam plastic insulation used in attics or crawl spaces, where entry is made only for service of utilities, in lieu of the thermal barrier.
8		MEP:
	8.1	Emergency generator systems shall comply with the provisions of NFPA 37 (2010 edition) and 110 (2013 edition). - NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines. - NFPA 110, Standard for Emergency and Standby Power Systems. - LAC 55:V:1301.A.1 Emergency power must be provided in conformity with NFPA Code 99 for a minimum 48 hour duration for all hospitals, skilled nursing facilities or any other facility utilizing life support systems on a 24-hour day basis.
9		GENERAL COMMENTS:
	9.1	LRS 40:1711 Provide safety glazing in hazardous locations. (See IBC 716.1.2.1 and 2406)
10		ACCESSIBILITY FEATURES:
	10.1	LRS 40:1731-(Effective 10/01/11) Provide access for persons with disabilities in accordance with the ADA-ABA Accessibility Guidelines, July 23, 2004 (also known as the 2010 Standards). This does not include a review for compliance with the Federal Americans with Disabilities (Civil Rights) Act of 1990. Compliance with state regulations and requirements does not guarantee compliance with federal law. NOTE: As per ADA-ABA 2004, Section F103, Office of State Fire Marshal equivalency determinations are not valid for facilities that are designed, constructed, altered, or operated with federal funds, or leased by a federal agency. The authority having jurisdiction over such appeals is the administrator of the General Services Administration (GSA). Particular observations and paragraph references are noted as follows:

10.2	ADA-ABA:208 Provide 6 accessible parking spaces. One of every 6 accessible spaces but not less than one shall be "Van Accessible" (96" wide space plus 96" wide aisle OR 132" wide space plus 60" wide aisle) as per section 502. And as per Section 216.5 provide signage at accessible parking as per Section 502 where there are 5 or more parking spaces on a site.
10.3	ADA-ABA:211.2 Provide a drinking fountain/water bottle filling station spout height of 36" above the finish floor AND provide a drinking fountain spout height of 38"-43" above the finish floor. Drinking fountains shall comply with Section 602. (50% of the total number provided shall be at 36" and 50% shall be at 38"-43")
10.4	ADA-ABA:227.2 Where service counters or sales counters are provided, at least one at each location shall be accessible and shall comply with Section 904.4.
	<p>ADA-ABA:904.4 Sales counters and service counters shall comply with one of the following and the accessible portion of the counter shall extend the same depth as the sales or service counter top:</p> <ul style="list-style-type: none"> - 904.4.1 Provide a portion of the counter surface that is 36" long minimum and 36" high maximum above the finish floor or ground with a 30" x 48" clear floor space positioned for a parallel approach. - 904.4.2 Provide a portion of the counter surface that is 30" long minimum and 36" high maximum above the finish floor or ground with a 30" x 48" clear floor space positioned for a forward approach.
11	<p>LRS 40:1730.49.B and 40:1563 REVIEW FOR COMPLIANCE WITH THE LIFE SAFETY AND FIRE PROTECTION REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE ARE INCLUDED IN THIS REVIEW. Contact the building official of the applicable political subdivision to coordinate compliance with the complete requirements of the Louisiana State Uniform Construction Code (LSUCC). LRS 40:1730.23 mandates the enforcement of the LSUCC codes by municipalities and parishes in Louisiana, as described by LRS 40:1730.28. LRS 40:1730.23.H permits a parish or municipality to accept determinations made by the state fire marshal as they pertain to life safety and fire protection as required by the LSUCC.</p>

SECTION 01 21 00 - ALLOWANCES**PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. The general provisions of the Contract, including General and Supplementary Condition and Division 1 Specification Sections are hereby made a part of this section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Cash allowances.
 - 2. Contingency allowance.
 - 3. No Unit Prices in this Project.
- B. Related Sections
 - 1. Individual specification sections.
- C. Include in Contract Sum cash allowances specified in individual sections and contingency allowance specified in this Section.
- D. Designate in Construction Progress Documentation specified in Section 01 32 00 delivery dates for products under each allowance.
- E. Designate in Schedule of Values quantities of materials specified under unit cost allowances.

1.3 CASH ALLOWANCES

- A. General:
 - 1. Purchase products under each allowance as directed by Architect.
 - 2. Amount of allowance includes:
 - a. Net cost of product, less any applicable trade discounts.
 - b. Delivery to site.
 - c. Applicable taxes.
 - d. Labor required under allowance, only when labor is specified to be included in allowance.
 - 3. In addition to amounts of allowances, include separately in Contract Sum, Contractor's costs for:
 - a. Handling at site, including unloading, uncrating, and storing.
 - b. Protection from elements and from damage.
 - c. Labor required for installation and finishing, except where labor is specified to be part of allowance.
 - d. Other expenses required to complete installation.
 - e. Overhead and profit.
- B. Selection of Products:
 - 1. Architect's Duties:
 - a. Consult with Contractor in consideration of products and suppliers.
 - b. Make selection; designate products to be used.
 - c. Prepare Change Orders.
 - 2. Contractor's Duties:
 - a. Assist Architect in determining:
 - 1) Supplier or installer, as applicable.
 - 2) Cost, delivered and unloaded at site.
 - b. Obtain proposals from suppliers when requested by Architect.

- c. Notify Architect of any effect anticipated by selection of product or supplier under consideration on construction schedule or contract sum.
 - d. On notification of selection, enter into purchase agreement with designated supplier.
- C. Delivery:
- 1. Contractor's Duties:
 - a. Arrange for delivery and unloading.
 - b. Promptly inspect products for damage or defects.
 - c. Submit any claims for transportation damage.
- D. Installation: Comply with requirements of referenced specification section.
- E. Adjustment of Costs:
- 1. Should actual purchase cost be more or less than specified amount of allowance, Contract Sum will be adjusted by Change Order equal to amount of difference.
 - 2. Amount of Change Order will recognize any changes in handling costs at site, labor, installation costs, overhead, profit, and other expenses caused by selection under allowance.
 - 3. For products specified under unit cost allowance, unit cost shall apply to quantity listed in Schedule of Values.
 - 4. Submit invoices or other data to substantiate quantity actually used.
 - 5. Submit any claims for additional costs at site or other expenses caused by selection under allowances, prior to execution of work. Failure to do so will constitute waiver of claims for additional costs.

1.4 CONTINGENCY ALLOWANCE

- A. Include in Contract Sum a stipulated sum of \$ 4,000 for additional Landscaping as determined by Architect.
- B. Include in Contract Sum a stipulated sum of \$ 3,000 for additional Lighting as determined by Architect or Fire Marshal.
- C. Include in Contract Sum a stipulated sum of \$ 3,000 for additional Hardware as determined by Architect/User.
- D. Include in Contract Sum a stipulated sum of \$ 5,000 for Podcast Audio Equipment(USB Mic, USB Mixer, Camera, etc). to be installed by General Contractor.
- E. Include in Contract Sum a stipulated sum of \$10,000 for Vinyl Applied Graphics to glass. This will be the direct cost from a local graphics company such as HD Graphics.
- F. Funds will be drawn from Contingency Allowance and documented at end of project by Change Order.
- G. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 01 23 00 – ALTERNATE BIDS**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate or Alternate Bid: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost for each alternate is the **net addition** to the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section. Refer to Specification Sections & Plans including those referenced in the schedule. Include all associated work as necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)**PART 3 – EXECUTION**

3.1 SCHEDULE OF ALTERNATES

Alternate Bid 1

New Exterior Windows and Replacement Windows as shown on Sheet A2.2.

Alternate Bid 2

Replace existing surface mount sprinkler heads with flush type as shown on Sheet FP1.1

Alternate Bid 3 –

Clean Agent Fire Suppression System for Areas shown on Sheet FP1.1

END OF SECTION

SECTION 01 25 00 - PRODUCT SUBSTITUTION

(Approval Request for Equals)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes the following procedural requirements for Prior Approval product substitution in this Project.
1. Bidders and Suppliers desiring the assurance of approval prior to Bid Date that their product is "equal" require Prior Approval submittal to Architect prior to bids in accordance with this section.
 2. Product Substitution request for equal after Bid Date is allowed in accordance with the La. Bid Law.
- B. Architect does not have the resources to search links to websites for additional information needed or respond to each inquiry by mail, phone or email so include complete information about the substitution with submittal.

1.3 PRIOR APPROVAL FOR EQUAL PRODUCTS

- A. **Product Substitution Requests for All Divisions** : At least 7 working days prior to Bid Date, the architect shall receive one printed or emailed copy of the request for consideration with supporting data. Emailed submittals are acceptable only if entire submittal with all supporting data is 20 pages or less. Mail to Bill Land AIA, Land 3 Architect Inc., 1900 Stubbs Ave., Monroe, LA 71201 or email 20 pages or less to Bill@Land3.com.

All Substitution Request prior to Bids shall include the completed SUBSTITUTION REQUEST FORM included at the end of this section. Only one Substitution Request Form in required for the entire Submittal by the supplier. Do not need individual form for each product. Submittals without this form shall not be considered. Faxed Submittals are not acceptable.

- B. **To ensure that the Architect receives the Substitution Request, use US mail, hand delivery, certified mail with receipt or send by Express Carrier the printed substitution information to the Architect and Engineer if Applicable.** Submit in accordance with Instructions to Bidders "Article 3.03 Substitutions" and this Section.

Substitution Request by FAX is NOT ACCEPTABLE.

Emailed substitution request of 20(letter size) pdf. pages or less (including Substitution Form) may be considered when transmitted to Bill@Land3.com in accordance with the other requirements of Section 01 25 00; however, emailed substitution request are not guaranteed by Architect to be received, printed, correlated, and reviewed in time; therefore, Mail, Hand Delivery or Express Carrier is preferred method of submittal to Architect.

- C. Designer is not responsible for claims by other parties that Substitution Request was successfully submitted but not received by Architect or Engineer. For this reason, mail or express carrier with return receipt is strongly recommended.

- D. All information submitted must be legible and have a font size of at least 9.
- E. All information from a vendor or supplier shall be submitted in one transmittal. The Architect shall not be required to search websites and follow internet links that further explain the product.
- F. Incomplete request requiring additional information requested by the Architect must be submitted to the architect within 7 working days prior to bids.
- G. Refer to each Section in the Specifications for additional submittal information such as “mock ups” or “samples” required for Architect to approve prior to Bids. Samples of materials are encouraged.
- H. When requested by Architect, provide:
 - 1. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - 2. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
- I. Architect's & Engineer's Action: If necessary, Designer will request additional information or documentation for evaluation.
- J. Designer will consider request for substitution when the following conditions are satisfied.
 - 1. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 2. Requested substitution provides design characteristics that specified product provided.
 - 3. Substitution request information is complete and includes enough detail for an adequate evaluation and request is properly submitted.
 - 4. Requested substitution will not adversely affect Contractor's construction schedule.
 - 5. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 6. Requested substitution is compatible with other portions of the Work.
 - 7. Requested substitution has been coordinated with other portions of the Work.
 - 8. Requested substitution provides specified warranty.
 - 9. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

1.4 EQUAL PRODUCTS

- A. Equal Brands: Assurance of Product Acceptance other than those specified or indicated on the drawings require Prior Approval request for substitution as noted above in Section 1.2 A.(1).
- B. The name of a certain brand, make, manufacturer, or definite specifications is to denote the quality standard of the article desired, but does not restrict bidders to the specific brand, make, manufacturer or specification named. It is to set forth and convey to prospective bidders the general style, type character, and quality of article desired.
- C. When in specifications or contract documents a particular brand, make of material, device or equipment is shown or specified, such brand, make of material, device, or equipment shall be regarded merely as a standard.
- D. If a Product Model number indicated should change or product be discontinued, provide the same company's comparable product or upgrade for those product model numbers that are discontinued or changed prior to Bids or during construction. An incorrect or outdated model

number shall not relieve the contractor from providing a similar product. The Supplier or Contractor shall advise the architect a minimum of 7 days prior to bids of any known model number changes or discontinued products.

- F. The Designer's Decision with regard to Prior Approved Equal request shall be final and may be based on subjective and aesthetic reasons which may not be appreciated or understood by some.
- G. Those manufacturers that are granted Prior Approval will be listed in the Addenda. Final approval for the product will be based on a shop drawing submittal complying with the specific contract documents. Where the product specified includes specific requirements & features such as color, selection, STC rating, warranty, etc., the substitution shall meet the same requirements as originally stated in Specifications. A standard color or feature for the specified product shall be provided by the substituted product, even if the feature is an option for the substitution.
- F. "Prior Approval Equal" or "Approved Equal" or "Equal" wording shall include product approval prior to installation such as approval by shop drawing submittal.

SUBMIT SUBSTITUTION FORM ON NEXT PAGE FOR ALL PRIOR APPROVAL REQUEST

PROJECT SUBSTITUTION REQUEST FORM

Required to be submitted To Architect/Engineer with all Prior Approval Request **DO NOT FAX**

Date: _____ Architect's Project Name: _____

To: Architect: Bill Land _____

Specification Section: _____ Description: _____

Page: _____ Article/Paragraph: _____

List of Proposed Substitution (Manuf. & Model No.): _____

Number of pages attached including this form is _____

Sample of Product was delivered to: _____

The Undersigned certifies:

Attached data includes product description, specification, drawings, photographs and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.

Same warranty will be furnished for proposed substitution as for specified product.

Same maintenance service and source of replacement parts, as applicable, is available.

Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.

Proposed substitution does not affect dimension and functional clearances.

Payment will be made for changes to building design, including A/E design, detailing and construction costs caused by the substitution.

Attached data also includes a description of changes to the Contract Documents that the proposed substitutions will require for its proper installation.

Submitted by: _____

Signed by: _____

Firm Name: _____

Address: _____

Phone: _____

Fax: _____

E-Mail: _____

A/E REVIEW AND ACTION (Do not write below this line)

Substitution approved in accordance with Section 01 25 00.

Substitution approved in accordance with Section 01 25 00 as noted. _____

Substitution rejected - Use specified materials.

Substitution request does not comply with Section 01250 - Use specified materials.

Signed by: _____

Date: _____

Supporting Data Attached: Drawings Product Data Samples Tests Reports _____

Date Substitution Request Received: _____

Architect's Comments: _____

SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. Section includes General Contractor requirements for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
 - 5. Emails
 - 6. Supervision
- B. Each contractor or supplier shall participate in coordination requirements as necessary.
- C. THE OWNER WILL NOT PAY FOR EXTRA COST REQUESTED BY THE CONTRACTOR FOR CONFLICTS THAT COULD HAVE BEEN AVOIDED BY CAREFULL REVIEW OF THE BID DOCUMENTS AND COORDINATION OF ALL TRADES PRIOR TO INSTALLATION.

THE OWNER WILL NOT ACCEPT EXPOSED CONDUIT OR WIREMOLD IN NEW WALLS BECAUSE THE ELECTRICAL CONTRACTOR AND/OR PROJECT SUPERINTENDENT DID NOT CAREFULLY REVIEW THE BID DOCUMENTS. OWNER MAY DECIDE TO ACCEPT EXPOSED CONDUIT AT A COST OF \$200 PER LINEAR FOOT TO BE DEDUCTED FROM CONTRACTOR PAYMENT APPLIC.

1.3 DEFINITIONS

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

1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: The Job Superintendent shall coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
 - 4. The General Contractor shall review documents as stated above and verify that the mechanical, electrical, and plumbing equipment (which is drawn diagrammatically) will fit in rooms and above ceilings as designated. After review of the Equipment Shop Drawings, the Contractor shall make minor modifications to room sizes, equipment locations, ceiling heights as necessary to maintain, support, and house equipment at no additional charge.
 - 5. The General Contractor shall review Casework, Millwork, Mechanical, Electrical & Plumbing (MEP) Drawings & Specifications for coordination purposes. Example: Where Electrical Drawings indicate receptacles on walls where cabinetry or wainscot is shown on other drawings, coordination and care shall be taken to ensure that the receptacles are visible, flush and accessible to reach. The General Contractor shall provide the Casework & Millwork contractor with the MEP drawings for coordinating access to all MEP equipment.

6. The General Contractor shall review drawings, shop drawings and submittal data of all Trades prior to "rough in" to verify that space clearances indicated on plans are adequate and if not make minor adjustments (without additional cost) in the Work to accommodate the clearance as necessary for proper maintainable functioning equipment. The Architect shall not authorize Change-Orders for changes that could have been avoided if the General Contractor had carefully reviewed the product information being provided prior to "rough in".
 7. The User Agency request high ceilings as possible. The General Contractor shall review the anticipated work under Division 5, Division 21, Division 22, Division 23 & Division 26 with each respective trade. The General Contractor shall coordinate & prioritize the work under these divisions in order to maintain the ceiling heights indicated on the plans as close as possible. **Locations where utilities and ductwork intersect shall be carefully studied prior to installation** and a shop drawing sketch be provided to the Architect to confirm that all utilities will fit.
 8. Coordination with all trades is mandated, particularly the Mechanical, Electrical and Plumbing disciplines which may require additional demo other than that shown on the plans. If a subcontractor intends to remove more of any existing materials than shown in plans, he needs to inform the General Contractors (GC) prior to bidding so that GC can alert the effected trade to include the additional demo & replacement materials in his Bid Cost. Examples would be the Sprinkler Contractor who wants more existing ceilings removed to facilitate new sprinkler lines or the Mechanical Contractor who wants more ceilings removed to facilitate new ductwork or equipment.
- B. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Request for Inspections by Authorities Having Jurisdiction and Regulatory Agencies.
 7. Pre-installation conferences.
 8. Project closeout activities.
 9. Startup and adjustment of systems.

1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form of an Email with the subject denoted in the email subject header.
1. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. RFI Format: Not required if Email request to Architect is used with RFI & subject in Heading.
- C. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 12:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs may be returned without action:
 - a. Requests for approval of Contractor's means and methods.
 - b. Requests for coordination information already indicated in the Contract Documents
 - c. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Order in accordance with Supplementary Conditions.

1.6 PROJECT MEETINGS

- A. **General:** Architect will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Architect & General Contractor shall Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times at least 7 days prior to meeting.
 2. Agenda: Architect or GC shall prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned in pdf. format, including General Contractor, Owner and Architect.
- B. **Pre-Construction Conference:** Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect..
1. Conduct the conference to review responsibilities, personnel assignments, and procedures.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Use the Architect's Pre-Construction Conference agenda.
 4. Minutes: Architect will record and distribute meeting minutes.
- C. **Pre-Installation Conferences:** Only Required if requested by Architect for a particular item. Architect will conduct a pre-installation conferences before each construction activity only if needed and that requires coordination with other construction.
- D. **Project Closeout Conference:** Use Architect's Pre-Closeout Conference Agenda if such as meeting is required by the Architect.
- E. **Progress Meetings:** Architect will conduct progress meetings only as required and shall distribute by email the meeting notes to each of the prime parties.
- F. **Emails:** All email correspondence to Architect shall have an accurate subject matter included.

G Supervision: It is not the Architect's or Engineer's duty to direct or guarantee the work of the Contractor, but to assist the Owner in obtaining a complete building in accordance with plans, specifications and addenda and to furnish design services in accordance with recognized practices. The Contractor (not the architect) is responsible for guaranteeing the work of all sub contractors.

Job Superintendent must have minimum 5 years of similar type and size of contrition, must be full time dedicated to this project. Job Superintendents who remain employed with the General Contractor shall remain on this project until Final Completion. If the General Contractor wants to substitute another Superintendent, both Architect and Owner must approve. If General Contractor substitutes another Job Superintendent without both Architect and Owner written authorization, \$200.00 (Two Hundred Dollars) per Calendar day until Final Completion.

Project Manager and person signing the Payment Application shall visit the Project site monthly prior to submitting Payment Application and affirm that the work in place is accurately reflected on the Monthly Pay Application.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 1. Contractor's Construction Schedule.
 2. Daily construction reports.
 3. Initial Site Condition Report (recommended to protect contractor's interest but not required)
 4. Buildings Condition Report (recommended to protect contractor's interest but not required)
 5. Photographic Documentation (recommended to protect contractor's interest but not required)
 6. If Reports indicated by 3,4 & 5 are not provided, Contractor may not have proof of existing damage prior to construction beginning.

1.3 RELATED REQUIREMENTS

- A. Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.

1.4 SUBMITTALS

- A. Qualification Data: For scheduling consultant.
- B. Contractor's Construction Schedule: Submit two paper copies of initial schedule, large enough to show entire schedule for entire construction period.
- C. Daily Construction Reports: Submit two copies at monthly intervals.
- D. Initial Site Condition Report: Submit two copies at Pre-Construction Conference.
- E. Building Condition Report: Submit two copies at Pre-Construction Conference.
- I. Photographic Documentation: Submit two copies at Pre-Construction Conference.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Time Frame: Extend schedule from date established from the Notice to Proceed to date of Substantial Completion.
- B. Computer Software: Prepare & update Gantt Chart type schedules using a program that has been developed specifically to manage construction schedules.
- C. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- D. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.2 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.

4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions.
 7. Accidents.
 8. Meetings and significant decisions.
 9. Unusual events (refer to special reports).
 10. Stoppages, delays, shortages, and losses.
 11. Emergency procedures.
 12. Orders and requests of authorities having jurisdiction.
 13. Change Orders received and implemented.
 14. Construction Change Directives received and implemented.
 15. Services connected and disconnected.
 16. Equipment or system tests and startups.
 17. Partial Completions and occupancies.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.3 INITIAL SITE & BUILDING REPORTS

- A. Initial Site Condition Report: Document condition of adjacent properties (paving, lawns, landscaping etc.) that may be affected by the work required by the Project.
- B. Initial Buildings Condition Report: Document condition of adjacent buildings that may be affected by the work required by the Project.

2.4 PHOTOGRAPHIC DOCUMENTATION

- A. Preconstruction Photographs: Before commencement of demolition, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points.
- B. Format: Submit Digital images in JPG format.
- C. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show preexisting conditions. Take close-ups to document existing damage to existing adjacent buildings or site.
- D. Cell Phone photos shall be provided to architect when requested.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule at each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
- B. Distribution: Distribute copies of updated proposed schedule to all parties at Monthly Meeting.

3.2 DELAYS CAUSED BY OWNER OR ARCHITECT AFFECTING CONSTRUCTION SCHEDULE

- A. Contractor shall advise Architect of all delays caused by Owner or Architect on a weekly basis.

END OF SECTION

SECTION 01 33 00 – SUBMITTAL PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Contractor's option to submit electronically in pdf. format or paper copy. If Paper format is used, ask Architect about the number of needed copies.

1.3 RELATED REQUIREMENTS

- A. Refer to the following Sections if included in the set:
 - 1. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 2. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 3. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.4 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.5 ACTION SUBMITTALS

- A. Submittal Schedule: If requested, submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. The General Contractor's Project Manager or Job Superintendent shall be required to thoroughly review, coordinate & check all Submittal Data prior to forwarding to the Architect.
 - 3. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.

1.6 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Limited Electronic digital data files of the Contract Drawings in PDF or DWG format may be provided by Architect for Contractor's use in preparing submittals; however, duplication of Architect's Drawing with symbols for Shop Drawing Review is not allowed.
1. Architect may furnish Contractor one set of digital data drawing files for each appropriate discipline (Floor Plans & Reflected Ceiling Plan only) from the Contract Drawings for use in preparing Shop Drawings.
 - a. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - b. Digital Drawing Software Program: The Contract Drawings are available in Autocad 2004 - 1011.DWG format.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 5. Architect reserves the right to delay review on a submittal requiring coordination with other submittals until all related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.
1. Initial Review: Allow minimum of 21 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Re-submittal Review: Allow 7 days for review of each re-submittal.
 3. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 7 days for initial review of each submittal.
 4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
 5. When paper submittals are provided, it shall be the General Contractor's responsibility to deliver submittals to the Architect's Office and pick up Reviewed submittals from the Architect's office upon notification from the Architect. Mailed or shipped submittals will increase the total number of review days noted above due to handling and transport time.
 6. Contractor to advise architect on a weekly basis of any submittal items that are delaying progress or Ordering materials. Additional Days will not be added to the Contract if Contractor does not advise the architect of needed submittals as noted above.
- D. Submittals Required: Place a permanent label or title block on each submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect and Construction Manager.
 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.

- e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.
4. Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return, without review, submittals received from sources other than General Contractor. Architect will return, without review, submittals that do not have the appropriate Review Stamp.
- E. Options: Identify options requiring selection by Architect.
- F. **Deviations from Contract Documents:** On an attached separate sheet of bright yellow paper, prepared on Contractor's letterhead, with label at top of page reading "Deviations from Contract Documents" disclose information that deviates from the Contract Documents. On this page provide information that deviates from Products or Work indicated in Bid Documents including minor variations and limitations. Include same identification information as related submittal. Include reason for deviations and detailed list of additional Work required by the deviation.
- G. Re-submittals: Make re-submittals in same form and number of copies as initial submittal.
- 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. Submittals Review Stamp: Submittals made to the Architect for review and approval **MUST** have the Contractor's shop drawing stamp or letter indicating that the Contractor has reviewed the submittal and approves or approves it as noted. Submittals without such stamp and indications will not be reviewed by the Architect.

2.2 REQUIRED LABEL ON ALL SHOP DRAWING & DATA SUBMITTAL

- A. Contractor's stamp or Letter, signed, certifying to review of submittal, certification of compliance with Contract Documents.
- B. Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
- 1. Submittals: Submit one digital submittal in pdf format or 4 paper copies of each submittal unless otherwise indicated. Architect will return 1 digital letter or more if provided by consulting engineers.
- C. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
- 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.

- b. Manufacturer's product specifications.
- c. Standard color charts.
- d. Statement of compliance with specified referenced standards.
- e. Testing by recognized testing agency.
- f. Application of testing agency labels and seals.
- g. Type of fasteners intended to be used for each product.
- 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Operational range diagrams.
 - c. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
- 5. Submit Product Data before or concurrent with Samples.
- 6. Submit Product Data in the following format:
 - a. Email in PDF format unless otherwise requested by Architect.
 - b. Actual physical samples require 2 samples for color clarity.
- D. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 - 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm) .
 - 3. Submit Shop Drawings in the following format:
 - a. **Email in PDF format unless otherwise requested by Architect.**
- E. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 - 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 - 4. Samples for Initial Selection: Submit manufacturer's color chart s of all available choices consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Mark those sample selections that have been discontinued or are no longer available.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- F. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. 2 paper copies of product schedule or list unless otherwise indicated.

2.3 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit six paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 1. Certify that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 – EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Submittal Requirements: Comply with Section 2 above.
- B. Action and Informational Submittals: Thoroughly review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- C. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 77 00 "Closeout Procedures."
- D. Approval Stamp: Stamp each submittal with a uniform, approval stamp as indicated under 2.2.

3.2 ARCHITECT'S ACTION

- A. Submittals: Architect or his consultant will review each submittal, make marks to indicate corrections or revisions required, and advise Contractor to pick up. Architect will review each submittal and note

response with an action stamp, review letter or both. **In the essence of time, the entire submittal package review may not be returned by the architect and the architect's review letter shall suffice and shall be satisfactory to the contractor. General Contractors are encouraged not to accept prices from suppliers and contractors that don't accept the Architect's Review Letter and require a review stamp on the plans.**

- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- D. Submittals without appropriate Stamp or not required by the Contract Documents may be returned by the Architect without action.
- E. Review of a separate item does not constitute review of an assembly or system in which item functions.
- F. Architect will release submittals to Contractor for distribution.
- G. Failure of Architect to verify dimensions, quantities and that submittal data complies with the Contract Documents does not relieve the Contractor from providing the materials and equipment in accordance with the Contract Documents.
- H. Submittals that have obviously not been reviewed by the General Contractor & Job Superintendent may be returned back to the General Contractor for a thorough review prior to re-submittal to the Architect.
- I. Return of Submittals: Preferred method is email of pdf or for the Project Manager or Job Superintendent to pick up submittals from Architect to ensure delivery. Other methods such as delivery to site by Architect may be provided; otherwise, Contractor shall arrange for pickup from Architect.

END OF SECTION

SECTION 01 40 00 – QUALITY CONTROL**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with the requirements of the Contract Document.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's quality control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Provisions of this Section do not limit requirements for the Contractor to provide quality control services required by Architect, Owner, or authorities having jurisdiction.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. **All Testing shall be paid by the Owner.**
- C. Refer to Divisions 1 through 43 Sections for specific test and inspection requirements.
- D. Use the Minimum Number of Test in 3.2 below ONLY if not indicated in Concrete Section.
- E. Mock up Samples are required for many repetitive installations, including list below as well as those indicated in Sections 1 through 43.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups shall establish the standard by which the Work will be judged.
- D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing agency shall mean the same as testing laboratory.

1.4 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products, services and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 SUBMITTALS

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

- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.
- C. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Ambient conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and re-inspecting.
- D. Permits, Licenses and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A Firm or individual shall be experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project. Their work shall have resulted in construction with a record of successful in-service performance.
- D. Manufacturer Qualifications: A company experienced in manufacturing products or systems similar to those indicated for this Project and with a successful record of in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities that are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- G. Testing Agency: An agency with the experience and capability to conduct testing and inspecting

indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections required to be performed.

- H. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 - 2. Mockups shall be reviewed at end of regularly scheduled monthly meetings or within 10 days of written notification to Architect.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed, unless otherwise indicated as acceptable by Architect.
 - 7. Mockups shall be constructed for Architect approval before proceeding. Contractor who fails to install mockup and receive architect's approval shall assume the risk of installation rejection. In addition to those specification sections that require mockups, include the following materials that are indicated on this project (only include mock ups of the following materials present on this project):
 - a. All Masonry joint types, all masonry reinforcing types & conditions.
 - b. All flashing conditions, base, thru wall, header, etc.
 - c. Sheet Metal Flashing and Trim.
 - d. Brick ties installation
 - e. Rigid Insulation Board
 - f. Window and Door flashing.
 - g. Joint Sealants. (each condition on exterior of building)
 - h. All Floor Tile & Base conditions
 - i. All wall Tile conditions
 - j. Fluid Applied Membrane or mastic
 - k. All types of concrete/masonry anchors & fasteners intended to be used by each trade.*
 - l. Window Blinds
 - m. Connection of stud bottom & top runner to adjacent material including anchor bolts, power driven fasteners.
 - n. All Simpson Metal Connectors
 - o. Roofing items such as curbs, flashings
 - p. Lightning Rod terminals

* Fasteners & Anchors – Along with shop drawing submittal, each trade shall submit to architect the intended spacing & type of fasteners and anchors with manufacturer's engineered chart or report with size, shear strength, pullout strength & embedment length of fastener into concrete, masonry and steel.

1.7 QUALITY CONTROL

- A. Contractor Responsibilities: Where quality-control services are indicated as Contractor's responsibility, Contractor shall engage & pay a qualified testing agency to perform these services.
 - 1. Contractor will furnish Architect with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform. The Owner's preference is to use the same Testing Agency that provided the Geotechnical Report.

2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be paid by Contractor.
- B. Contractor Responsibilities: Unless otherwise indicated, provide quality control services specified and required by authorities having jurisdiction.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality control services. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so request.
 6. Make available, without cost, samples of all materials to be tested in accordance with applicable standard specifications.
 7. Furnish such nominal labor and sheltered working space as is necessary to obtain samples at the project.
 8. Advise the laboratory of the identity of material's sources and instruct the suppliers to allow tests or inspections by the laboratory.
 9. Notify the laboratory sufficiently in advance of cancellation of required testing operations. The contractor shall be responsible to the laboratory for charges due to failure to notify if requirements for testing are canceled.
- C. Special Tests and Inspections: Owner may engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.
1. Testing agency will notify Architect and Contractor promptly in writing of irregularities and deficiencies observed in the Work during performance of its services.
 2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
 3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 5. Testing agency will retest and re-inspect corrected work.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.
- E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 5. Do not perform any duties of Contractor.

- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality- control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting.
 4. Assist agency in obtaining samples.
 5. Facilities for storage and field curing of test samples.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates visible evidence of patching.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

3.2 MINIMUM NUMBER OF TEST – Use this guide if not indicated elsewhere by Engineer.

- A. Soil Test: Minimum number soils tests to be made:
 1. One (1) Proctor Curve for natural ground and each change in natural ground material.
 2. One (1) Proctor Curve for each change in fill material.
 3. One (1) compaction test for each 2500 square feet of natural ground and for each 2500 square feet of each 8" lift of fill material BUT no less than 1 test series per paving, walk or landing area.
 4. Note: Refer to soil compaction requirements as noted in Division 31.
- B. Minimum Number of Substrata Tests below paving:
 1. One (1) Proctor Curve for natural ground and each change in natural ground material.
 2. One (1) Proctor Curve for 2000 square yards of filled area and for each change in fill or base material.
 3. One (1) compaction test for each 250 square yards of each lift of fill or base material, but not less than two (2) tests for each lift.
 4. Note: Refer to base material compaction requirements as noted in Soil Report Section.
- C. Minimum number of Asphalt Tests: Provide Project site inspections, sampling, and Laboratory and project site testing as follows for all types of asphalt paving as specified in "Section 32 12 16 Asphaltic Concrete Paving" and as indicated:
 1. One (1) density and thickness test for each 2500 square feet of asphalt paving, but not less than four (4) tests for each parking lot.
 2. One (1) asphalt analysis (extraction, stability, cement percentage) for each day's plant production.

- D. Minimum number of Concrete Tests: Provide site sampling & testing, and Laboratory testing as follows for all types of concrete paving as specified in other Sections and as indicated: Required Tests: Provide concrete tests and inspections as follows for concrete work specified in Section 03 30 00 & 32 13 14 and as indicated:
1. Coordination: Contact Job Superintendent prior to pours to learn of possible cancelations.
 2. Samples: Sample concrete for slump, temperature and strength as follows:
 - a. Samples per ASTM C-172.
 - b. Cylinders per ASTM C-31 and ASTM C-39.
 - c. Slump per ASTM C-143.
 3. Number of Strength Tests: One each day's concrete pour greater than five cubic yards; one per 8 cubic yards; one per truck, one minimum representative of each concrete element such as footings, slabs, beams, walls, columns, etc. and special separate pours such as for mechanical equipment.
 4. Number of Cylinder per Tests: Two (2) cylinders per test.
 5. Test Procedure: Job cure cylinders for 7 days, transfer to Testing Laboratory and break one cylinder for 7 day strength; Laboratory cure remaining cylinders to be broken for 28 day strength.
 6. Test Reports: Test reports shall indicate date of pour and date of breaks, location of pour, mix and strength, air and concrete temperature, slump, results of compression test, amount of water added at project site.

END OF SECTION

SECTION 01 42 00 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition and Division 1 Specification Sections are hereby made a part of this section.

1.2 DEFINITIONS

- A. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.
- B. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.
- C. "Approved": The term "approved," when used in conjunction with the Architects action on the Contractor's submittals, applications, and requests, is limited to the Architects duties and responsibilities as stated in the Conditions of the Contract.
- D. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- E. "Furnish": The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
- F. "Install": The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- G. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
- H. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 - 1. The term "experienced," when used with the term "installer," means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.
 - 2. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
 - 3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.
- I. "Project Site" is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- J. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
- K. "Typical": The term "typical" shall mean typical for all similar conditions in entire Project.

- L. "Related Sections" or "Related Sections include the following" shall reference other specification sections with contiguous work for coordination purposes or shall reference other specification sections for work required for the functioning of specified section.
- M. "Existing" shall mean existing construction, existing improvements or existing construction.
- N. "New" shall mean "New material or product. Note that the word "New" is seldom used because all Work & materials are required to be new. "New" is typically used for clarification only on Plan sheets in limited applications that have both New & Existing work that might be confusing. Contractor shall assume that all work is new.
- O. Or Equal Clause: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," or "prior approved equal", only those products that were approved & listed in Addenda prior to Bid Time assure the supplier or contractor of product acceptance prior to Bids. Comply with Section 01 25 00 Product Substitution.
- P. System: All parts, materials or components as necessary for a complete functioning system. Include in Bid all Work necessary for the complete functioning system.
- Q. Ref: or Refer to: Shall mean to comply with this reference.
- R. As Required: Shall mean as required by Contract Documents or if specifics are not provided in Contract Documents, it shall mean as required for functionality in accordance with typically accepted practice.
- S. The terms "Owner" & "User Agency" are used interchangeably in the documents. If Owner approval is required, first check with the User Agency, then the Architect before the Owner.
- T. Buildable shall mean "capable of being constructed & functional".
- U. Bidder: Prime Contractor who submits a bid to Owner or Sub Bidder (sub-contractor or supplier) who submits quote
- V. SPECIFICATION EXPLANATIONS: These Specifications are of the abbreviated or streamlined type and include incomplete sentences. Omission of words or phrases such as "the Contractor shall," "in conformance with," "shall be," "as noted on the Drawings," "in accordance with Plans," "a," "an," "the," and "all" are intentional. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings. Words "shall be" or "shall" will be supplied by inference where colon (:) is used within sentences or phrases. The Contractor shall provide all items, articles, materials, operations or methods listed, mentioned or scheduled either on the Drawings or specified herein, or both, including all labor, materials, equipment, related items and incidentals necessary for a complete and workable job. Failure to mention a specific item necessary to make a complete and workable job will not relieve the Contractor from furnishing it.

Wherever the words "approved", "satisfactory", "directed", "submitted", "inspected", or similar words or phrases are used, it shall be assumed that the words "Architect or his representative" follows the verb as the subject of the clauses, such as "approved by the Architect or his representative".

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on CSI's 49-Division format and Master Format's numbering system.
- B. Related Documents: The following shall be added to all specification sections: under Part 1 General, add "The general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections are hereby made a part of this section."
- C. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
3. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
5. See Plans for list of Abbreviations. If an abbreviation is not listed in the plans or specifications, the standard in the Industry shall apply.

1.4 INDUSTRY STANDARDS

- A. Publication Dates: Comply with the latest adopted edition of the standards in effect as of the date of the Contract Documents.
- B. Conflicting Requirements: Where compliance with 2 or more standards is specified OR where 2 or more details are shown and the standards or details establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent, most expensive requirement. Refer to the Architect before proceeding for a decision on requirements that are different but apparently similar and where it is uncertain which requirement is the most stringent.
- C. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Co.'s "Encyclopedia of Associations," available in most libraries.

1.5 SUBMITTALS

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

- 1.6 INTERPRETATIONS: If any discrepancies or conflicts should arise in connection with any matter covered by the Contract Documents, the question shall be submitted to the Architect who shall decide which provisions shall control before work proceeds on the item in question. The Architect shall determine the amount, quality, acceptability and fitness of all materials and work under this Contract and shall decide the meaning and intent of any portion of the Contract Documents. In case any question shall arise between the parties hereto relative to said Contract or Specifications, the determination or decision of the Architect shall be a condition precedent to right of the Contractor to receive any money for payment for work under this Contract affected in any manner or to any extent by such questions. Where discrepancies occur in the Contract Documents, the more expensive work or larger number of materials shall prevail and be required. If no detail or a similar condition detail is indicated but required for completeness or functionality, contractor shall provide Industry Standard after confirmation with the architect.

Notwithstanding any other provisions in these Documents, the Architect shall be the sole judge of any conflict between Plans and Specifications, and all provisions in the Contract Documents and their intent. His interpretations and decisions shall be final.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 45 00 - DRAWINGS & SPECIFICATION CONVENTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition and Division 1 Specification Sections are hereby made a part of this section.

1.2 REVIEW OF DRAWINGS & SPECIFICATIONS (Applies to All Plan Sheets and All Specification Sections)

- A. General Contractor Review of Bid Documents: The General Contractor shall carefully review all of the plans & Project Manual Prior to Bids. Reliance on subcontractors & suppliers to include all the work indicated in the Bid Documents in their Bid is the General Contractor's prerogative. **The Owner shall not pay for changes that would have been avoided if the General Contractor reviewed all specification sections and drawings and advised the appropriate subcontractors of exclusions and inclusions prior to Bids.** If the General Contractor has any concerns about the plans or specifications, he shall notify the Architect at least 7 business days prior to bids. Bill@Land3.com 318-322-2694 ext.2
- B. Sub-contractor & Supplier Review of Bid Documents: Prior to bids, the sub-contractors & suppliers shall review the drawings and specifications and decide that no existing or proposed conditions prevent the contractor from performing the job in a professional manner. Should the contractor or supplier have suggestions, questions or need clarifications, he shall notify the Architect at least 7 business days prior to Bids. Bill@Land3.com 318-322- 2694 ext.2
- C. All sub-contractors and suppliers shall comply with Section 01 45 00 Drawings & Specification Conventions when estimating their cost prior to Bids.

1.3 DRAWING CONVENTIONS

- A. Drawing Convention of elements: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.
 - 3. "See Plans" or "See Plan Sheets" shall mean to comply with respective Plan Sheets.
 - 4. "Existing materials noted on plans & details refer to "existing" materials. All other materials noted on plans sheets and details shall be new.
 - 5. Similar line types and hatch fill represent similar Work to be performed.
- B. The drawings are organized in a comprehensive format to minimize the number of sheets so Work by multiple trades may be indicated on each sheet. It is the responsibility of the General Contractor to ensure that all work indicated on all sheets gets quoted at Bid Time. The drawings are to be used simultaneously with the specifications.
- C. Because of the small scale of the drawings to fit an entire building on a small sheet of plans, many of the plans and details are diagrammatic so the contractor must bring some common sense to the job and ask questions when not sure. Example: 4 Light switches are drawn about a foot apart on the electrical plan for clarity so that the switch symbols don't overlap over each other. But the switches are not intended to be separated by 3 feet each along the wall. Another example is water piping that is typically drawn a couple

of feet apart for clarity on a plan and to allow room for notes or symbols. The pipe shall be installed close together in the field..

1.4 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on CSI's 49-Division format and Master Format's numbering system.
- B. Related Documents: The following shall be added to all specification sections: under Part 1 General, add "The general provisions of the Contract, including General and Supplementary Conditions, Division 00 & 01 Sections & the Drawings are hereby made a part of this section."
- C. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - 3. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
 - 5. See Plans for list of Abbreviations. If an abbreviation is not listed in the plans or specifications, the standard in the Industry shall apply.
 - 6. Some Specification Sections may include a "Scope of Work", or "Work Included" or similar wording. This list is a partial list, abbreviated list of work and generalized. It is not all inclusive. The Work provided under this Section is not limited to this abbreviated list if the Work(materials or labor) is listed elsewhere in the spec section or shown on the plans.

1.5 INDUSTRY STANDARDS

- A. Publication Dates: Comply with the latest adopted edition of the standards in effect as of the date of the approval of the Contract Documents.
- B. Conflicting Requirements: Where compliance with 2 or more standards, references or details are indicated and any of these establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer to the Architect before proceeding for a decision on requirements that are different but apparently equal, and where it is uncertain which requirement is the most stringent.
- C. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Co.'s "Encyclopedia of Associations," available in most libraries.

1.6 PLAN OR DRAWING DISCREPANCIES

- A. Discrepancies on the drawings, between drawings & specifications or among themselves shall be called to the Architect's attention in writing at least 7 working days prior to Bid Date. If a request for clarification is not issued by contractor or supplier at least 7 working days prior to Bids and a response is not issued in an

addendum, the contractor or supplier shall provide of the more expensive scenario and obtain clarification during the course of the Project.

1.7 TYPOGRAPHICAL ERRORS

- A. A reference on plans to an incorrect Section number in the Project Manual by typographical error shall not relieve the contractor from providing the product altogether. Call the Architect and refer to another Section in the same Division if no similar Section exists. A reference on plans to an incorrect Detail Number shall not relieve the contractor from providing the Work altogether. Use another Detail on the same sheet referenced or Detail for similar type of work. A reference in the specifications to an incorrect Section number by typographical error shall not relieve the contractor from providing the Work altogether. Refer to another Section in the same Division and call the Architect if no similar Section exists.

1.8 MISSING DETAIL OR SPECIFICATION

If no construction detail or plan specification is indicated but required for completeness or functionality, contractor shall include in Bid the Industry Standard. After Bids receive confirmation from the architect.

1.9 MISSING SYMBOL

If a symbol is inadvertently missing adjacent to a piece of Electrical or Mechanical equipment or Plumbing fixture, contractor shall include in Bid the price of the nearest match and include all utilities to this fixture or equipment. Prior to submitting the shop drawings ask architect/engineer for clarification. Examples includes new plumbing fixture where a symbol is missing, contractor to use another restroom for similar symbol and piping. Where a light fixture is missing a symbol, use another nearby symbol of similar type and wiring. Where a piece of HVAC equipment is missing a symbol, use similar symbol for bidding purposes. If no other symbol is available, include in Bid cost of Industry Standard. After Bids, receive confirmation with the architect/engineer.

CHANGE ORDERS WILL NOT BE PAID BY THE OWNER FOR A MISSING SYMBOL WHEN COMMON SENSE COULD BE APPLIED AS NOTED ABOVE.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes requirements for:
1. Temporary services
 2. Temporary utilities
 3. Temporary Materials
 4. Temporary Project Site Sign (using template following this Section)
 5. Temporary security and protection.

1.3 QUALITY ASSURANCE

- A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
1. Building code requirements.
 2. Health and safety regulations.
 3. Utility company regulations.
 4. Police, fire department, and rescue squad rules.
 5. Environmental protection regulations.
 6. Owner regulations.
- B. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."
- C. Inspections & Testing: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.
- D. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines.

1.4 PROJECT CONDITIONS

- A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary safety and fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.
- B. Safety: Provide Barriers, protective covers, fencing as the contractor deems necessary to protect the safety of the building users and public. Maintain in a safe and efficient manner.

1.5 COST

- A. Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum. General Contractor shall allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner, Architect, testing agencies, and authorities having jurisdiction.
- B. Cost or use charges for temporary facilities are not chargeable to the Owner or Architect. Neither the Owner nor Architect will accept cost or use charges as a basis of claims for Change Orders. The contractor is responsible for all costs related to the installation, maintenance and use of temporary utility services.
- B. **Electric Power Service:** Temporary Electric power shall be provided by the **Owner** for use charges during construction activities. Provide connections and extensions of services as required for construction operations. Turn lights off at the end of every day. **CONTRACTOR MAY USE OWNERS POWER UNTIL THIS PRIVILEGE IS ABUSED.**

- D. **Water Service:** Temporary Water shall be provided by the Owner during construction activities. Turn water off at the end of every day. **CONTRACTOR MAYL USE OWNERS WATER UNTIL THIS PRIVILEGE IS ABUSED.**

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES & MATERIALS

- A. General: Provide new materials. If acceptable to the Architect, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended. Contractor shall provide all temporary materials as needed to protect the public and existing staff from danger as a result of this project.
- B. Protective Barrier Fencing: Furnish and install orange square mesh warning barrier fence except where other protective methods are indicated for pedestrian protection at perimeter of construction site.
- C. Construction Supply Trailers: Locate in Contractor Setup area or remote area designated by the User Agency.

2.2 EQUIPMENT

- A. General: Provide new equipment. If acceptable to the Architect, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.
- B. Water Hoses: Provide 3/4-inch (19-mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet (30m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
- C. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination, 10 fc minimum. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.
- F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.
- H. **Temporary Toilet Units:** Provide self-contained, single-occupant toilet units of the chemical, aerated re-circulation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- I. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by location and classes of fire exposures. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and do not remove until facilities are not needed or are replaced by authorized use of completed permanent ones.

3.2 ENVIRONMENTAL PROTECTION

- A. Environmental Protection: Provide protection, operate temporary facilities and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 01 10 00 "Summary of Work."
- B. Temporary Erosion and Sedimentation Control: Comply with requirements of latest EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent and requirements specified in Division 31.
- C. Temporary Erosion and Sedimentation Control: If no details are indicated in Drawings, provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
 - 1. Inspect, repair and maintain erosion and sedimentation-control measures during construction until permanent vegetation has been established.
 - 2. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
 - 3. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains as indicated on plans.

3.3 MOISTURE AND MOLD CONTROL

- A. Moisture-Protection Plan: Avoid trapping water in finished work. General Contractor shall document all visible signs of mold that may appear during construction.
- B. Exposed Construction: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.
 - 3. Periodically collect and remove waste containing cellulose or other organic matter.
 - 4. Discard or replace water-damaged material.
 - 5. Do not install material that is wet.
 - 6. Discard, replace, or clean stored or installed material that begins to grow mold.
 - 7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

END OF SECTION

HODGE WATSON ROAD IMPROVEMENTS - PHASE 1

Funded by **West Ouachita Economic Development District**
For the **Ouachita Parish Police Jury**



Toni Bacon, District A
Jimmy Tyson, District B
Larry Bratton, District C

Michael Thompson, District D
President Shane Smiley, District E
Lonnie Hudson, District F

CONSTRUCTION COST: \$671,013.49

CONTRACTOR: AMETHYST CONSTRUCTION, INC.

ENGINEER: LAZENBY & ASSOCIATES, INC.

SECTION 01 60 00 - PRODUCT REQUIREMENTS**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes the following administrative and procedural requirements: selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.
- B. Related Sections include the following:
1. Section 01 23 00 "Alternates" for products selected under an alternate.
 2. Section 01 25 00 "Product Substitution" for requests for substitutions.
 3. Section 01 33 00 "Submittal Procedures" for shop drawing submittals.
 4. Section 01 77 00 "Closeout Procedures" for warranty submittals.

1.3 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, which is current as of date of the Contract Documents.
 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products unless containing recycled content specifically requested for sustainable design.
 3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers, the product is not intended to limit the number of manufacturers but to establish the quality of design. However, the Contractor shall provide all other Work that may be required by the Equal manufacturers for compliance with the requirements of the specification.

1.4 SUBMITTALS

- A. Submit product information to Architect in accordance with Section 01 33 00 "Submittal Procedures".
- B. Submit Substitution Request to Architect in accordance with Section 01 25 00 "Product Substitution".

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery & Handling:
 - 1. Coordinate delivery with installation time to ensure minimum holding time at Project site for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 2. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 3. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- D. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT RETURNS

- A. Returns shall be allowed regardless of local vendor policy for all undamaged products after removal from carton but prior to installation. A maximum of 15% shall be allowed for re-stocking cost.

1.8 WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval with Shop Drawings to Architect.
 - 1. Specified Form: Forms are included with the Specifications. Prepare a written document using appropriate form properly executed.
 - 2. Refer to Divisions 2 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.
 - 3. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to:
 - 1. Extend time limit provided by manufacturer's warranty
 - 2. Provide installer's warranty
 - 3. Provide more rights for Owner.
- C. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- D. Submittal Time: Submit Final Warranty prior to Substantial Completion to avoid inclusion on the Costed Punch List with a value to withhold from payment to Contractor. Comply with requirements in Division 1 Section 01 77 00 "Closeout Procedures."

1.9 PRODUCT REQUIREMENTS

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available and unless custom products or nonstandard options are specified,

provide standard products of types that have been produced and used successfully in similar situations on other projects.

3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
 6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
- B. Product Selection Procedures: Procedures for product selection include the following:
1. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
 - a. Substitutions may be considered in accordance with "Product Substitutions" Section 01 25 00.
 2. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
 - a. Substitutions may be considered in accordance with "Product Substitutions" Section 01 25 00.
 3. Product Options: Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product listed as an equal. Comply with provisions in "Product Substitutions" Section 01 25 00
 4. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Products" are included and also introduce or refer to a list of manufacturers' names, provide either the specified product or a comparable product by one of the other named manufacturers. Comply with provisions in "Product Substitutions" Section 01 25 00. Drawings and Specifications indicate sizes, profiles, dimensions and other characteristics that are based on the product named. Comply with provisions in "Product Substitutions" Section 01 25 00.

1.10 APPROVED EQUALS (Bidding Process)

- A. Requests for Prior Approval shall be made in strict accordance with requirements set forth in the Instructions to Bidders and Section 01 25 00.
- B. Architect may request the submission of product samples during the bidding process before making a decision for prior approval of a certain product or material.
- C. Or Equal Clause: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," or "prior approved equal", the products may be submitted for approval prior to bidding, prior to ordering and after bidding in accordance with Section 01 25 00 Product Substitution & LA Bid Law.

1.11 PRODUCT AVAILABILITY

- A. The Architect recognizes that companies discontinue product lines and that product model numbers change frequently. It is the Design Intent for the Supplier to use the same company's comparable product or upgrade for those product model numbers that are discontinued or changed prior to Bids or during construction. An incorrect or outdated model number shall not relieve the contractor from providing a similar product. The Supplier or Contractor shall advise the architect a minimum of 7 days prior to bids of any known model number changes or discontinued products.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 73 00 - EXECUTION
(Including User Agency provided materials)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions, and Division 1 specification sections are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of the Work.
 - 4. Coordination of User Agency installed products.
 - 5. Progress Waste & Cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the Work.

1.3 RELATED REQUIREMENTS

- A. Section 01 10 00 "Summary of Work" for limits on use of Project site.
- B. Section 01 33 00 "Submittal Procedures" for submitting surveys.
- C. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.4 QUALITY ASSURANCE

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
 - 3. Verify all existing utilities including telecommunications that need to maintain
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services. Include in Bid cost to find and locate utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Examination & Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - a. Description of the Work.
 - b. List of detrimental conditions, including substrates.
 - c. List of unacceptable installation tolerances.
 - d. Recommended corrections.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before or materials. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.
- E. Surface and Substrate Preparation: Comply with manufacturer's written recommendations for preparation of substrates to receive subsequent work.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 3. Establish limits of Project site use areas.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

- E. Wall Lines: Dimensions on plans are generated by the computer and rounded off to the nearest 1/8". Should there be a conflict in the dimensions greater than 1/2", contact architect for clarification or to learn if the variable is not an issue.

3.4 FIELD ENGINEERING

- A. Identification: Owner will identify existing benchmarks, control points, and property corners.
- B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

3.5 EQUIPMENT REVIEW

- A. Review equipment submittals with sub-contractors and suppliers and note any required clearances for maintenance, servicing, utility connections or size increase. Advise Architect of any recommended adjustments to the existing planned spaces as soon as possible but not later than "rough-in" phase.

3.6 GENERAL INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 8 feet (2.4 m) in spaces without a suspended ceiling.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral

anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.7 **USER AGENCY INSTALLED PRODUCTS**

- A. Site Access: Provide access to Project site for Owner's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
 - 1. Construction Schedule: Inform User Agency of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify User Agency if changes to schedule are required due to differences in actual construction progress.
 - 2. Pre-installation Conferences: Include User Agency's construction forces at pre-installation conferences covering portions of the Work that are to receive User Agency's work. Attend pre-installation conferences conducted by User Agency's construction forces if portions of the Work depend on User Agency's construction.

3. **The User-Agency shall furnish & install the following items:**

- 1. Furniture not already in the building at time of Pre-Bid.
- 2. Appliances not listed on Plans Sheet A2.1A.
- 3. Flat screen TVs
- 4. Access Control System Computer/Equipment(Area 135), card readers, keypads where shown on plans require the junction box.
- 5. Security Camera System
- 6. Communication/Telephone Systems

Note: Conduit and low voltage wiring for the above may be included in plans where shown.

- C. The Work includes providing support systems to receive User-Agency's equipment and electrical connections.
 - 1. The User Agency will arrange and pay for delivery of User Agency furnished items according to the Contractor's Construction Schedule.
 - 2. Following delivery, the User Agency will inspect for damage the items delivered.
 - 3. If User Agency furnished items are damaged, defective or missing, the User Agency will arrange for replacement.
 - 4. The Contractor is responsible for protecting the User Agency furnished items from damage by its trade contractors during the construction period. The Contractor shall repair or replace items damaged as a result of his operations.

3.8 **PROGRESS WASTE & CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
 - E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
 - F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
 - G. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
 - H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
 - I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
 - J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

3.11 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 01 73 29 - CUTTING, PATCHING AND SLEEVING**PART 1 - GENERAL**

1.1 SUMMARY

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.
- B. This Section includes procedural requirements for cutting, patching and sleeving.
- C. See Divisions 2 through 33 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1.2 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio without adequate shoring.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
- C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching of a finish material. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required and with disturbance of adjacent surfaces. Temporarily cover openings when not in use.

2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 5. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing and closing up with materials similar to existing adjacent materials. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections. See Plans for Details.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
- D. Sleeving: Provide jacket or sleeve around all piping and conduit penetrations thru concrete foundation or structure. If not indicated elsewhere, sleeve material shall be Sch. 40 PVC. Use foam sealant around annular space for water & air tightness.
1. Inspection: Where feasible, inspect sleeved areas after completion to demonstrate protection of sleeved pipe.
- E. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements that are supplemental to the requirements of the General & Supplementary Conditions of the Contract for contract closeout, including, but not limited to, the following:
 1. Substantial Completion procedures.
 2. Final completion procedures.
 3. Warranties.
 4. Final cleaning.
 5. Repair of the Work.

1.3 RELATED SECTIONS:

- A. Related Requirements:
 1. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 2. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 3. Section 01 79 00 "Demonstration and Training" for requirements for instructing Owner's personnel.
 4. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.4 SUBSTANTIAL COMPLETION PROCEDURES

- A. General & Supplementary Conditions of the Contract: Comply with the requirements of the General Conditions of the Contract and the Supplementary Conditions.

1.5 FINAL COMPLETION PROCEDURES

- A. General & Supplementary Conditions of the Contract: Comply with the requirements of the General Conditions of the Contract and the Supplementary Conditions.

1.6 SUBMITTALS

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

1.7 SUBMITTAL OF PROJECT WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

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

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

- 3.1 FINAL CLEANING
 - A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- 3.2 REPAIR OF THE WORK
 - A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- 3.3 TRAINING AND REFERENCE MATERIAL: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

END OF SECTION

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. Section includes requirements for preparing operation and maintenance manuals, including the following:
 1. Operation and maintenance documentation directory.
 2. Operation manuals for systems, subsystems, and equipment.
 3. Product maintenance manuals.
 4. Systems and equipment maintenance manuals.

1.3 RELATED SECTIONS

- A. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 1. Architect will advise on whether content of operations and maintenance submittals are acceptable.
 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 1. PDF electronic file- 3 copies. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - a. Same information as paper copy.
 2. Two paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.
- C. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 20 days before commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Architect.
 7. Name and contact information for Architect's engineering consultants.
 8. Cross-reference to related systems in other operation and maintenance manuals.

- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Paper & Electronic Files: Submit 3 manuals in printed form and 3 PDF files (DVD) for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit 3 manuals in the form of hard copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 - 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 - 4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
 - 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate section for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

END OF SECTION

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
1. Record Drawings.
 2. Record Specifications.

1.3 RELATED SECTIONS

1. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
2. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Divisions 2 through 33 Sections for specific requirements for Project Record Documents of the Work in those Sections.

1.4 SUBMITTALS

- A. Record Drawings: Comply with the following:
1. Number of Copies: Submit one set(s) of marked-up Record Prints for review by the Architect for completeness.
- B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications for completeness.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Print & maintain one set of black-line white prints of the Contract Drawings and Shop Drawings incorporating new and revised Drawings as modifications are issued.
1. Preparation: Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 2. Mark the Contract Drawings or Shop Drawings, completely and accurately. If Shop Drawings are marked, show cross- reference on the Contract Drawings.
 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 4. Mark important additional information that was either shown schematically or omitted from original Drawings.
 5. Note alternate numbers, Change Order numbers, and similar identification, where applicable.
 6. Upon review by the Architect with the Contractor for compliance with stated requirements and completeness the Architect will approve Record Prints and Record Specifications or return them to the Contractor for further drawing clarification or written information. Refer any instances of uncertainty to the Architect for resolution. When all matters have been resolved and noted on the Record Prints of the Contractor, the Contractor shall submit the prints to the Architect using the Contractors standard

transmittal form stating their content and purpose. Record Prints and Specification shall not be considered complete until written approval by the Architect is given.

7. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to routing of piping and conduits.
 - c. Revisions to electrical circuitry.
 - d. Actual equipment locations.
 - e. Field records for variable and concealed conditions.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Print & mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
 5. Note related Change Orders and Record Drawings where applicable.
 6. Submit specifications to the Architect for his review for completeness of the stated requirements.

2.3 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Make changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours. Review with Architect at each Monthly Meeting.

END OF SECTION

SECTION 01 79 00 - DEMONSTRATION AND TRAINING**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
1. Demonstration of operation of systems, subsystems, and equipment.
 2. Training in operation and maintenance of systems, subsystems, and equipment.

1.3 OBJECTIVE

- A. Objective: Develop a learning objective and teaching outline for each session. Include description of specific skills and knowledge that participant is expected to master. For each session, session, include instruction for the following:
1. Basis of System Design, Operational Requirements, and Criteria: Include system and equipment descriptions, operating standards, regulatory requirements, equipment function, operating characteristics, limiting conditions, and performance curves.
 2. Documentation: Review operations and maintenance manuals; Project Record Documents; identification systems; warranties and bonds; and maintenance service agreements.
 3. Emergencies: Include instructions on stopping; shutdown instructions; operating instructions for conditions outside normal operating limits; instructions on meaning of warnings, trouble indications, and error messages; and required sequences for electric or electronic systems.
 4. Operations: Include startup, break-in, control, and safety procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; operating procedures for emergencies and equipment failure; and required sequences for electric or electronic systems.
 5. Adjustments: Include alignments and checking, noise, vibration, economy and efficiency adjustments.
 6. Troubleshooting: Include diagnostic instructions and test and inspection procedures.
 7. Maintenance: Include inspection procedures, types of cleaning agents, methods of cleaning, procedures for preventive and routine maintenance, and instruction on use of special tools.
 8. Repairs: Include diagnosis, repair, and disassembly instructions; instructions for identifying parts; and review of spare parts needed for operation and maintenance.

1.4 SUBMITTALS

- A. Instruction Program: Submit instructional program for demonstration and training, including a list of training sessions and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training session. Include learning objective and outline for each training session.
1. At completion of training, submit three complete sets of training manuals for Owner's use.
- B. Attendance Record: For each training session, submit list of attendees and length of instruction time.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training sessions with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS**2.1 INSTRUCTION PROGRAM**

- A. Program Structure: Develop an instruction program for each system and for equipment not part of a system, as required by individual Division Sections as follows:
1. Division 21 & 22 components including fixture faucets and controls, electric water heaters.
 2. Division 23 components including HVAC systems, VFV condensing units, including air-handling equipment air distribution systems and terminal equipment and devices. HVAC instrumentation and controls.
 3. Division 26 components including electrical service and distribution, including transformers switchboards panelboards uninterruptible power supplies, motor controls, packaged engine generators, including transfer switches, lighting equipment and controls, Lightning Protection..
- B. Training Sessions: Develop a learning objective and teaching outline for each session. Include a description of specific skills and knowledge that participant is expected to master. For each session, include instruction for the following as applicable to the system, equipment, or component:
1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.

5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training session. Assemble training sessions into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."

3.2 INSTRUCTION

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 1. Owner will describe Owner's operational philosophy.
 2. Owner will furnish Contractor with names and positions of participants.
- B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
- C. Evaluation: At conclusion of each training session, assess and document each participant's mastery of session by use of a demonstration performance-based test
 1. Schedule training with Owner, through Architect, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Evaluation: At conclusion of each training session, assess and document each participant's mastery of session by use of a demonstration performance-based test.
- F. Cleanup: Collect used and leftover educational materials and remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION

SECTION 02 30 00 - SUB-SURFACE INVESTIGATION REPORT (SOIL REPORT)

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.02 SCOPE

1. The Soil Report is included as part of these Contract Documents immediately following this page.
2. If any discrepancies between Contract Plans and this report are found, Contractor to immediately notify the Architect. This report will govern over Contract Plans and Specifications in the event of an undiscovered discrepancy. Where the Plans specifically indicate more undercut or fill material depth or more stringent or more expensive requirement than the soil report, the plans shall prevail as the Soil Report is a minimum requirement. The design may exceed that minimum requirement. Plan notes reading “refer to soil report or comply with soil report” are meant for all other criteria except for fill material depth when the plans specifically indicate a depth greater than that required by the soil report.
3. During the course of excavation should the contractor and/or subcontractor uncover and identify substrates unlike those identified in the soil investigation work in the affected area shall cease and the contractor shall notify the Architect of the discrepancy.
4. Refer to Section 01 40 00 Quality Requirements for additional requirements.

PART 2 – Not Used

PART 3 – Not Used



GEOTECHNICAL EXPLORATION

**PROPOSED OUACHITA PARISH MAIN LIBRARY
ARCHWAY
MONROE, LOUISIANA
FILE NO. G24-01-011**

Prepared for

**GLOBAL LABORATORIES
105 PARKWEST DRIVE
WEST MONROE, LOUISIANA 71291**

GOLDMAN GEOTECHNICAL CONSULTING, LLC

February 16, 2024

Mr. Jimmy Kent
Global Laboratories
105 Parkwest Drive
West Monroe, Louisiana 71291

RE: Geotechnical Exploration
Proposed Ouachita Parish Main Library Archway
Monroe, Louisiana
File No. G24-01-011

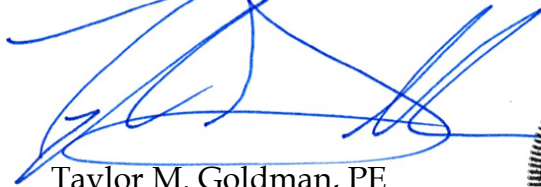
Dear Mr. Kent:

This office is pleased to transmit our geotechnical engineering services report for the above referenced project. The attached report presents the results of site investigations, laboratory testing, and engineering analysis and recommendations.

We appreciate the opportunity to provide our services to you and look forward to serving as your geotechnical consultant throughout this project. Please do not hesitate to contact this office if you have any questions regarding the information presented or if we may be of further service.

Sincerely,

Goldman Geotechnical Consulting, LLC



Taylor M. Goldman, PE
Member/Manager



**GEOTECHNICAL EXPLORATION
PROPOSED OUACHITA PARISH MAIN LIBRARY ARCHWAY
MONROE, LOUISIANA**

PROJECT DESCRIPTION

This report presents the results of the geotechnical exploration performed for a proposed archway addition to the proposed Ouachita Parish Library in Monroe, Louisiana. The library is anticipated to be established in a currently abandoned Stein Mart store located at 1000 Oliver Road. The archway is anticipated to be constructed at the entrance on the southwestern face of the building. The general construction area and associated boring location are indicated on the attached Boring Location Diagram. The site topography is relatively flat possibly with one (1) foot of elevation relief to the south and west. The proposed construction area is paved with Portland cement concrete and possibly asphaltic concrete depending on the limits of the construction area.

The project is anticipated to consist of construction of an entry archway constructed with masonry walls. Anticipated wall loads will be on the order of two and a half (2.5) kips per linear foot with maximum isolated column loads on the order of fifteen (15) kips. Existing and final elevations were not provided at the time of field operations. However, based on site topography and visual observations, it is anticipated that the final finished grade will be established at the existing grades at the time of the field operations.

GENERAL

The study was authorized by Global Laboratories via email on January 29, 2024. The purpose of the investigation was to evaluate the general subsurface conditions and develop recommendations for the safe and economical design of the foundation system(s) of the proposed structure and subgrade preparation for the construction. The study included drilling sample borings, performing laboratory testing, and engineering analysis of the subsurface conditions. The field and laboratory investigations included in this report have been conducted in accordance with applicable standards and procedures set forth in ASTM Standards.

FIELD OPERATIONS

The subsurface conditions were evaluated by advancing one (1) sample boring on February 7, 2024. The approximate location of the boring is indicated on the attached Boring Location Diagram. The depth and location of the boring performed were specified by the design professional. The boring location was staked in the field by representatives of this office based on a site plan provided to this office. Descriptive terms and symbols used on the boring log are in accordance with the Unified Soil Classification System. Surface elevation at the borehole location was not supplied prior to field operations.

A truck mounted auger drill rig was used to advance the test boring. Intermittent undisturbed samples were obtained in the following manner. Standard penetration tests were performed in accordance with ASTM procedures. This test is conducted

by recording the number of blows required for a one hundred forty (140) pound hammer falling thirty (30) inches to drive a split spoon sampler eighteen (18) inches into the substrata. Depths at which split spoon samples were taken are indicated by two (2) crossed lines in the "Samples" column on the Log of Boring. The number of blows required to drive the sampler for each 6-inch increment were recorded. The penetration resistance is the number of blows required to drive the split spoon sampler the final twelve (12) inches of penetration. Information related to the penetration resistance is presented under the "Field Data" head of the Log of Boring. All samples were extruded in the field, sealed to maintain in-situ conditions, and packaged for transport to the laboratory for additional testing.

Water observations were recorded during the drilling operations and again in the open borehole upon completion of the field services to evaluate groundwater conditions. The boring was backfilled and patched with concrete at completion of the field operations.

LABORATORY TESTING

Upon return to the laboratory all samples were visually logged in accordance with the Unified Soils Classification System. Selected samples were subjected to standard laboratory tests under the supervision of a geotechnical engineer to verify classification and to determine pertinent engineering properties of the substrata. The results of laboratory testing and soil classifications are tabulated on the attached Logs of Boring. Samples obtained during our field studies and not consumed by laboratory

testing procedures will be retained for a period of thirty (30) days. Arrangements for storage beyond that period must be made in writing to this office.

SUBSURFACE CONDITIONS

The sidewalk pavement encountered in the soil boring was comprised of approximately four (4) inches of Portland cement concrete (PCC) over two (2) inches of crushed stone base material. The subsurface stratigraphy of the site is comprised of two (2) generalized strata. The initial stratum directly beneath the pavement consists of stiff to medium stiff gray and tan silty lean clay to approximately twelve (12) feet depth. The silty lean clay exhibits low plasticity, moderate to low shear strength, and moderate to high compressibility. The silty lean clay stratum is underlain by soft dark gray fat clay to the thirty (30) feet termination depth. The fat clay soils exhibit moderately high to high plasticity, very low to low shear strength, and high compressibility. Additionally, the fat clay soils are classified as volumetrically unstable, possessing moderately high to high susceptibility to shrink and swell with variations in moisture content.

The subsurface description provided in this section is of a generalized nature to highlight the major stratification features and material characteristics. For a detailed description of the subsoil, refer to the soil profile located on the attached Log of Boring.

Subsurface water was encountered in the boring at approximately thirteen (13) feet depth during drilling operations. Upon completion of the field operations, the water level was measured and recorded at nine (9) feet upon completion. The boring walls of boring B-1 collapsed at twenty-seven (27) feet depth upon completion of the drilling operations. Based on site topography, subsurface stratigraphy, and anticipated construction techniques required for this project, groundwater is not anticipated to present any significant problems during the construction phase of the project. However, the depth of perched water and shallow groundwater is influenced by seasonal moisture variations in the climatic cycle. Consequently, the depth to shallow subsurface water should be verified prior to the start of construction of the project.

SEISMIC DESIGN CONSIDERATIONS

The International Building Code, 2021 edition requires the design of structures must consider dynamic forces resulting from seismic events. These forces are dependent upon the magnitude of the earthquake event as well as the properties of the soils that underlie the site. As part of the procedure to evaluate seismic forces, the code requires the evaluation of the Seismic Site Class, which categorizes the site based upon the characteristic of the subsurface profile within the upper 100 feet of the ground surface.

To define the Site Class for this project, we have interpreted the results of the test borings drilled within the project site and estimated appropriate soil properties below the base of the borings to a depth of 100 feet as permitted by the code. The estimated

soil properties were based upon our experience with subsurface conditions in the general site area. Based upon this evaluation, the subsurface conditions within the site are consistent with the characteristics of a Site Class "D" (stiff soil profile) as defined in Table 1613.5.2 of the building code.

ANALYSIS AND RECOMMENDATIONS

Shallow Foundations

Based on the site topography and visual observations, it is anticipated that site grading for the proposed structure will be minimal. Therefore, with the analysis of the field and laboratory program and potential site grading, a shallow foundation system may be utilized for support of the proposed structure. Any necessary select fill material should meet the general requirements for type and placement as stated in the Site Preparation section of this report and should extend a minimum of five (5) feet beyond the edge of the slabs. Additionally, the building pad should either be cut as necessary to place a uniform thickness of select fill material if fill material is necessary. Either continuous footings and/or isolated spread footings are feasible for this site. The base of the footings should be placed in properly prepared in-situ silty lean clay or select fill material as per the Site Preparation section of this report at a minimum depth of approximately eighteen (18) inches to two (2) feet below the final adjacent grade.

Allowable bearing pressures of 2500 psf may be utilized for foundations bearing in the upper three and a half (3.5) feet of the soil boring and 2000 psf for foundations

bearing between four (4) and six (6) feet depth can be used for the design of continuous footings. The bearing values contain a factor of safety on the order of two (2). A minimum footing width of eighteen (18) inches should be maintained for all steel reinforced continuous footings as protection against isolated shear failure.

Isolated spread footings may be considered for support of interior columns or other areas of concentrated load. The base of the spread footings should be placed in the previously described strata. Allowable pressures of 2900 psf can be used to proportion all spread footings bearing in the upper three and a half (3.5) feet and 2300 psf for spread footings bearing between four (4) and six (6) feet. The bearing values contains a factor of safety on the order of two (2). All spread footings should be designed with a minimum base width of twenty-four (24) inches.

Resistance to uplift will be provided by the weight of soil above the proposed foundation elements. The in-place unit weight of the anticipated compacted select fill material is approximately 120 to 125 pcf, and the unit weight of the anticipated compacted in-situ silty lean clay soils ranges between approximately 115 pcf to 120 pcf.

The base of all foundation excavations should be free of water and loose soil prior to placing concrete. The concrete should be placed as soon as possible after excavation to minimize bearing soil disturbance. Should the soils at the bearing elevation become excessively dry, disturbed, or saturated, the affected soils should

be removed prior to concrete placement. Prior to placement of any select fill the subgrade should be prepared as specified in the Site Preparation section of this report. Care should be taken to shape the site such that water does not pond around the structure during construction. When the structure is complete, the ground surface should slope away from the structure and all roof runoff should be collected in a gutter system and piped away from the structure, preferably onto paved areas or into subsurface drainage systems before discharging.

Shallow Foundation System Improvement

If desired, a form of ground improvements, such as a system of Rammed Aggregate Piers (RAP), may be considered if the bearing capacity requires improvement. The design of this type of ground improvement system is typically performance based and proprietary to a specialty design-build contractor, such as Geopier®. RAP systems can be a cost-effective foundation solution to support settlement sensitive structures while providing an increased allowable bearing capacity. The ramming process used in Geopier® systems increases the lateral stress in surrounding soils, theoretically resulting in stiffening the stabilized composite soil mass. RAP elements have been utilized to reinforce good to poor soils. Engineers, such as those at Geopier®, would evaluate the site based on the field and laboratory test data provided in this report and their experience working with similar subsurface stratigraphy. With this information, a recommended bearing capacity for shallow foundations constructed on a RAP system will be provided. GGC does not warranty the design of a potential RAP

system and is only recommending this be considered as a potentially viable method of increasing allowable bearing capacity at this site, if necessary.

Deep Foundations

If foundation loads become too significant or construction techniques become too stringent for shallow foundations to be feasible, the foundation loads may be supported by a deep foundation system. Due to the relatively shallow groundwater elevation the typical deep foundation system of drilled and cast-in-place concrete piers may not be feasible. Consequently, it is recommended that helical foundation piers be considered. Helical piers can be relatively easily installed with limited access, and the amount of spoils produced during the installation process should be minimal. Additionally, the presence of shallow groundwater is not a limitation concerning the installation of the piers.

The helical pier foundation system should be designed by a professional engineer experienced in helical pier design and installed by an experienced contractor. Helical piers manufactured from galvanized steel should be utilized to prevent corrosion. With helical pier foundations elements, lateral resistance is generally achieved through depth and multiple piers. Alternatively, greater lateral and/or uplift resistance, as well as vertical load resistance, may be provided by utilizing grout around each pile. The design depths shall be provided by the design professional to achieve the necessary load resistance capabilities. We recommend that load tests be performed on helical

piers of equivalent size and embedment as the designed production element to verify or determine the single pile load capacity.

Alternatively, provided in the following table are allowable loads for various diameter drilled and cast-in-place concrete piers for deep foundation consideration, if necessary. The depths provided are the minimum shaft lengths below the ground elevation at the time of the geotechnical investigation.

Diameter (inches)	Depth (feet)	Allowable Loads (kips)
12	10	6
18	10	9
24	10	13
30	10	17
36	10	21
42	10	26
48	10	31

The bearing values provided contain a factor of safety on the order of two (2). Casing of the shafts should not be required to install the piers to the depth indicated, especially if installed during a dry period of the climatic cycle. However, the depth of shallow groundwater varies throughout the year for multiple reasons. Consequently, it is recommended that the depth of the groundwater be established prior to installation commencing. All pier excavations should be essentially dry and clean

prior to concrete placement. Concrete should not be placed by dropping from the concrete truck chute into pier excavations with more than about three (3) inches of water present in the bottom. Limited seepage into drilled pier excavations can probably be controlled by close coordination of drilling, cleanup, and concrete placement. However, if pier excavations cannot be dewatered through pumping or other means, underwater concrete placement techniques may be warranted. Consequently, it is recommended that a test shaft be drilled and installed prior to construction to establish an installation procedure. All test shafts should be of a similar size to the production piers.

SITE PREPARATION

Site preparation should begin with the removal of the existing pavement and any necessary existing structural element within the construction area. A stripping depth on the order of six (6) inches below the existing grades is anticipated to remove the existing pavements. Additional excavation and backfill is possible due to the removal of any foundation elements if any structural elements are to be removed for the proposed construction and may be warranted due to soft strata and/or for buried foreign debris. Once all deleterious matter has been removed, provide drainage of the exposed subgrade by sloping grades and ditching.

Following stripping and cutting and prior to any necessary fill placement, the exposed surface of areas to receive fill material or bear foundation elements should be scarified to a minimum of twelve (12) inches and compacted to a minimum of ninety-

five (95) percent of the maximum dry density determined by ASTM D-698. The moisture content of the in-situ silty lean clay should be adjusted and maintained between two (2) percent below and two (2) percent above optimum.

Succeeding moisture and density controlling, the subgrade should be proof-rolled with a loaded tandem-wheel dump truck or equivalent equipment. Proof-rolling should be observed by a representative of the qualified construction materials testing laboratory to verify stable subgrade conditions. All soft or loose soils should be undercut, stabilized, processed, and recompact or excavated and replaced with select fill, whichever is appropriate. It should be noted that the removal of the existing concrete pavement may reveal soils more saturated than indicated in the soil borings. The existing concrete generally prevents or restricts moisture accumulated in the upper soils from the possible rise of groundwater tables through capillary rise and thermal action to exit the soils and can accumulate over time. Consequently, the in-situ soils may require drying efforts including disking and turning the soils multiple times prior to compaction to achieve the necessary moisture content range.

Place any necessary select fill in thin, essentially horizontal layers not exceeding eight (8) inches in loose thickness and compact to a minimum of ninety-five (95) percent of the maximum density established by ASTM D-698 and moisture content adjusted and maintained to within two (2) percent below to three (3) percent above optimum moisture. All select fill should be sandy clay or clayey sand possessing a liquid limit no greater than thirty-five (35), a plasticity index ranging between five (5) and

eighteen (18), and not greater than sixty-five (65) percent passing the No. 200 mesh sieve. Soils possessing a plasticity index less than five (5) or a percent passing the No. 200 sieve greater than sixty-five (65) shall not be utilized as structural fill at this site, without prior approval from the Geotechnical Engineer and/or Structural Engineer.

LIMITATIONS

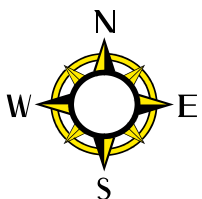
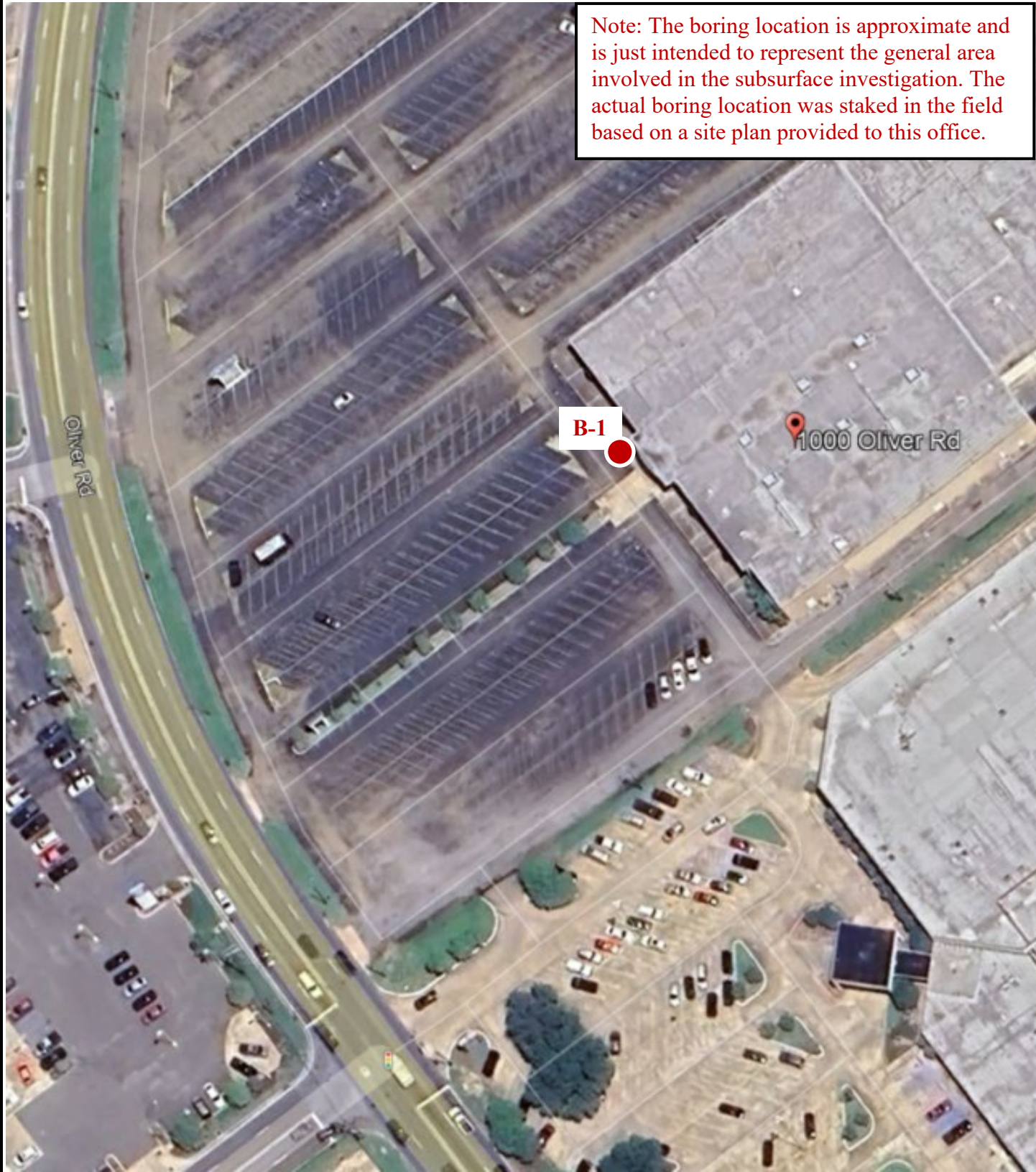
The analysis and recommendations presented in this report are based upon the data obtained from the boring performed at the indicated location and from any other information discussed in the report. This report does not reflect any variations, which may occur across the site. The nature and extent of such variations may not become evident until construction. If variations appear evident it will be necessary to reevaluate the recommendations of this report.

It is recommended the Geotechnical Engineer be given the opportunity to review the plans and specifications so comments can be made regarding the interpretation and implementation of our geotechnical recommendations in the design and specifications. Sound engineering judgement must be followed when applying the recommendations to designs, plans, and during construction monitoring.

This report has been prepared for the exclusive use of our client for specific applications to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either

expressed or implied, are intended or made. In the event any changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and the conclusions of this report are verified in writing by the Geotechnical Engineer.

Note: The boring location is approximate and is just intended to represent the general area involved in the subsurface investigation. The actual boring location was staked in the field based on a site plan provided to this office.



**BORING LOCATION DIAGRAM
PROPOSED OUACHITA PARISH MAIN LIBRARY
ARCHWAY ADDITION
MONROE, LOUISIANA**

February 15, 2024

Project: G24-01-011

LOG OF BORING B-1

Goldman Geotechnical Consulting, LLC
3841 Industrial Circle, Suite 100
Bossier City, Louisiana 71112
Telephone: (318) 459-6696

CLIENT: Global Laboratories
 PROJECT: Ouachita Parish Main Library Archway
 LOCATION: Monroe, Louisiana
 NUMBER: G24-01-011

DATE(S) DRILLED: 2/7/24

DRILLING METHOD(S):

Continuous Flight Auger

GROUNDWATER INFORMATION:

Groundwater encountered at 13 ft during drilling operations.
 Water level recorded at 9 ft upon completion.
 Borehole walls collapsed at 27 ft.

SURFACE ELEVATION: Unknown

DESCRIPTION OF STRATUM

4" Portland cement concrete
 2" Crushed stone (Base Material)
 Stiff gray and tan silty lean clay (CL)

91

-- Medium stiff below 5 ft

95

Soft dark gray fat clay (CH)

100

Boring Terminated 30 ft

LOG A GNNL01 - LOG A GNNL01.GDT - 2/15/24 16:16 - C:\USER\STGOLD\ONEDRIVE\DESKTOP\IGGC REPORTS\GIN\TG24-01-011 OUACHITA PARISH MAIN LIBRARY ARCHWAY.GPJ

SOIL SYMBOL	FIELD DATA				LABORATORY DATA							
	DEPTH (FT)	SAMPLES	N: BLOWS/FT P: TONS/SQ FT T: BLOWS R: % RQD: %	MOISTURE CONTENT (%)	ATTERBERG LIMITS			DRY DENSITY POUNDS/CU FT	COMPRESSIVE STRENGTH (TONS/SQ FT)	FAILURE STRAIN (%)	CONFINING PRESSURE (POUNDS/SQ IN)	MINUS NO. 200 SIEVE (%)
					LL	PL	PI					
5	N = 10	17	27	16	11							
	N = 9	21	28	18	10						91	
	N = 5	24	28	18	10							
10	N = 4	28									95	
	N = 3	39										
15	N = 2	43	63	29	34							
20	N = 2	69									100	
25	N = 2	73	74	34	40							
30												

N - STANDARD PENETRATION TEST RESISTANCE
 P - POCKET PENETROMETER RESISTANCE
 T - TXDOT CONE PENETRATION RESISTANCE
 R - ROCK CORE RECOVERY
 RQD - ROCK QUALITY DESIGNATION

REMARKS:

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		CLEAN SANDS (LITTLE OR NO FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SC	CLAYEY SANDS, SAND - CLAY MIXTURES
	FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
			CH	INORGANIC CLAYS OF HIGH PLASTICITY	
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

SECTION 02 41 13 – SELECTIVE SITE DEMOLITION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section

1.2 SUMMARY

- A. Demolition work shall consist of removing vegetation, trees, fencing, paving, utilities, miscellaneous site items and legal disposal of demolished materials; and providing the owner with items intended for salvage.
- B. The extent of demolition work shall be limited to those items described on the plans and include demolition required to properly furnish and install all construction items illustrated in the drawings and specified herein whether the particular item is specifically indicated on the Demolition Plans.
- C. Provide and coordinate location and installation of temporary dust screens, erosion control barriers, temporary means of egress, and other temporary provisions as required to minimize disturbance to adjacent properties.
- D. Site access and temporary controls: Conduct demolition and debris removal operations to ensure minimum interference with roads.
- E. Protect existing Telephone Equipment, communication lines, water lines, irrigation lines, site improvements, appurtenances, and landscaping to remain, including that of adjacent properties.
- F. VISUAL INSPECTION REQUIRED PRIOR TO BIDS - Contractor shall be responsible for visually inspecting all existing site areas prior to bid date, comparing the visible conditions with the Bid Documents and include in Bid the cost of all demolition work as necessary to complete Work as indicated in the Contract Documents. Include removal of all existing materials that would interfere with the completed work.
- G. The Demolition Plans indicate general items & areas to receive demolition work but every condition is not indicated on the plans. Refer to new work required by the Site, Plumbing, Mechanical and Electrical Plans & Specification Sections that will require saw-cutting, patching of pavement and removal of existing drainage structures.

1.3 RELATED SECTIONS

- A. Section 31 00 00 - Earthwork
- ~~B. Section 32 12 16 – Asphaltic Concrete Paving~~
- C. Section 32 13 14 – Concrete Sidewalks, Curbs and Gutters

1.4 PROJECT RECORD DOCUMENTS

- A. Accurately record actual locations of utilities, subsurface obstructions, and limits of pavement removal.

1.5 CONDITIONS AT THE SITE

- A. Visit and examine the site. Note all conditions as to character and extent of proposed work involved. Include the removal of all existing materials that will interfere with new Work regardless if indicated on plans or not. No extras will be considered for any demolition work that is not specifically described in the Contract Documents but may be required to properly carry out the new work.

1.6 PROTECTIONS

- A. Execute all demolition work in an orderly and workmanlike manner with due consideration for any existing site features which are to remain.
- B. Repair and make good any damage to adjacent properties or improvements caused by demolition.
- C. No on-site burning of demolition materials will be permitted.

1.7 REGULATORY REQUIREMENTS

- A. Conform to applicable local code for demolition safety of adjacent structures, dust control and runoff control.
- B. Obtain required permits and licenses from authorities. Pay associated fees including disposal charges.
- C. Notify affected utility companies before starting work and comply with their requirements.
- D. Erect protective barriers or fencing to protect public.

1.8 PRE DEMOLITION MEETINGS

- A. Inspect and discuss condition of construction to be selectively demolished.
- B. Review and coordinate site and building demolition.
- C. Review requirements of work performed by other trades.
- D. Review areas where existing construction is to remain and requires protection.
- E. Review temporary pedestrian protection systems such as barricades, fencing or Covered Walkways.
- F. Review all Telephone & Communication Wiring & Pedestals in close proximity to Building and discuss means to protect from damage during construction.

1.9 SALVAGE AND DISPOSITION OF MATERIAL AND EQUIPMENT

- A. The Owner shall have priority for the selection of salvaged equipment and materials. Material not retained by the Owner shall become the property of the Contractor and shall be removed from the site by him.
- B. Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas. Clean up spillage from streets and adjacent areas.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

- A. Materials specified in Sections 31 00 00, 31 23 00 and Soil Report Section 02 30 00.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Provide, erect, and maintain erosion control devices, temporary barriers and security devices at locations indicated.
- B. Protect existing landscaping materials, appurtenances and structures which are not to be demolished. Repair damage caused by demolition operations at no cost to Owner.
- C. Prevent movement or settlement of adjacent structures.
- D. Mark location of utilities. Protect and maintain in safe and operable condition the utilities to remain. Prevent interruption of existing utility service to occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities as acceptable to governing authorities and the Owner's representative.

3.2 DEMOLITION REQUIREMENTS

- A. Conduct demolition to minimize interference with adjacent gutter structures or pavements.
- B. Cease operations immediately if adjacent structures appear to be in danger. Notify Owner. Do not resume operations until directed.
- C. Conduct operations with minimum interference to public or private access. Maintain access and egress at all times.
- D. Sprinkle Work with water to minimize dust. Provide hoses and water connections for this purpose.
- E. Comply with governing regulations pertaining to environmental protection.
- F. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.

3.3 DEMOLITION

- A. Proceed with demolition in systematic manner, from top of pavement to finished sub-grade elevation.
- B. Locate demolition equipment and remove materials so as to prevent excessive loading to adjacent gutter.
- C. Proceed with pavement removal at a Date consistent with sub-grade preparation and roadway reconstruction.

3.4 FILLING VOIDS

- A. Completely fill below subgrade areas any voids resulting from over removal or removal of unsuitable material using approved select fill materials.
- B. Ensure that areas to be filled are free of standing water, frost, frozen, or unsuitable material, trash, and debris prior to fill placement.
- C. Place fill materials in horizontal layers not exceeding 8" in loose depth and compact each layer at optimum moisture content of fill material to 95% maximum density (ASTM D698). Grade surface to match adjacent grades.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from site all materials resulting from demolition operations.
- B. Transport materials removed from roadway with appropriate vehicles and legally dispose off-site to areas which are approved for disposal by governing authorities and appropriate property owners.

END OF SECTION

SECTION 02 41 19 - SELECTIVE BUILDING DEMOLITION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section

1.2 SUMMARY

- A. Visual Inspection of Existing Interior and Exterior Conditions is Required Prior to Bids.
- B. Scope of Demolition:
 - 1. Demolition and removal of all non-structural items that would interfere with the installation of new work shall be removed. Take care to preserve existing equipment, devices and systems not indicated to be replaced such ceiling or wall mounted as fire alarm equipment, security equipment, security cameras, etc.
 - 2. Coordination with all trades is mandated, particularly the Mechanical, Electrical and Plumbing disciplines which may require additional demo other than that shown on the plans. If a subcontractor intends to remove more of any existing materials than shown in plans, he needs to inform the General Contractors bidding so that they can alert the effected trade to include the additional demo & replacement materials or patch materials in Bid Cost. Examples would be the Sprinkler Contractor who wants more existing ceilings removed to facilitate new sprinkler lines or the Mechanical Contractor who wants more ceilings removed to facilitate new ductwork or equipment. Another example would be sawcutting, removal of slab and patching.
- C. VISUAL INSPECTION REQUIRED PRIOR TO BIDS - Contractor shall be responsible for visually inspecting all existing areas prior to bid date and include in bid the cost of all demolition work as necessary to complete Work as indicated in the Contract Documents whether the items are shown to be demolished or not. The building is not vacated. The Contractor is encouraged to look above ceilings, and in spaces to inspect typical existing conditions prior to bids.
- D. The Demolition Plans indicate general items & areas to receive demolition work but every condition is not indicated on the plans. Refer to new work required by the Plumbing, Mechanical and Electrical Plans & Specification Sections that may require saw-cutting, patching of slab or walls that are not indicated on Demolition Plans but are required to facilitate the new work.
- E. Contractor shall submit required paperwork to DEQ for Building Demolition.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- C. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 PRE DEMOLITION MEETINGS

- A. Inspect and discuss condition of construction to be selectively demolished.
- B. Review all structural demolition planned of existing structure for temporary bracing needs.
- C. Review and finalize demolition schedule.
- D. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
- E. Review areas where existing construction is to remain and requires protection.
- F. Review temporary pedestrian protection systems such as barricades, fencing or Covered Walkways.
- G. Review all known underground utilities in close proximity to Building and discuss means to protect from damage during construction or re-locate.
- H. A subsequent meeting may be required to review all floor & roof deck penetrations and possible conflicts with all trades.

1.5 PROJECT CONDITIONS

- A. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- B. Hazardous Materials: Hazardous materials will be removed by Owner before start of the Work.
- C. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. If found, hazardous materials will be removed by Owner under a separate contract.
- D. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.
 - 2. Telephone pedestals and manholes shall remain unless otherwise indicated to be removed.
Receive User Agency approval prior to the disconnection of any telephone or communication lines.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Before starting selective demolition operations, verify that all utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. User Agency Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off indicated utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other buildings.

C. General Contractor shall Carefully review Mechanical, Electrical and Plumbing plans. Do not remove existing items where no new items are indicated to be replaced. Do not remove existing lighting, exhaust fans, heaters, fire alarm devices, mechanical equipment or plumbing fixtures unless new equipment is shown to replace these. Temporarily suspend all existing equipment not indicated to be replaced.

3.3 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

3.4 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and

used facilities.

1. Comply with requirements for access and protection specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades, pedestrian tunnels and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished. Retain a Licensed Civil Engineer if deemed necessary for shoring design. Project Architect/Engineer is not responsible for temporary shoring design.

3.5 PROTECTION

- A. Provide protection to ensure safe passage of people around selective demolition area and to and from other portions of building.
- B. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
- C. Protect existing work that are to remain or that are exposed during selective demolition operations. Repair where damaged. Section 01 50 00 Temporary Facilities and Controls.

3.6 SELECTIVE DEMOLITION GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Proceed with selective demolition systematically, from higher to lower level.
 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
Damage to existing structure as a result of demolition shall be called to the Architect's attention and shall be repaired or replaced at Contractor's Expense in accordance with Engineer's recommendation. Contractor will be responsible for paying a Louisiana Licensed Structural Engineer directly for his services involving needed remedial work as a result of such damage.
 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Do not use cutting torches near the existing terrazzo as the heat will cause damage to it. Maintain portable fire-suppression devices during flame-cutting operations. Maintain adequate ventilation when using cutting torches.
 4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 5. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 6. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 7. Legally dispose of demolished items and materials promptly.
- B. Removed and Reinstalled Items:
 1. Clean and repair items to functional condition adequate for intended reuse.
 2. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

1. See plans for structure and limited walls that are indicated to remain.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.
 1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before demolition began.

END OF SECTION

SECTION 03 20 00 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

- A. The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.2 DESCRIPTION OF WORK

- A. Provide all materials, labor, equipment, incidental services and accessories to place all reinforcing steel included in the Contract.
- B. Comply with requirements of the following codes and standards, except as herein modified (latest editions):
 - 1. American Concrete Institute, ACI 318 "Building Code Requirements for Reinforced Concrete".
 - 2. American Welding Society, AWS D12.1, "Reinforcing Steel Welding Code".
 - 3. American Concrete Institute, ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures".
 - 4. Concrete Reinforcing Steel Institute, "Recommended Practice for Placing Reinforcing Bars".
 - 5. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
- C. Submittals:
 - 1. Comply with pertinent provisions of Section 01 30 00.
 - 2. Submit to the Engineer for review Shop Drawings showing the fabrication and placing of reinforcing steel accessories. Before submittal to the Engineer, all Shop Drawings shall be checked by the Contractor and shall be signed to certify that this has been done.
- D. Reinforcement shall be stored on the site to prevent damage. Provide adequate blocking to prevent bars from contacting the ground. Any mud on bars shall be removed and bar brushed clean before placing bar in form.
- E. Reinforcement of Post Tension slab shall be the responsibility of the Post Tension Engineer.

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. Reinforcing Bars: ASTM A 615 Grade 60 (ASTM A 615M Grade 40), deformed.
- B. Steel Wire: ASTM A 82, plain, cold-drawn steel.
- C. Welded Wire Fabric: ASTM A 185, welded steel wire fabric. Rolls are acceptable.
- D. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place.

PART 3 - EXECUTION

3.1 PLACING REINFORCEMENT

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," & Manual of Standard Practice for Detailing Reinforced Concrete Structures (ACI 315) for details and methods of reinforcement placement and supports and as herein specified.
 - 1. Avoiding cutting or puncturing vapor retarder/barrier during reinforcement placement and concreting operations. Repair damages before placing concrete.

- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Engineer. Tie reinforcing in place using 16 GA, black annealed wire.
- D. Place reinforcement to maintain minimum coverage's as indicated for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces. Minimum protection of concrete shall not be less than as follows:
 - 1. 3 inches where concrete is poured against ground.
 - 2. 2 inches where concrete is poured against forms but will be in contact with ground.
 - 3. 1-1/2 inches minimum in exterior walls (exposed to weather but not in contact with ground.)
 - 4. 3/4 inches minimum in interior walls and interior face of exterior walls.
 - 5. 1-1/2 inches in beams, girders, and slabs.
 - 6. 3/4 inch minimum in roof and floor slabs.
- E. Bars shall lap 40 diameters at splices, except as otherwise indicated. Splices in adjoining horizontal bars shall be staggered at least 6 feet. Where this is not feasible, submit suggestions for Engineer's consideration. Horizontal bars shall be hooked around corners not less than 24 diameters, with a minimum of 12 inches as per typical details.
- F. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

END

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, are hereby made a part of this Section.

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including form work, concrete mix design, placement & procedures. The Testing Agency field technician shall be present at all concrete pours to check concrete slump, to prepare the required cylinders and monitor and control concrete slump.

1.3 SUBMITTALS

- A. General: Submit the Laboratory Test Reports for concrete materials & submit Concrete Mix Design according to Conditions of the Contract and Section 01 30 00 Specification Sections.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
1. ACI 318, "Building Code Requirements for Reinforced Concrete."
 2. ACI 301, "Specification for Structural Concrete."
- B. Concrete Testing Service: The Owner shall select a Testing Agency and the Contractor shall pay the Agency as established in Quality Control Section 01 40 00 for the following laboratory services:
1. Preparation of concrete cylinders for design mixtures and testing.
 2. Compression tests of cylinders and inspection of mixing of all concrete for job.
 3. Specimens: Prepared and cured in accordance with ASTM C-192 and tested in accordance with ASTM C-39. For standard weight structural concrete take four cylinders from each 50 yards of concrete deposited, but not less than one set for each day's concreting (7-day and 28-day break test shall be submitted to the Engineer).
 4. It is understood and agreed that laboratory inspection services in no way relieves Contractor of his responsibility and obligations under terms of Contract.
 5. Test of hardened Concrete in or removed from structure. Where questions exists as to concrete quality in job, Engineer may require tests as per ASTM C-42 or other load test for that portion of job where questionable concrete has been placed. Where required, make load tests as per Section 4.3 ACI Building Code (ACI 318-77). If load test indicated that concrete placed does not conform to Drawings and Specifications, take measures as directed to correct deficiency without extra cost to Owner.
 6. The laboratory's representative will be required to be present the entire time that the building slab is placed to test slump of concrete previous to installation.
 7. **The Contractor shall notify the Testing Lab and Engineer 24 hours before the intended concrete pour.**
 8. Both 7 day & 28 day concrete compression test results shall be provided to

the Engineer.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Forms for Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings.

2.2 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
 - 1. Use one brand of cement throughout Project unless otherwise acceptable to Engineer.
- B. Normal-Weight Aggregates: ASTM C 33 and as specified. Provide aggregates from a single source for exposed concrete.
- C. Lightweight Aggregates: ASTM C 330.
- D. Water: ASTM C-94
- E. Admixtures, General: Provide concrete admixtures that contain not more than 0.1 percent chloride ions.
- F. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- G. Water-Reducing Admixture: ASTM C 494, Type A.
- H. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E.
- I. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.

2.3 MIX DESIGN. (28 Day Compressive Strength unless higher strength is recommended in Geotechnical Report or on Structural Plans) **NO FLY ASH**

- A. Concrete Slab – 3500 PSI w/admixture for 6” slump for floor finishing if desired.
- B. Concrete Foundation – 3500 PSI w/ 4” – 4.5” slump
- C. Walks & Exterior Concrete– 3000 PSI air entrained per ASTM C 260.
- D. Equipment Pads – 3500 PSI air entrained per ASTM C 260.
- E. For all concrete at Elevator Pit: Crystalline Capillary Waterproofing Admixture equal to Masterlife 300 D. (required for walls, floors & slab tie-in)

2.4 SLAB PATCH AND REPAIR

- A. High Strength Permanent Repair: High strength permanent repair material shall be pre-blended, prepackaged cement-based mortar requiring only the addition of potable water. Manufactures shall be ISO 9001 certified and have at least five years experience in the manufacture of cement-based concrete repair materials.
 - 1. Five Star Structural Concrete ES by Five Star Products, Inc.

2.5 SLAB TOPPING AND REPAIR

- A. Self-Leveling Underlayment: The cement based self-leveling underlayment shall be recommended for application of 1/8" to 1" thickness and shall have a compressive strength of 4100psi after 28 days per ASTM C109.
 - 1. ARDEX K-15 by AREDEX Engineered Cements

2.6 RELATED MATERIALS

- A. Sand Cushion: Washed sand.
- B. Vapor Retarder/barrier: Provide vapor retarder/barrier cover over prepared base material where indicated below slabs on grade. Use only materials that are resistant to deterioration when tested in accordance with ASTM E 154, as follows:

1. Polyethylene sheet not less than 10 mils thick with seams lapped 6" & taped.
 - C. Liquid Membrane-Forming Curing Compound: Liquid-type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.55 kg/sq. m when applied at 200 sq. ft./gal.
 1. Eucocure, Eclid Chemical Co.
 2. CS-309 W.R. Meadows, Inc.
 3. Kure-N-Seal, Sonneborne Chemrex
 - D. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss. This is to be required on any day that concrete is poured when the day time high exceeds 80° F.
 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Eucobar, Ecuclid Chemical Co.
 - b. Confilm Master Builders, Inc.
 - E. Finishing exposed concrete: Rub surface of all new exposed concrete or where new work has damaged existing surfaces. Install bonding agent and two component mortar.
 1. Products: Subject to compliance with requirements, provide the following:
 - a. Acry-Lok, W.R. Meadows as a bonding agent.
 - b. Meadow Patch T2, W.R. Meadows
- 2.7 PROPORTIONING AND DESIGNING MIXES
- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301.
 - B. Submit Mix Design to Engineer of each proposed mix for each type of concrete in accordance with Section 01300. Do not begin concrete installation until proposed mix designs have been reviewed by Engineer.

2.8 EXPANSION JOINTS

- A. Fiber Board: Install "A" thick fiber board (W.R. Meadows Sealtight Fiber expansion joint) expansion joints in locations as shown plans. Use "A" vinyl cap at top of joint. Remove at job completion and caulk with approved material. Use end caps on dowel bars as shown on drawings. One side of joint will require stabilization with form until concrete is placed.

2.9 CONTROL JOINTS

- A. Saw cut the Concrete 1 /4 slab depth as shown on plans. Top of saw cut at joint to receive sealant at exterior locations.

PART 3 - EXECUTION

3.1 GENERAL

- A. Coordinate the location & installation of forms, joint materials, vapor retarder/barrier, reinforcing, electrical and plumbing materials and other related materials prior to concrete installation.

3.2 FORMS

- A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of

correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:

1. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, recesses, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, slopes and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide shoring at joints to prevent cement paste from leaking.
2. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
3. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
4. Fabricate forms for easy removal without hammering or prying against concrete surfaces.

3.3 VAPOR RETARDER/BARRIER INSTALLATION

- A. General: Following leveling and tamping of granular base for slabs on grade, place vapor retarder/barrier sheeting with longest dimension parallel with direction of pour.
- B. Lap joints 6 inches.

3.4 JOINTS

- A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength or appearance of the structure, as acceptable to Engineer.
- B. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.
- C. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- D. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 1. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."
- E. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch wide by one-fourth of slab depth or inserts 1/4 inch wide by one-fourth of slab depth, unless otherwise indicated.
 1. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.
 2. If joint pattern is not shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).
 3. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."

3.5 INSTALLATION OF EMBEDDED ITEMS

- A. General: Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached thereto.
- B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.7 CONCRETE PLACEMENT

- A. General: Comply with ACI 304, "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete," and as specified.
- B. Place concrete within 90 minutes from the time the truck leaves the plant when temperature is below 85 deg. F. When temperature is above 85 deg. F, the time shall be reduced to 60 minutes.
- C. Inspect: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of their work. Cooperate with other trades in setting such work.
- D. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified.
- E. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches (600 mm) and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
 - 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309. Do not vibrate more than necessary.
- F. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section is completed.
 - 1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
 - 2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 - 3. Maintain reinforcing in proper position on chairs during concrete placement.
- G. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), no concrete placement will be allowed.
 - 2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise approved by Engineer.
- H. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305.

3.8 MONOLITHIC SLAB FINISHES

- A. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other

bonded applied cementitious finish flooring material, and where indicated.

1. After placing slabs, finish surface to tolerances of F(F) 15 (floor flatness) and F(L) 13 (floor levelness) measured according to ASTM E 1155. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.
- B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and where indicated.
1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F(F) 18 (floor flatness) and F(L) 15 (floor levelness) measured according to ASTM E 1155. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, re-float surface to a uniform, smooth, granular texture.
- C. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or another thin film-finish coating system..
1. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances of F(F) 20 (floor flatness) and F(L) 17 (floor levelness) measured according to ASTM E 1155. Grind smooth any surface defects that would telegraph through applied floor covering system.
- D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply a trowel finish as specified, then immediately follow by slightly scarifying the surface with a fine broom.
- E. Non-slip Broom Finish: Apply a non-slip broom finish to exterior concrete platforms, steps, stair treads, ramps, sloped walks and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen concrete surface by sweeping with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Engineer before application.

3.9 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations.
- B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days. All concrete used for footing, columns, and beams shall achieve design strength before additional concrete placement operations commence.
- C. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, or by combinations thereof, as herein specified.
- D. Apply curing compound on exposed interior slabs and on exterior slabs, walks, and curbs as follows:
1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has

disappeared). Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete. Do not use curing compound where slabs are to receive clear finish or stain. Use moisture curing method in these areas.

3.10 REMOVAL OF FORMS

- A. General: Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 12 - 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form-removal operations, and provided curing and protection operations are maintained.

END

SECTION 04 20 00 - UNIT MASONRY ASSEMBLIES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.
- B. Related Sections include the following:
 - 1. Section 01 23 00 Alternates
 - 2. Section 07 10 11 Wall Flashing”
 - 3. Section 07 62 00 “Sheet Metal Flashing and Trim”
 - 4. Section 07 92 00 “Joint Sealants”
 - 5. Division 26 – Coordination with electrical is required to avoid exposed conduit.

1.2 SCOPE

- A. This Section includes unit masonry assemblies consisting of the following:
 - 1. Concrete Masonry Units (CMU)
 - 2. Brick
 - 3. Mortar and grout.
 - 4. Reinforcing steel.
 - 5. Masonry reinforcing.
 - 6. Joint reinforcement.
 - 7. Miscellaneous masonry accessories. (rebar lap-joint tie)
- B. Products installed, but not furnished, under this Section include the following:
 - 1. Steel lintels and shelf angles for unit masonry, furnished under Division 5 Section "Metal Fabrications."
 - 2. Metal flashing and manufactured reglets in masonry joints for metal flashing, furnished under Division 7 Section "Sheet Metal Flashing and Trim."
 - 3. Hollow-metal frames in unit masonry openings, furnished under Division 8 Section "Steel Doors and Frames."
 - 4. Wood blocking and nailers secured into masonry specified in Division 5, Section "Rough Carpentry"
 - 5. Through Wall Flashing
- C. The Design Intent of the Contract Documents includes the following:
 - 1. All items required for the completion of masonry work.

1.3 SUBMITTALS

- A. Product Data: For each different masonry unit, accessory, and other manufactured product specified.
- B. Shop Drawings: Show fabrication and installation details for all CMU reinforcing bars and joint reinforcement.
- C. Samples for Selection. Provide the following:
 - 1. Full-size units for each different exposed masonry unit required, showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
 - 2. Colored mortar Samples for each color required, showing the full range of colors expected in the finished construction. Make samples using the same sand and mortar ingredients to be used on Project.
 - 3. Accessories embedded in the masonry.
- D. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Each type of masonry unit required shall include size-variation data for brick, verifying that actual range of sizes falls within specified tolerances.
 - 2. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.

3. Each type and size of joint reinforcement.
4. Each type and size of anchor, tie, and metal accessory.

1.4 QUALITY ASSURANCE

- A. Single Source Requirements for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
- B. Single Source Requirements for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.
- C. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.
- D. Performance Requirements: Provide brick and concrete unit masonry that develops 1500 psi installed compressive strength at 28 days.
- E. Mockups: Before installing unit masonry, build mockup to verify joint type made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work:
 1. Build mockup for Architect's approval of typical wall area as shown on Drawings, including all masonry types, all colors, all backup walls and accessories. Include a sealant-filled joint at least 48 inches long in each mockup. Mock-up to be a minimum of 4'-0" wide and 4'-0" tall. Build mockups in location as directed by Architect.
 2. Provide mockups of all flashing & thru wall flashing conditions for Architect's approval.
- F. Pre-installation Meeting: Conduct meeting at Project site with all related trades, including all other exterior wall material trades. Notify Architect of meeting one week in advance.

1.5 BIDDER'S RESPONSIBILITY:

- A. Bidder shall review the Construction Documents and advise the architect of all questions and concerns 7 days prior to bids; Should the contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com. 318 322-2694 ext. 2

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver pre-blended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store pre-blended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress, extending & securing cover a minimum of 24" (600 mm) down each side..
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3

- days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by coverings spread on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the exterior wall on edge prior to rain to prevent rain from splashing mortar and dirt on completed work.
 - D. Cold-Weather Requirements: Do not install masonry when the temperature is 41 Deg. F and dropping or when the temperature is forecast to be 41 Deg. F or lower within 24 hours after installation. Do not use frozen materials or materials mixed or coated with ice or frost.. Remove and replace unit masonry that is installed without regard to these requirements. Provide detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.
 - E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Set masonry units within one minute of spreading mortar. Do not apply mortar to substrates with temperature above 100 degrees F (38 degrees C).
 - F. Rain Protection: Turn scaffold boards near the exterior wall on edge prior to rain to prevent rain from splashing mortar & dirt on completed work.
 - G. Where wall carpet is scheduled, all mortar joints shall be smooth so that joints do not telegraph thru the carpet.
 - H. **RUNNING BOND WALLS** – Extreme care shall be taken to insure that the vertical rebar is installed prior to block installation. This will require “threading” the CMU over the vertical rebar. Splices can be used if properly installed and visually approved by the architect. Additionally, concrete mix. (not mortar) shall be used to fill the cells at 4’ height intervals with a treme or sock.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS (CMU)

- A. Comply with ASTM C90, lightweight classification, load bearing, 1900 psi compression strength. 4” nominal - 3-5/8” actual, 6” nominal - 5-5/8” actual, 8” nominal - 7-5/8” actual. Bullnose shape where shown on plans and all outside corners of interior walls.
- C. Glazed CMU Finish ASTM C-90, Grade N, Type 1, 8” x 8” x 8” nominal size CMU with glazed finish on one or two adjacent sides as indicated.
- D. Split Face - Irregular face block where indicated
- E. Furnish “U-Block” and special shapes as required for project.
- F. Manufacturer’s: Subject to compliance with requirements.
 - 1. Acme Brick
 - 2. Arkhola Sand & Gravel Co.
 - 3. Approved equal.

2.2 BRICK

- A. Face brick and materials shall be manufactured by Acme, Boral, Columbus, Elgin Butler, Texas Clay, or equal. Face brick shall meet current ASTM requirements C-216.
- B. Brick shall **reasonably match existing adjacent building size**. All costs including labor and materials for installation shall be included in this Contract. **(Brick to be painted)**
- C. Size: APPROXIMATE 2-1/4" x 3-5/8" x 7-5/8". (MATCH EXISTING site verify prior to bids)
- D. Allow \$700 per thousand for brick

2.3 MORTAR AND GROUT PRE-MIXED (TINTED)

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
 - 1. Do not use calcium chloride in mortar or grout.
 - 2. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Type N - Mortar mix shall be equal to Magnolia Masons mix or Ideal Masonry Cement & comply with ASTM Specifications for masonry cement C-91 & Federal Specification SS-C-1960 Type 2 with integral waterproofing agent. Shall have a water repellency test equal to Federal Specifications SS-C-181E, Type 2. All mortar shall be Type S with 1800 PSI minimum compressive strength.
- D. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.
- E. Aggregate for Grout: ASTM C 404.
- F. Water: Potable.
- G. Mortar Cement: ASTM C 91.
- H. Hydrated Lime: ASTM C 207, Type N.
- I. CMU Grout: All CMU cells with reinforcing bars shall be filled with grout, Grout shall be 8" -10" slump concrete with pea gravel aggregate & shall achieve a min. of 2500 psi compressive strength at 28 days. Install 1/2" x 1/2" galv. Netting (Hardware cloth) over all open cells to receive grout.
- J. SAND: (NOT REQUIRED SINCE PRE BLENDED IS SPECIFIED) Washed sand shall conform to ASTM C-144. Sand shall consist of well screened, clean, hard siliceous particles free from loam, silt, organic matter or other impurities. When dry at least 97% shall be retained by a No. 100 sieve and 80% shall be retained on a No. 50 sieve.

2.4 REINFORCING STEEL

- A. Steel Reinforcing Bars or flat straps: Grade 60, ASTM A 615/A 615M.
- B. Bar lap tie joint – see product below.

2.5 JOINT REINFORCEMENT

- A. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Fy 60,000PSI. 10' pieces lap 6" at ends. Provide pre-formed corners and tees. Provide in widths for walls indicated on plan with 1/2" clearance to exterior face of masonry.
- B. CMU Wall Horizontal Reinforcement: Truss type, consisting of two (2) longitudinal side rods in 3-5/8", 5-5/8" or 7-5/8" CMU walls welded to cross rods. Out to out spacing of side rods shall be within 1" of each face of wall. Ten foot length, 9 ga. deformed, galvanized. Provide pre-formed corner and tee reinforcing at all CMU intersections. Hohmann & Barnard Inc. #120 Truss-Mesh Required spacing is 16" vertically. Equal by Heckmann or Dur-O-Wall.
- C. MASONRY TIES at CMU shall be equal to Hohmann & Barnard: THERMAL CONCRETE 2-SEAL™ TIE with a #14 screw with special alternating threads for use with CMU, barrel with factory-installed Stainless Steel bonded EPDM washers to seal both the face of the insulation and the air/vapor barrier, 1-1/2" diameter washer seals insulation and helps secure the insulation to backup, reducing or eliminating penetrations caused by insulation fasteners. Barrel length shall accommodate thickness of insulation and/or wallboard. Type 304 Stainless Steel Barrel with a Polymer Coated Screw, 3/16" 2-Seal

Byna-Lok Wire Tie (length based on wall cavity thickness) Install at 16" o.c. each way, top course, end course and as indicated. Equal by Section 01 25 00.

2.6 ADJUSTABLE ANCHORS FOR CONNECTING TO STRUCTURAL/FRAME

- A. Weld-On Anchor Straps and Wire Ties – Hot Dipped Galv.
1. Heckmann Building Products, Inc. ; # 315-B strap with # 316 Triangle Tie
 2. Hohmann & Barnard, Inc. ; # 359-FH strap with 302W Column Web Tie
 3. Approved Equal.

2.7 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded neoprene filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35 percent; of width and thickness indicated on plans; otherwise, use 3/8". Products subject to the compliance with the requirements:
1. Dur-O-Wal Rapid Soft-Joint
 2. MRCA vertical and horizontal expansion joint.
 3. Approved Equal.
- B. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- C. Mortar Netting: HDPE or polyester Mesh collection system provided in cavity of masonry wall construction to facilitate appropriate wall drainage complying with ASTM E514. 90% open, 10" High. 1" width where air space is less than 2" and 2" width where air space is 2" wide within wall cavity. Products subject to the compliance with the requirements:
1. Mortar Net USA, Ltd: Mortar Net
 2. Hohmann & Barnard, Inc. Mortar Trap
 3. Wire-Bond : Mortar Net
 4. Approved Equal.
- D. Weep Vents: Provide 3/8" W x 2 1/2" H x 3 3/8" L UV stable polyester weep vent @ 24" at all brick foundation sills & other places where indicated on drawings. Architect to select color from standard colors. Products subject to the compliance with the requirements:
1. Mortar Net USA, Ltd: Weep Vents
 2. Hohmann & Barnard, Inc. QV-Quadro-Vent
 3. Approved Equal.
- E. Weep Hole: Provide 1/4" x 4" plastic weephole @ 16" o.c. spacing above lintels on all opening heads and brick lintels or shelf.
1. Heckmann Building Products, Inc. ; #330
 2. Hohmann & Barnard, Inc. # 341
 3. Approved Equal.
- F. Brick Ties: Provide 7/8" wide x 7" long 22 ga. hot dipped galv. brick ties at intersection of brick corners near exterior doors as shown on plans @ 16" o.c. vertical spacing.
1. Heckmann Building Products, Inc. ; #260
 2. Hohmann & Barnard, Inc. # CWT
 3. Approved Equal.
- G. Rebar Lap-Joint Tie: Provide coiled shaped, coupling assembly which joins overlapping rebars in a positive, mechanical connection.
1. Hohmann & Barnard, Inc. Spyra-Lox sized for rebar thickness.
 2. Heckmann Building Products – Equal
 3. Approved Equal.
- H. Drip Plate or Drip Edge: Provide 3" wide Type 304 Stainless Steel with hemmed edge.
1. Hohmann & Barnard, Inc. DP for CMU, DP-LB for brick
 2. Heckmann Building Products – Equal
 3. Approved Equal.

- I. Rigid Partition Anchor: Provide 1 ½" wide x ¼" x2'-0" Hot Dipped Galvanized,
 - 1. Hohmann & Barnard, Inc. # 344 Rigid Partition Anchor
 - 2. Heckmann Building Products – Equal
 - 3. Approved Equal.

 - J. Mesh: For bonding intersecting walls or to contain mortar, ½" sq., hot dip galv., less wall width.
 - 1. Hohmann & Barnard, Inc. MWT
 - 2. Heckmann Building Products – Equal
 - 3. Approved Equal.

 - K. Rebar Positioners: For positioning rebar in center of block. Mill Galvanized.
 - 1. Hohmann & Barnard, Inc. RB
 - 2. Heckmann Building Products – Equal
 - 3. Approved Equal.
- 2.8 THRU WALL FLASHING – See Section 07 10 11

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
 - 2. Verify that foundations are within tolerances specified.
 - 3. Verify that reinforcing dowels are properly placed.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.2 INSTALLATION, GENERAL

- A. General: Install all masonry products, accessories and assemblies in strict accordance with manufacturer's recommended specifications. If the manufacturer's recommended specification conflicts with what is shown within this specification, then the manufacturer's recommended specification shall govern.
- B. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.
- C. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.
- D. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.
- E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- F. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- H. NEW EXTERIOR WALLS MUST BE THREADED OVER THE VERTICAL REINFORCING & PROPERLY LAPPED AND CONNECTED AS SHOWN ON WALL SECTION DETAILS ON PLANS & WALL SECTION DETAILS. STRICT COMPLIANCE WILL BE REQUIRED OR THE MASONRY CONSTRUCTION WILL NOT BE ACCEPTED.

3.3 CONSTRUCTION TOLERANCES

- A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:
- B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet (6 mm in 3 m), nor 1/2 inch (12 mm) maximum.
- C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, nor 1/2 inch (12mm) maximum.
- D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet (6mm in 3m) , nor 1/2 inch (12mm) maximum.
- E. Variation in Mortar-Joint Thickness: Thickness shall not vary from bed-joint thickness indicated by more than plus or minus 1/8 inch (3mm), with a maximum thickness limited to 1/2 inch (12mm). Shall not vary bed-joint thickness from bed-joint thickness of adjacent course by more than 1/8 inch (3mm). Shall not vary from head-joint thickness indicated by more than plus or minus 1/8 inch (3mm). Shall not vary head-joint thickness from adjacent head-joint thickness by more than 1/8 inch (3mm). Shall not vary from collar-joint thickness indicated by more than minus 1/4 inch (6mm) or plus 3/8 inch (10mm).

3.4 LAYING MASONRY WALLS

- A. Provide a "story pole" and lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half- size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
 - 1. Running bond.
- C. Lay concealed masonry with all units in a wythe in running. bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
- G. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
- H. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated. At fire-rated partitions, install firestopping in joint between top of partition and underside of structure above to comply with Division 7 Section "Firestopping."

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints. At cavity walls, bevel beds away from cavity, to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against the cavity face of the masonry.

3.6 CAVITIES

- A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.
 - 1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.
 - 2. Install continuous mortar net at weep course after first 2 courses of brick are laid.

3.7 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:
 - 1. Secure anchors through insulation & sheathing to wall framing with threaded metal fasteners of type indicated.
 - 2. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 - 3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally. Install additional anchors within 12 inches (of openings and at intervals, not exceeding 8 inches, around perimeter & at top course. Additional anchors and ties required at certain details of columns & pilasters in conjunction with the veneer.
- B. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
 - 1. Provide an open space not less than 1 inch (25 mm) in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
 - 2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure. Space anchors as indicated, but not more than 16 inches (610 mm) o.c. vertically.

3.8 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joints in unit masonry where indicated. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.
- B. Build-in horizontal pressure-relieving joints where indicated; construct inserting a compressible filler of width required for installing sealant and backer rod specified in Division 7 Section "Joint Sealants."
 - 1. Locate horizontal pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.
 - 2. At top brick $\frac{1}{4}$ " beneath bottom of shelf angle and install compressible filler in preparation for joint sealant.

3.9 LINTELS AND SHELF ANGLES

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.
- C. Provide minimum bearing of 8 inches (200mm) at each jamb, unless otherwise indicated.
- D. Where steel lintels cross a brick or building expansion joint, wrap lintel fully in 15# felt for length of lintel bearing on expansion joint side of opening.
- E. All openings in masonry walls shall have a 8" or 16" bond beam above opening with 8" bearing on each side. 2 #5 bars for 8" bond beam and 4 #5 bars for 16" bond beam unless more is indicated on engineer's plans.

3.10 HORIZONTAL JOINT REINFORCEMENT

- A. General: Provide continuous horizontal-joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of $\frac{5}{8}$ inch (16mm) on exterior side of

walls, 1/2 inch (13 mm) elsewhere. Lap reinforcing a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c. vertically.
2. Provide reinforcement in mortar joint 1 block course above and below wall openings and extending 12 inches (305 mm) beyond opening.
3. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
4. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" pieces. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.11 FLASHING, WEEP HOLES, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where otherwise indicated.
- B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Unless otherwise indicated, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
- C. Install Through Wall flashing as follows:
 1. Clean smooth all surfaces to receive flashing membrane. Remove sharp protrusions.
 2. Apply primer or adhesive for maximum adhesion
 3. Press flashing firmly into place by hand or with roller.
 4. Apply preformed end dams and corners by priming surface. Apply pressure to material by hand to assure proper contact. Insure that dams and corners are positioned to block water flow from entering the structure.
 5. At masonry extend flashing from exterior face of veneer, through veneer, up face of sheathing at least 16 inches, and behind weather barrier. Use roller
 6. At lintels and shelf angles, extend flashing a minimum of 4 inches (100mm) into masonry at each end. At heads and sills, extend flashing 4 inches (100 mm) at ends and overlap for binding with pre fabricated corners and end dams.
 7. Install metal drip edges beneath flashing at exterior face of wall. Stop flashing 1/2 inch (13 mm) back from outside face of wall and adhere flashing to top of metal drip edge.
 8. Cut flashing off flush with face of wall after masonry wall construction is completed.
 9. All wall surfaces are to be clean and free of dirt, dust, protrusions, and all foreign materials. Wall surface must be dry prior to installation of flashing system.
 10. Drip edge shall be held in place during construction with a continuous bead of urethane sealant or adhesive. The bent hemmed edge portion of the drip edge must extend beyond the vertical face of the masonry wall.
 11. Flashing material is not to be exposed to direct sunlight for longer than 60 days.
 12. Perform water spray test and repeat above if any leaks occur.

3.12 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison

purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.

3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
5. Clean brick by the bucket-and-brush hand-cleaning method described in BIA Technical Notes No. 20, using job-mixed detergent solution.

3.13 MASONRY WASTE DISPOSAL

- A. Excess Masonry Waste: Remove excess masonry waste and legally dispose of off Owner's property.

END OF SECTION

SECTION 05 10 00 STRUCTURAL STEEL

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Shop Drawings and Submittals: 01 33 00
- B. Product Requirements: 01 60 00
- C. Finish Painting: 09 90 00
- D. Hollow Metal Doors and Frames: 08 11 13

1.03 WORK INCLUDED

- A. Structural steel.
- B. Bolts, nuts, fastenings, attachments and anchors for structural items.
- C. Shop priming.

1.04 REFERENCES AND STANDARDS

The most current edition of following references and standards are made a part of this Section. All work shall conform to applicable requirements except as otherwise specified.

1. AISC 360 - Specification for Structural Steel Buildings.
2. AISC Specification for Structural Joints Using ASTM A325 or A490 Bolts.
3. AISC 305 – Code of Standard Practice for Steel Buildings and Bridges
4. AISC - Steel Design Guide Series 3 - Serviceability Design Considerations for Low- Rise Buildings.
5. ASTM A36 - Specification for Structural Steel.
6. ASTM A153 - Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
7. ASTM A307 - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile.
8. ASTM A325 - Specification for High Strength Bolts for Structural Steel Joints.
9. ASTM A123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
10. ASTM A490-92A - Specification for Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints.
11. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
12. ASTM A501 - Hot Formed Welded and Seamless Carbon Steel Structural Tubing.
13. ASTM A529 - Structural Steel with 50,000 psi Minimum Yield Point.
14. ASTM A570 - Specification for Hot-Rolled Carbon Steel Sheet and Strip, Structural Quality.
15. ASTM A572 - Specification for High Strength Low-Alloy Columbium- Vanadium Steels of Structural Quality.
16. ASTM A992 Standard Specification for Structural Steel Shapes.
17. AWS A2.4 - Standard Welding Symbols.
18. AWS D1.1 - Structural Welding Code – Steel.
19. AWS D1.3 - Structural Welding Code - Sheet Steel.
20. MBMA Low Rise Building Systems Manual.

1.05 SUBMITTALS

- A. Submit Shop Drawings for all work specified herein. The performing of any work prior to approval of Shop Drawings will be entirely at risk of Contractor.
- B. Fabricator shall check and verify all existing conditions that would affect the detailing and dimensioning of the structural steel work.

- C. Show location, markings, quantities, materials, catalog numbers, sizes and shapes. Indicate by dimensions, locations of miscellaneous metal items.
- D. Indicate methods of connecting, anchoring, fastenings, bracing and attaching pieces of this work in relation to one another and to work of other trades.
- E. Submit current welder certification for all shop and field welders engaged in the work.
- F. Draw profiles, sections and views, of items especially manufactured for this work, at a scale large enough to permit checking for design conformity.
- G. Use symbols and indications in compliance with "Structural Shop Drafting" by AISC.
- H. Indicate type and number of shop paint coats.
- I. List manufactured catalog items (if any) by manufacturer's name and number.

1.06 HANDLING

- A. Comply with requirements in Section 01600.
- B. Materials shall be delivered to site in undamaged condition and shall be stored above ground and under cover. Material shall be kept free from dirt, grease, and other foreign matter, and shall be protected from corrosion.

1.07 COORDINATION

- A. Coordinate work of this Section with work supported by, connected to, or contingent upon sequencing of, structural and miscellaneous metals.

1.08 TREATMENT OF CONTACT SURFACES

- A. Dissimilar Metals: Where aluminum surfaces contact, or are anchored to dissimilar metals, coat the contact surface of the dissimilar metal with one (1) coat of zinc-chromate primer followed by two (2) coats of aluminum paint. Where aluminum contacts copper, separate the metals with a layer of fifteen pound felt in addition to painting the surfaces.
- B. Masonry, Concrete and Plaster: Where aluminum contacts or is anchored to these surfaces, give the contact surface of the aluminum a coat of bituminous paint.

PART 2 - PRODUCTS

2.01 BASIC MATERIALS

- A. Structural-Steel Shapes:
 1. Wide Flange Shapes: ASTM A992,
 2. M, S and HP Shapes, Channels and Angles: ASTM A36,
 3. Hollow Structural Shapes (HSS): ASTM A500 GRADE B.
- B. Steel Plate, Bar, or Strip: ASTM A 529/A 529M, ASTM A 570/A 570M, or ASTM A 572/A 572M; 50,000-psi (345-MPa) minimum yield strength.
- C. Structural-Steel Sheet: Hot-rolled, ASTM A 570/A 570M, Grade 50 or Grade 55; hot-rolled, ASTM 568/A 568M; or cold-rolled, ASTM A 611, structural-quality, matte (dull) finish.
- D. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, structural quality, Grade 50, with G60 (Z180) coating designation; mill phosphatized.
- E. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); carbon-steel, hex-head bolts; carbon-steel nuts; and flat, unhardened steel washers. All bolts shall be hot dip galvanized in accordance with ASTM A153.
- F. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers. All bolts shall be hot dip galvanized in accordance with ASTM A153.

G. Primers: As selected by manufacturer for resistance to normal atmospheric corrosion, compatibility with finish paint systems, capability to provide a sound foundation for field-applied topcoats despite prolonged exposure, and as follows:

1. Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer; complying with performance requirements of FS TT-P-664.

H. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application, and with a 30-minute working time.

2.02 CONNECTIONS

A. Welding Electrodes: E70 Series of Specification for Mild Steel Arc Welding Electrodes, AWS D1.1.

B. Bolts and Nuts:

1. Anchor Bolts, Erection Bolts (Fabricator, provide 2 at each connection.) ASTM A 307 Grade A.
2. Bolted Connections: ASTM A 325.

C. Expansion Bolts: USM Parabol, or approved equal.

2.03 SHOP FABRICATION

General: Design components and field connections required for erection to permit easy assembly and disassembly.

1. Fabricator shall be responsible for the design of all connections and details not shown on the design drawings. Shop drawings showing all connections shall be submitted for approval.

2. Fabricate components in a manner that once assembled in the shop, they may be disassembled, repackaged, and reassembled in the field.

3. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.

4. Fabricate framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Cold-formed members shall be free of cracks, tears, and ruptures.

I. Primary Framing: Shop-fabricate framing components to indicated size and section with base plates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

1. Make shop connections by welding or by using high-strength bolts.

2. All high strength bolted connections shall be bearing type with the threads included in the shear plane (ASTM A325N). Maximum bolt spacing shall be six inches.

3. All beam connections which are not detailed or otherwise noted on the design drawings shall be bolted in accordance with AISC Framed Beam Connection Table II using the maximum number of rows of bolts possible. Equivalent welded connections in accordance with AISC Table III using a minimum of 1/4" weld may be used.

4. An erection seat shall be provided on column web where a beam of twelve inches or more in depth frames into holes common to another beam.
5. Welding shall conform to AWS D1.1 using E70XX low hydrogen SMAW electrodes or other electrode/flux combinations approved by D1.1.
6. Join flanges to webs of built-up members by a continuous submerged arc-welding process.
7. Brace compression flange of primary framing by angles connected between frame web and purlin or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
8. Weld clips to frames for attaching secondary framing members.
9. Columns shall be milled at base plates and splices.
10. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary structural members with specified primer after fabrication.
- J. Factory Priming for Field-Painted Finish: Where field painting after installation is indicated, apply the specified air-dried primer immediately after cleaning and pretreating.
 1. Prime galvanized members, after phosphoric acid pretreatment, with manufacturer's standard zinc dust, zinc-oxide primer.
- K. Tolerances: Comply with AISC Code of Standard Practice, Section 6.4.

2.06 SHOP PAINTING

- A. Clean ferrous metal of scale, rust, oil, moisture, and dirt before applying paint. Comply with Steel Structure's Painting Council, SSPC, Articles SP-1, "Solvent Cleaning" and SP-6, "Commercial Blast Cleaning."
- B. Unless specified otherwise, apply one (1) coat of shop paint with approved primer to all surfaces of non-galvanized ferrous metals. Do not paint contact surfaces which are to be welded. Use asphalt paint on ferrous metal in contact with non-ferrous metals.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Comply with AISC "Specifications and code of Standard Practice", and with specified requirements. Maintain work in safe and stable condition during erection.
- B. Install steel level, true to a line, plumb, or as indicated. Shim bearing plates with metal and grout solid.
- C. Weld field connections where practicable. Grind smooth field welds that will remain exposed upon completion of work and treat with same material as shop coat. Conceal all fastenings where practicable. Welds: 1/16" less than thinnest member.
- D. Flame cutting of steel on site will be permitted only with specific written approval.
- E. Examination
 1. *Verify site conditions prior to commencement of construction.*

2. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position.
3. In event of discrepancy, notify the Architect. Do not proceed with installation until discrepancies have been resolved

3.02 TEMPORARY SHORING AND BRACING

- A. Provide temporary shoring and bracing as required, with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines, as necessary, to achieve proper alignment of members as erection proceeds.

3.03 ANCHORING SYSTEMS

- A. Provide anchor bolts and other connectors required for securing steel to concrete and masonry, unless detailed otherwise.
- B. Provide templates and other devices as necessary for presetting bolts and other anchors in accurate locations.
- C. Set bolts in epoxy grout where detailed in accordance with Section 03600.
- D. Expansion bolts will be permitted only where shown on Drawings.

3.04 BASE PLATES

- A. Clean concrete and masonry bearing surface and roughen to improve bond.
- B. Set loose and attached base plates for structural members on wedges, shims or other adjusting devices.
- C. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut or grind off flush with edge of base plate prior to packing with shrinkage resistant grout.
- D. Pack shrinkage resistant grout solidly between bearing surfaces of bases and plates to ensure that no voids remain. Finish exposed surfaces, and allow to cure. Protect from damage until cured.

3.05 FIELD ASSEMBLY

- A. Erect framing true to line, level, plumb, rigid, and secure. Level base plates to a true even plane with full bearing to supporting structures, set with double nutted anchor bolts. Use a non-shrinking grout to obtain uniform bearing and to maintain a level base line elevation. Moist cure grout for not less than 7 days after placement.
- B. Do not field cut or alter structural members without approval of the engineer of record.
- C. Field connections shall be bolted unless shown otherwise on the plans.
- D. Bolted connections shall be made using ASTM A325 Type 1, $\frac{3}{4}$ " diameter (minimum) bolts unless noted otherwise on plans. ASTM A307 bolts may be used purlin, girt, and other secondary connections.

- E. All bolts shall be tightened by the turn-of-nut method to the minimum tension as specified in the "Specification for Structural Joints Using ASTM A325 or A490 Bolts." Hardened washers shall be used under the element being turned.
- F. When connections require field preparation of bolt holes, the holes shall be drilled 1/16" greater than the nominal bolt diameter. Gas cutting of bolt holes is not allowed.
- G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized.
- H. Galvanized surfaces damaged during transportation or erection should be repaired using a cold galvanizing compound containing 95% metallic zinc, by weight in the dried film.

3.07 FIELD WELDING

- A. Provide all welds in accordance with the latest issue of AWS "Structural Welding Code". Finished members shall be true to line and free from twists, bends and open joints. Finished work shall be subject to final approval of the Engineer. Particular care shall be exercised in welding light members to prevent burning of same. Grind welds smooth where exposed to view. Welds: 1/16" less than thinnest member.
- B. Do not use any welder on Project unless he has been qualified by an approved testing laboratory in accordance with requirements of the AWS in the past twelve (12) months.

3.08 CLEANING, PROTECTION

- A. Dispose of excess materials and remove debris from site.
- B. Clean work in accordance with manufacturer's recommendations.
- C. Protect work against damage until final acceptance. Replace or repair to the satisfaction of the Architect (owner), any work that becomes damaged prior to final acceptance.
- D. Touch up minor scratches and abrasions with touch up paint matching the original type and color.

Do not allow components to come in contact with dissimilar metals such as copper, lead or graphite. Water run-off from these materials is also prohibited.

END

SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Exterior & Interior load-bearing and wall system as indicated on plans.

1.3 RELATED SECTIONS

- A. Related Sections include the following:
 - 1. Section 05 50 00 "Metal Fabrications" for masonry shelf angles and connections.
 - 2. Section 09 21 16 "Gypsum Board Assemblies" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.

1.4 REQUIREMENTS

- A. The design, installation and construction of the structural cold formed metal framing shall be in accordance with AISI-General and AISI-NASPEC including AISI Standard Header 2004, AISI Wall Stud Design 2004 and AISI Lateral 2004, AISI 2500 Gyp. Bd. & Plaster, AISI 2507 Lathing & Plastering, ASTM C 955-03, ASTM C1003, ASTM C 955-03, ASTM C1007-04 & ASTM C1007 Annexes.
- B. Structural Performance: Provide cold-formed metal framing, connections, anchors and fasteners capable of withstanding wind loads per IBC 2021 and where shown on drawings. (Note: see plans for min. stud width.)
 - 1. Design Loads:
 - a. Dead Loads: Weights of materials and construction
 - b. Wind Loads: per 2021 IBC:
 - 2. Deflection Limits: Design framing and connections to structure to withstand design loads without deflections greater than the following:
 - a. Exterior Framing: Horizontal deflection of 1/600 of the wall height for all masonry & plaster.
 - 3. Design framing connections to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F.
 - 4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
 - a. Upward and downward movement of 3/4 inch.
- C. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold- Formed Steel Framing - General Provisions."
 - 1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing - Header Design."
 - 2. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- D. Mock-Up Required for all types of framing connections including steel to steel and steel to concrete.

1.5 SUBMITTALS

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Shop Drawings: Show complete plan & elevation layout, arrangements, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, all clips, clip angles and attachment to adjoining work & structure.
 - 1. For all cold-formed metal framing, include engineered design guides showing conformance with local load conditions. For all framing connections & anchors, include structural analysis signed

and sealed by the Louisiana Licensed engineer responsible for their preparation.

- C. Welding certificates: Copies of certificates for welding procedures and personnel.
- D. Product Test Reports: From a qualified testing agency, unless otherwise stated, indicating that each of the following complies with requirements, based on evaluation of comprehensive tests for current products:
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners including self tapping screws, powder actuated fasteners & drill-in anchors.
 - 5. Vertical deflection clips.
 - 6. Horizontal drift deflection clips
 - 7. Miscellaneous structural clips and accessories.
- E. Research/Evaluation Reports: For cold-formed metal framing.

1.6 QUALITY ASSURANCE

The Design Intent of the Construction Documents is to include all items required for the completion of system whether or not they are shown on the documents, but are necessary to provide the intended results.

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified Louisiana Licensed engineer for all studs, framing, connections & anchors between all cold formed metal framing members and between cold formed metal framing members and structure.
- B. Licensed Engineer Qualifications: A professional engineer who is legally qualified to practice in Louisiana and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated.
- D. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment, indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- E. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- F. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- G. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold- Formed Steel Framing - General Provisions."

1.7 BIDDER'S RESPONSIBILITY:

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect at least 7 business days prior to Bids.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling. Store with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the

following:

- B. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:
 - 1. Clark/Dietrich Metal Framing.
 - 2. Consolidated Fabricators Corp.; Building Products Division.
 - 3. Craco Metals Manufacturing, LLC.
 - 4. Custom Stud, Inc.
 - 5. Dale/Incor.
 - 6. MarinoWare; a division of Ware Industries.
 - 7. Super Stud Building Products
 - 8. United Metal Products, Inc.
 - 9. Southeastern Stud & Components
 - 10. Prior Approved Equal in accordance with Section 01 25 00.

2.2 MATERIALS

- A. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
- B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G60 Z180. (Hot-dipped Galvanized coated)
- C. Steel Sheet for Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
 - 1. Grade: As required by structural performance.
 - 2. Coating: G90 (Z275).

2.3 STRUCTURAL WALL FRAMING

- A. Steel Studs: Manufacturer's standard SSJ shaped steel studs, of web depths indicated, punched, with stiffened flanges, sized as required for Dead & Lateral Loads but no less than the following:
 - 1. Required Minimum Base-Metal Thickness: 16 ga. (.0428 inch) 33ksi min.
 - 2. Required Flange Width: 2" min.
 - 3. Section Properties: Per AISI Standards.
 - 4. See Plans for assumed sizes.No "equivalent thickness" products accepted for exterior wall members.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: Matching steel studs.
 - 2. Flange Width: 1-1/4 inches, **except use 2" @ 48" o.c. as noted under 1.2 Summary for Perimeter Walls to secure fiberglass panels.**
- C. Vertical Deflection Clips: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web. Mechanical attachment to structure and screw attachment to stud web using step-bushings to permit frictionless vertical movement; 68 mils minimum thickness, size as required by structural design calculations. Use only vertical deflection connection products that have a valid ICC ES Report complying with ICC Acceptance Criteria AC261, such as ICC-ESR-1903 or equivalent.
- D. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure, having a valid ICC ES Report complying with ICC Acceptance Criteria AC261, such as ICC-ESR-2049 or equivalent. Mechanical attachment to structure and screw attachment to stud web using step-bushings to permit frictionless vertical movement; 68 mils minimum thickness, size as required by structural design calculations.
- E. Framing Deflection Clips: Manufacturer's L shaped Grade 50, 14 ga. steel bracket with 3 slots, 3 step bushings & fasteners securing to existing structure. Install clip between existing concrete beam and new stud web allowing vertical movement of 1 1/2", having a valid ICC ES Report complying with ICC

Acceptance Criteria ICC-ESR-1903 or equivalent, size as required by structural design calculations.

- F. Special Solid Backing Support Plates: Wall Backing plates designed to provide a solid backing support for handrails, wall-mounted shelving, base at exterior walls where there is no runner, flat screen monitors and similar equipment. ASTM A653/A653M structural steel, zinc coated of grade and coating as follows:
1. Grade 50 (340), Class 1 or 2.
 2. Coating: G-60 steel
 3. Minimum Design Thickness of 0.0329 inch. (20 gauge)

2.4 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's required thickness and configuration, unless otherwise indicated, as follows:
1. Supplementary framing.
 2. Bracing, bridging, solid blocking & strapping.
 3. Web stiffeners.
 4. Anchor clips.
 5. End clips.
 6. Foundation clips.
 7. Gusset plates.
 8. Stud kickers, knee braces, and girts.
 9. Joist hangers and end closures.
 10. Hole reinforcing plates.
 11. Backer plates.
- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- E. Adhesive Anchors to Concrete: Where required or indicated on plans. Fabricated from corrosion-resistant materials, with allowable load or sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- F. Screw anchors to Concrete: Where required or indicated on plans. Fabricated from corrosion-resistant materials, with allowable load or sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- G. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere. Screw penetrations through joined materials shall not be less than 3 exposed threads.
- H. Welding Electrodes: Comply with AWS standards.

2.5 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.
- B. Shims: Load bearing, high-density multimonomer plastic, nonleaching.
- C. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Install sealer gaskets at the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 - 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
- E. Cut framing members by sawing or shearing; do not torch cut.
- F. Secure cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - 1. Comply with AWS D1.3/D1.3M & AISI manual requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - 2. Locate mechanical fasteners and install according to Shop Drawings and complying with requirements for spacing, edge distances, and screw penetration.
 - 3. All welds and damage to galvanized coating must be touched up with zinc-rich paint.
- G. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- H. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- I. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- J. Install insulation, specified in Section 07 21 00 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Secure hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of L/960 or 1/8 inch in 10 feet and as follows:
 - 1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 EXTERIOR CURTAINWALL OR LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Set studs plumb, fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: 16 inches.
- C. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Mechanically fasten vertical deflection clips to studs and anchor to building structure.
- D. Install horizontal bridging in curtain-wall studs, spaced in rows indicated on Shop Drawings.
 - 1. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud

flanges and secure solid blocking to stud webs or flanges.

2. Bridging: Wall bridging bars installed according to manufacturer's written instructions.
- E. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.
- F. Cutting of flanges is not permitted.
- G. Cutting of additional holes other than those provided by manuf. is not permitted.
- H. Splicing of axially loaded members is not permitted.
- I. Torch cutting if studs is not allowed.

- J. Prior to drilling holes in existing concrete for the installation of embedded anchors, the installer is responsible for locating existing reinforcing through the use of nondestructive means capable of detecting rebar at depths of up to 6" with an accuracy of +/- 1/2". Location of rebar shall be marked and verified prior to drilling. Power Activated Fasteners of limited depth may not require location of existing reinforcing.

3.5 FIELD QUALITY CONTROL

- A. Testing: Owner may engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Related Sections include the following:
 - 1. Section 03 30 00 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
 - 2. Section 05 10 00 "Structural Steel."

1.3 REFERENCES

- A. American Welding Society (AWS) D1.1 - Structural Welding Code.
- B. ASTM International (ASTM):
 - 1. A36/A36M - Standard Specification for Carbon Structural Steel.
 - 2. A123/A123M - Standard Specification for Zinc (Hot-Galvanized) Coatings on Iron and Steel Products.
 - 3. A283 - Standard Specification for Low and Intermediate Strength Carbon Steel Plates.
 - 4. A307 - Standard Specification for Carbon Steel Externally Threaded Standard Fasteners.
 - 5. A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - 6. A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
 - 7. A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 8. A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 9. A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength, Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 10. C94 - Standard Specification for Ready-Mixed Concrete.
 - 11. E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings.
- C. National Association of Architectural Metal Manufacturers (NAAMM):
 - 1. AMP 510 - Metal Stairs Manual.
 - 2. MBG 531 - Metal Bar Grating Manual.
- D. Society for Protective Coatings (SSPC) - Painting Manual.

1.4 SCOPE

- A. This Section includes the following:
 - 1. Loose steel lintels.
 - 2. Miscellaneous framing and supports.
 - 3. Loose bearing plates.
 - 4. Angle reinforcing around all roof penetrations (whether shown or not)

1.5 SUBMITTALS

- A. Shop Drawings: Detail fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections and details of metal fabrications and their connections. Show anchorage, weld types and accessory items. Provide templates for anchors and bolts specified for installation under other Sections.
- B. Samples for Verification: Submit for each type and finish of extruded nosing and tread.
- C. Mill Certificates: Signed by manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.
- D. Welding Certificates: Copies of certificates for welding procedures and personnel.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their

capabilities and experience.

- F. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- B. Provide lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1, "Structural Welding Code--Steel."
 - 2. Certify that each welder performing work has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.8 COORDINATION

- A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- B. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

PART 2 - PRODUCTS

2.1 FERROUS METALS

- A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- B. Steel Sections: ASTM A 36/A 36M.
- C. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- D. Steel Tube: Cold-formed steel tubing complying with ASTM A 500.
- E. Steel Pipe: ASTM A 501, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.
- F. Checkered Plate: ASTM A1011/A111M, diamond pattern.
- G. Cast-in-Place Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials capable of sustaining, without failure, the load imposed within a safety factor of 4, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency. Provide bolts, washers and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.
- I. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: As indicated.
 - 2. Material: Cold-rolled steel, ASTM A 1008/A 1008M, structural steel, Grade 33; 0.0966- inch (2.5-mm) minimum thickness; unfinished.
- J. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.2 PAINT

- A. Shop Primers: Provided primers shall comply with Section 09 90 00 "Painting" and be compatible with finish coats. Prepare in accordance with Article 2.10 of this Section. Universal Shop Primer shall be fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- B. Surface Preparation: Clean ferrous metal of scale, rust, oil, moisture, and dirt before applying paint.

Comply with Steel Structure's Painting Council, SSPC, Articles SP-1, "Solvent Cleaning" and SP-6, "Commercial Blast Cleaning." Unless specified otherwise, apply one (1) coat of shop paint with approved primer to all surfaces of non-galvanized ferrous metals. Do not paint contact surfaces which are to be welded. For surfaces indicated to receive High Performance Paint, confirm best primer to use with the High Performance Paint Installer for warranty purposes and submit primer paint recommendation with Shop Drawings.

- C. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.
- D. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

2.3 FASTENERS

- A. General: Provide 316 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568, Property Class 4.6) with hex nuts, ASTM A 563 (ASTM A 563M) and where indicated, flat washers.
- C. Machine Screws: ANSI B18.63 (ANSI B18.6.7M).
- D. Lag Bolts: ANSI B 18.2.1 (ANSI B18.2.3.8M).
- E. Wood Screws: Flat head, carbon steel, ANSI B18.6.1.
- F. Plain Washers: Round, carbon steel, ANSI B18.22.1 (ANSI B18.22M).
- G. Lock Washer: Helical, spring type, carbon steel, ANSI B18.21.1.(ASME B18.21.2M)
- H. Post-Installed Anchors: Torque Controlled Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
 - 1. Material for Interior Locations: Carbon steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material for Exterior Locations: Group 1 alloy 304 or 316 stainless-steel bolts and nuts complying with ASTM F 593 (ASTM F 738M) and ASTM F 594 (ASTM F 836M).
- I. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as required.

2.4 FABRICATION, GENERAL

- A. Pre-assemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Shear and punch metals cleanly and accurately. Remove burrs.
- C. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches those adjacent.
 - 5. All welds shall be ground smooth in the shop prior to delivery to Job Site to minimize detectability of connections
- E. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- F. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

- G. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.
- H. Allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- I. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- J. Remove sharp or rough areas on exposed traffic surfaces.
- K. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

2.5 LOOSE STEEL LINTELS

- A. Fabricate loose structural-steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
- B. Weld adjoining members together to form a single unit where indicated.
- C. Size loose lintels to provide bearing length at each side of openings equal to 1/12th of clear span, but not less than 8 inches, unless otherwise indicated.
- D. Prime loose steel lintels located in exterior walls in accordance with Section 09 90 00.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide all steel framing and supports that are not a part of structural-steel framework as necessary to complete the Work. (Example: Roofing penetrations such as exhaust fans or gooseneck vents.
- B. Fabricate units from structural-steel shapes, plates and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.
- C. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.
- D. Prime miscellaneous framing and supports isolated in exterior walls and where indicated.

2.9 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

2.10 STEEL AND IRON FINISHES

- A. Galvanizing: Where galvanizing is indicated, use hot-dip to comply with applicable standard listed below:
 1. ASTM A 123, for galvanizing steel and iron products.
 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed metal fabrications:
 1. Exteriors (SSPC Zone 1B): SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."
- C. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing or masonry, unless otherwise indicated. Comply with SSPC-PA1, "Paint Application Specification No. 1," for shop painting. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. General: Install all Metal Fabrications in strict accordance with manufacturer/fabricator's recommended specifications.
- B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- F. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- G. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.2 SETTING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
 - 1. Use non-shrink grout, either metallic or nonmetallic, in concealed locations where not exposed to moisture; use non-shrink, nonmetallic grout in exposed locations, unless otherwise indicated.
 - 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings, if any.
- B. Anchor supports for operable partitions securely to and rigidly brace from building structure.
- C. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns. Where grout space under bearing plates is indicated at girders supported on concrete or masonry, install as specified above for setting and grouting bearing and leveling plates.
- D. Install pipe and tube columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified above for setting and grouting bearing and leveling plates.

3.4 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

END OF SECTION

SECTION 06 10 01 – ROUGH CARPENTRY**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. See Section 06 40 23 “Architectural Carpentry” for nonstructural carpentry items exposed to view and not specified elsewhere.

1.3 SUMMARY

- A. Types of work in this section include rough carpentry for:
 - 1. Wood framing.
 - 2. Rough Carpentry Framing
 - 3. Wood Structural Panels (Plywood)
 - 4. Anchors and Fasteners
- B. Warranties: Include copies of warranties from manufacturers for each product.
- C. Low VOC product compliance with wood containing no added ureaformaldehyde resins is required.
- D. The Design Intent of the Construction Documents is to include all items required for the completion of this work whether or not they are shown on the documents, but are inferable as being necessary to provide the intended results. Every conceivable wood framing detail is not indicated. Use similar details for conditions not indicated as well as standard framing practices of good securement, proper support of load bearing conditions. Include in bid all necessary wood framing, supports, fasteners not specifically indicated but required for overall buildability & structural performance. The Design intent is for all floors to be adequately supported by trusses, walls, beams or ledgers secured to walls. Consult with Engineer after mock-up is made of typical framing conditions for approval. Refer to architectural drawings for drywall assemblies at fire rated walls not shown on Engineering drawings.
- E. Notches and Holes cut in load bearing members shall be minimized. Consult with Engineer prior to creating any void in a load bearing member (stud, beam, plate, joist, etc) greater to that shown in Detail B/A5.6 & J/B5.4. Use 16d common hot dipped galvanized nails for securement of all the wood nailers.

1.4 DEFINITIONS

- A. Rough carpentry includes carpentry work not specified as part of other sections and which is generally not exposed, except as otherwise indicated.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

1.5 SUBMITTALS

- A. Material Certificates: Where dimensional lumber is provided to comply with minimum allowable unit stresses, submit listing of species and grade selected for each use, and submit evidence of compliance with specified requirements. Compliance may be in form of a signed copy of applicable portion of lumber producer's grading rules showing design values for selected species and grade. Design values shall be as approved by the Board of Review of American Lumber Standards Committee.
- B. Wood Treatment Data: Submit chemical treatment manufacturer's instructions for handling, storing, installation and finishing of treated material.
 - 1. Preservative Treatment: For each type specified, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained and conformance with applicable standards.
 - 2. For water-borne treatment include statement that moisture content of treated materials was reduced to levels indicated prior to shipment to project site.
 - 3. For fire-retardant treated wood with chemicals, provide data and certification that treated materials comply with requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels; provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials. For lumber and plywood pressure treated with waterborne chemicals, sticker between each course to provide air circulation.

1.7 PROJECT CONDITIONS

- A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow attachment of other work.
- B. Verify and provide where miscellaneous blocking is required for grab bars, railings, toilet accessories, toilet partitions, etc.
- C. Wood and lumber that is split by fasteners is unacceptable.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
 1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
 3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 4. Provide dressed lumber, S4S, unless otherwise indicated.
 5. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
 6. Provide dry lumber with 15 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
 7. Finger jointed, manufactured using low-emitting, urea formaldehyde-free binders.
 8. Certified to FSC STD-04-004.
- B. Wood Structural Panels:
 1. Plywood: DOC PS 1. Minimum 5/8" CDX Structural Rated Plywood, pressure treated on 1st floor.
 2. Oriented Strand Board: (Only if indicated on plans) DOC PS 2.
 3. Thickness: As needed to comply with requirements specified but not less than thickness indicated.
 4. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."
 5. Factory mark panels according to indicated standard.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA C2 (lumber) and AWPA C9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).
 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and the following:
 - a. Alkaline Copper Quaternary (ACQ); free from arsenic, chromium, and other EPA classified hazardous preservatives.
 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.

- D. Application: Use Wood Preservative Treated Materials for the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, parapet wall plywood substrate, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 3. Wood framing members less than 18 inches above grade.
 4. Wood floor plates that are installed over concrete slabs directly in contact with earth.
- E. Precautionary Measures: Wood treated with some wood preservatives, particularly Alkaline Copper Quaternary (ACQ), appears to have an adverse reaction with traditional materials used for fastenings and fittings such as steel and galvanized steel. Where contact between preservative treated wood and metal products and materials such as steel studs, metal decking, flashing and aluminum windows is unavoidable, separation shall be provided between the materials with a barrier of self adhering modified bitumen membrane. ALL FASTENERS IN CONTACT WITH PRESERVATIVE TREATED WOOD PRESERVATIVES SHALL BE MADE OF STAINLESS STEEL.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, provide materials that comply with performance requirements in AWPAC20 (lumber) and AWPAC27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5664, for lumber and ASTM D 5516, for plywood.
 2. Use treatment that does not promote corrosion of metal fasteners.
 3. Use Interior Type A High Temperature (HT), unless otherwise indicated.
- B. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

2.4 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade and any of the following species:
1. Mixed southern pine; SPIB.
- C. Other Framing: Construction or No. 2 grade Southern Yellow Pine.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction, including blocking, cants, nailers, furring, etc.
- B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 15 percent maximum moisture content and any of the following species:
1. Mixed southern pine; SPIB.
 2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.
 3. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.
- C. For exposed boards, provide lumber with 15 percent maximum moisture content using mixed southern pine, C & Btr Finish grade; SPIB.
- D. For concealed boards, provide lumber with 15 percent maximum moisture content using mixed southern pine, No. 2 grade; SPIB.

2.6 PANEL PRODUCTS

- A. Miscellaneous Concealed Plywood: Exterior sheathing, span rating to suit framing in each location, and thickness as indicated on plans but not less than 5/8" inch if none indicated.
- B. Telephone, Data and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch thick.

2.7 ANCHORS & FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture. Where carpentry is exposed to weather, in ground contact, in area of high relative humidity, provide fasteners of Type 304 stainless steel.
 - 1. Comply with International Code Council IBC Fastening Schedule Table 2304.10.1. (uon)
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: Flat head, carbon steel, ASME B18.6.1.
- E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- F. Screws or nails for fastening to pressure treated wood: Use Hot Dipped Galvanized.
- G. Lag Bolts: ASME B18.2.1.
- H. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- I. Plain Washers: Round, carbon steel, ANSI B18.22.1
- J. Lock Washer: Helical, spring type, carbon steel, ANSI B18.21.1
- K. Concrete Anchors: Where anchor type is not specifically indicated, use concrete screws or anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.
 - 3. Submit Product Data or Engineered Chart indicating the Strength of the fastener or bolt.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.
- B. Set carpentry work to required levels and lines, with members plumb and true and cut and fitted.
- C. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards.
- D. Countersink nail heads on exposed carpentry work and fill holes.
- E. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required.

3.2 WOOD GROUNDS, NAILERS, BLOCKING AND SLEEPERS

- A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
- B. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

3.3 WOOD FURRING

- A. Install plumb and level with closure strips at edges and openings. Shim with wood as required tolerance of finished work. Furring shall comply with BOCA 921.
 - 1. Firestop furred spaces on walls at each floor level and at ceiling line of top story, with wood blocking or noncombustible materials, accurately fitted to close furred spaces.
- B. Furring to Receive Plywood Paneling: Unless otherwise indicated, provide 1" x 3" furring at 2' o.c., horizontally and vertically. Select furring for freedom from knots capable of producing bent-over nails and resulting damage to paneling.

3.4 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA- registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

**TABLE 2304.10.1
FASTENING SCHEDULE**

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION
Roof		
1. Blocking between ceiling joists, rafters or trusses to top plate or other framing below	3-8d common (2 $\frac{1}{2}$ " x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, $\frac{7}{16}$ " crown	Each end, toenail
Blocking between rafters or truss not at the wall top plate, to rafter or truss	2-8d common (2 $\frac{1}{2}$ " x 0.131") 2-3" x 0.131" nails 2-3" 14 gage staples	Each end, toenail
	2-16 d common (3 $\frac{1}{2}$ " x 0.162") 3-3" x 0.131" nails 3-3" 14 gage staples	End nail
Flat blocking to truss and web filler	16d common (3 $\frac{1}{2}$ " x 0.162") @ 6" o.c. 3" x 0.131" nails @ 6" o.c. 3" x 14 gage staples @ 6" o.c	Face nail
2. Ceiling joists to top plate	3-8d common (2 $\frac{1}{2}$ " x 0.131"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, $\frac{7}{16}$ " crown	Each joist, toenail
3. Ceiling joist not attached to parallel rafter, laps over partitions (no thrust) (see Section 2308.7.3.1, Table 2308.7.3.1)	3-16d common (3 $\frac{1}{2}$ " x 0.162"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, $\frac{7}{16}$ " crown	Face nail
4. Ceiling joist attached to parallel rafter (heel joint) (see Section 2308.7.3.1, Table 2308.7.3.1)	Per Table 2308.7.3.1	Face nail
5. Collar tie to rafter	3-10d common (3" x 0.148"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, $\frac{7}{16}$ " crown	Face nail
6. Rafter or roof truss to top plate (See Section 2308.7.5, Table 2308.7.5)	3-10 common (3" x 0.148"); or 3-16d box (3 $\frac{1}{2}$ " x 0.135"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131 nails; or 4-3" 14 gage staples, $\frac{7}{16}$ " crown	Toenail ^e
7. Roof rafters to ridge valley or hip rafters; or roof rafter to 2-inch ridge beam	2-16d common (3 $\frac{1}{2}$ " x 0.162"); or 3-10d box (3" x 0.128"); or 3-3" x 0.131" nails; or 3-3" 14 gage staples, $\frac{7}{16}$ " crown; or	End nail
	3-10d common (3 $\frac{1}{2}$ " x 0.148"); or 3-16d box (3 $\frac{1}{2}$ " x 0.135"); or 4-10d box (3" x 0.128"); or 4-3" x 0.131" nails; or 4-3" 14 gage staples, $\frac{7}{16}$ " crown	Toenail

(continued)

**TABLE 2304.10.1—continued
FASTENING SCHEDULE**

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION
Wall		
8. Stud to stud (not at braced wall panels)	16d common (3 $\frac{1}{2}$ " \times 0.162");	24" o.c. face nail
	10d box (3" \times 0.128"); or 3" \times 0.131" nails; or 3-3" 14 gage staples, $\frac{7}{16}$ " crown	16" o.c. face nail
9. Stud to stud and abutting studs at intersecting wall corners (at braced wall panels)	16d common (3 $\frac{1}{2}$ " \times 0.162"); or	16" o.c. face nail
	16d box (3 $\frac{1}{2}$ " \times 0.135"); or	12" o.c. face nail
	3" \times 0.131" nails; or 3-3" 14 gage staples, $\frac{7}{16}$ " crown	12" o.c. face nail
10. Built-up header (2" to 2" header)	16d common (3 $\frac{1}{2}$ " \times 0.162"); or	16" o.c. each edge, face nail
	16d box (3 $\frac{1}{2}$ " \times 0.135")	12" o.c. each edge, face nail
11. Continuous header to stud	4-8d common (2 $\frac{1}{2}$ " \times 0.131"); or 4-10d box (3" \times 0.128")	Toenail
12. Top plate to top plate	16d common (3 $\frac{1}{2}$ " \times 0.162"); or	16" o.c. face nail
	10d box (3" \times 0.128"); or 3" \times 0.131" nails; or 3" 14 gage staples, $\frac{7}{16}$ " crown	12" o.c. face nail
	8-16d common (3 $\frac{1}{2}$ " \times 0.162"); or 12-10d box (3" \times 0.128"); or 12-3" \times 0.131" nails; or 12-3" 14 gage staples, $\frac{7}{16}$ " crown	Each side of end joint, face nail (minimum 24" lap splice length each side of end joint)
14. Bottom plate to joist, rim joist, band joist or blocking (not at braced wall panels)	16d common (3 $\frac{1}{2}$ " \times 0.162"); or	16" o.c. face nail
	16d box (3 $\frac{1}{2}$ " \times 0.135"); or 3" \times 0.131" nails; or 3" 14 gage staples, $\frac{7}{16}$ " crown	12" o.c. face nail
	2-16d common (3 $\frac{1}{2}$ " \times 0.162"); or 3-16d box (3 $\frac{1}{2}$ " \times 0.135"); or 4-3" \times 0.131" nails; or 4-3" 14 gage staples, $\frac{7}{16}$ " crown	16" o.c. face nail
16. Stud to top or bottom plate	4-8d common (2 $\frac{1}{2}$ " \times 0.131"); or 4-10d box (3" \times 0.128"); or 4-3" \times 0.131" nails; or 4-3" 14 gage staples, $\frac{7}{16}$ " crown; or	Toenail
	2-16d common (3 $\frac{1}{2}$ " \times 0.162"); or 3-10d box (3" \times 0.128"); or 3-3" \times 0.131" nails; or 3-3" 14 gage staples, $\frac{7}{16}$ " crown	End nail
17. Top or bottom plate to stud	2-16d common (3 $\frac{1}{2}$ " \times 0.162"); or 3-10d box (3" \times 0.128"); or 3-3" \times 0.131" nails; or 3-3" 14 gage staples, $\frac{7}{16}$ " crown	End nail
18. Top plates, laps at corners and intersections	2-16d common (3 $\frac{1}{2}$ " \times 0.162"); or 3-10d box (3" \times 0.128"); or 3-3" \times 0.131" nails; or 3-3" 14 gage staples, $\frac{7}{16}$ " crown	Face nail

(continued)

TABLE 2304.10.1—continued
FASTENING SCHEDULE

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION
Wall		
19. 1" brace to each stud and plate	2-8d common (2 ¹ / ₂ " × 0.131"); or 2-10d box (3" × 0.128"); or 2-3" × 0.131" nails; or 2-3" 14 gage staples, 7/16" crown	Face nail
20. 1" × 6" sheathing to each bearing	2-8d common (2 ¹ / ₂ " × 0.131"); or 2-10d box (3" × 0.128")	Face nail
21. 1" × 8" and wider sheathing to each bearing	3-8d common (2 ¹ / ₂ " × 0.131"); or 3-10d box (3" × 0.128")	Face nail
Floor		
22. Joist to sill, top plate, or girder	3-8d common (2 ¹ / ₂ " × 0.131"); or floor 3-10d box (3" × 0.128"); or 3-3" × 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	Toenail
23. Rim joist, band joist, or blocking to top plate, sill or other framing below	8d common (2 ¹ / ₂ " × 0.131"); or 10d box (3" × 0.128"); or 3" × 0.131" nails; or 3" 14 gage staples, 7/16" crown	6" o.c., toenail
24. 1" × 6" subfloor or less to each joist	2-8d common (2 ¹ / ₂ " × 0.131"); or 2-10d box (3" × 0.128")	Face nail
25. 2" subfloor to joist or girder	2-16d common (3 ¹ / ₂ " × 0.162")	Face nail
26. 2" planks (plank & beam – floor & roof)	2-16d common (3 ¹ / ₂ " × 0.162")	Each bearing, face nail
27. Built-up girders and beams, 2" lumber layers	20d common (4" × 0.192")	32" o.c., face nail at top and bottom staggered on opposite sides
	10d box (3" × 0.128"); or 3" × 0.131" nails; or 3" 14 gage staples, 7/16" crown	24" o.c. face nail at top and bottom staggered on opposite sides
	And: 2-20d common (4" × 0.192"); or 3-10d box (3" × 0.128"); or 3-3" × 0.131" nails; or 3-3" 14 gage staples, 7/16" crown	Ends and at each splice, face nail
28. Ledger strip supporting joists or rafters	3-16d common (3 ¹ / ₂ " × 0.162"); or 4-10d box (3" × 0.128"); or 4-3" × 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	Each joist or rafter, face nail
29. Joist to band joist or rim joist	3-16d common (3 ¹ / ₂ " × 0.162"); or 4-10d box (3" × 0.128"); or 4-3" × 0.131" nails; or 4-3" 14 gage staples, 7/16" crown	End nail
30. Bridging or blocking to joist, rafter or truss	2-8d common (2 ¹ / ₂ " × 0.131"); or 2-10d box (3" × 0.128"); or 2-3" × 0.131" nails; or 2-3" 14 gage staples, 7/16" crown	Each end, toenail

(continued)

**TABLE 2304.10.1—continued
FASTENING SCHEDULE**

DESCRIPTION OF BUILDING ELEMENTS	NUMBER AND TYPE OF FASTENER	SPACING AND LOCATION	
Wood structural panels (WSP), subfloor, roof and interior wall sheathing to framing and particleboard wall sheathing to framing ^a			
		Edges (inches)	Intermediate supports (inches)
31. $\frac{3}{8}$ " - $\frac{1}{2}$ "	6d common or deformed ($2" \times 0.113"$) (subfloor and wall)	6	12
	8d box or deformed ($2\frac{1}{2}" \times 0.113"$) (roof)	6	12
	$2\frac{3}{8}" \times 0.113"$ nail (subfloor and wall)	6	12
	$1\frac{3}{4}"$ 16 gage staple, $\frac{7}{16}"$ crown (subfloor and wall)	4	8
	$2\frac{3}{8}" \times 0.113"$ nail (roof)	4	8
	$1\frac{3}{4}"$ 16 gage staple, $\frac{7}{16}"$ crown (roof)	3	6
32. $\frac{19}{32}" - \frac{3}{4}"$	8d common ($2\frac{1}{2}" \times 0.131"$); or 6d deformed ($2" \times 0.113"$)	6	12
	$2\frac{3}{8}" \times 0.113"$ nail; or 2" 16 gage staple, $\frac{7}{16}"$ crown	4	8
33. $\frac{7}{8}" - 1\frac{1}{4}"$	10d common ($3" \times 0.148"$); or 8d deformed ($2\frac{1}{2}" \times 0.131"$)	6	12
Other exterior wall sheathing			
34. $\frac{1}{2}"$ fiberboard sheathing ^b	$1\frac{1}{2}"$ galvanized roofing nail ($\frac{1}{16}"$ head diameter); or $1\frac{1}{4}"$ 16 gage staple with $\frac{7}{16}"$ or 1" crown	3	6
35. $\frac{25}{32}"$ fiberboard sheathing ^b	$1\frac{3}{4}"$ galvanized roofing nail ($\frac{1}{16}"$ diameter head); or $1\frac{1}{2}"$ 16 gage staple with $\frac{7}{16}"$ or 1" crown	3	6
Wood structural panels, combination subfloor underlayment to framing			
36. $\frac{3}{4}"$ and less	8d common ($2\frac{1}{2}" \times 0.131"$); or 6d deformed ($2" \times 0.113"$)	6	12
37. $\frac{7}{8}" - 1"$	8d common ($2\frac{1}{2}" \times 0.131"$); or 8d deformed ($2\frac{1}{2}" \times 0.131"$)	6	12
38. $1\frac{1}{8}" - 1\frac{1}{4}"$	10d common ($3" \times 0.148"$); or 8d deformed ($2\frac{1}{2}" \times 0.131"$)	6	12
Panel siding to framing			
39. $\frac{1}{2}"$ or less	6d corrosion-resistant siding ($1\frac{7}{8}" \times 0.106"$); or 6d corrosion-resistant casing ($2" \times 0.099"$)	6	12
40. $\frac{5}{8}"$	8d corrosion-resistant siding ($2\frac{3}{8}" \times 0.128"$); or 8d corrosion-resistant casing ($2\frac{1}{2}" \times 0.113"$)	6	12

(continued)

SECTION 06 40 23 - INTERIOR ARCHITECTURAL WOODWORK**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Related Sections include the following:
 1. Section 06 10 00 "Rough Carpentry" for concealed wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.
 2. Division 22 Plumbing

1.3 SUMMARY

- A. This Section includes the following:
 1. Interior standing and running trim.
 2. Shop finishing of interior woodwork.
 3. Field touch up of interior woodwork.
 4. Custom Millwork.
 5. Solid Surfacing
 6. Custom wall mounted or ceiling suspended signage

1.4 INCLUSIONS

- A. Interior architectural woodwork includes exposed wood furring, blocking, shims, and hanging strips for installing woodwork items.

1.5 SUBMITTALS

- A. Shop Drawings: Comply with Section 01 33 00 "Submittal Procedures. Submit shop drawings of all millwork, cabinets and trim. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 1. Show details full size.
 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, and other items installed in architectural woodwork.
 4. Submit Apply AWI-certified compliance label to first page of Submittal.
- B. Sustainable Design Submittals
 1. Low-Emitting Materials.
 2. Volatile organic compound (VOC) content of all materials.

1.6 QUALITY ASSURANCE

The Design Intent of the Construction Documents is to include all items required for the completion of work.

- A. Installer Qualifications: As an experienced installer who has completed architectural woodwork similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Fabricator Qualifications: A firm with no less than 5 years production experience in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production and installation of interior architectural woodwork. Retain subparagraph below only for blueprint-matched work.

- D. Quality Standards: Comply with AWI's Architectural Woodwork Standards current version for grades and quality of interior architectural woodwork.
 - 1. Minimum AWS Grade: Custom.
 - 2. Submit AWI Quality Certification Program label indicating that woodwork complies with Requirements of grades specified.
 - 3. Comply with Builders Hardware Manufacturers Association for hardware quality.
- E. AWI Association Quality Assurance Program: Bidders shall be Association program participants or they shall understand that their work (fabrication only, not installation) will be inspected by an Association program representative for quality. Include in Bid the cost of inspection and all remedial work for compliance with AWS.

1.7 DELIVERIES, STORAGE, AND HANDLING

- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
 - 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 BIDDING REQUIREMENTS:

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.10 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

1.10 VOC FINISH REQUIREMENTS

- A. VOC content shall be determined according to and comply with the following limits requirements:
 - 1. Clear wood finishes, floor coatings, stains, sealers and shellacs: SCAQMD Rule 1113.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Species Transparent Finish: Appalachian Red Oak
- C. Wood Products: Comply with the following:
 - 1. Hardboard: AHA A135.4.
 - 2. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.

3. Softwood Plywood: DOC PS 1, Medium Density Overlay.
 4. Particleboard: ANSI A208.1, Grade M-2.
- D. High-Pressure Decorative Laminate: NEMA LD 3, Premium grades where indicated, or if not indicated, as required by woodwork quality standard.
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering high- pressure decorative laminates that may be incorporated into the Work include:
 - a. Formica Corporation.
 - b. Wilsonart International; Div. of Premark International, Inc.
 - c. Dupont.
 - d. Approved equal.
- E. Solid Surfacing: Product to be selected from Full Range of finishes by the following manufacturers in half inch thickness equal to:
1. Wilsonart Gibraltar or Earthstone Solid Surface
 2. Solid Surfacing by Formica Corporation
 3. Corian manufactured by the DuPont Co.
 4. Approved Equal

2.3 INSTALLATION MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors. Conceal exposed screw heads with washer or paint.
- C. Adhesives, General: Do not use adhesives that contain urea formaldehyde.
- D. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 1. Wood Glues: 30 g/L.
 2. Contact Adhesive: 250 g/L.
- E. Adhesive for Bonding Plastic Laminate: Un-pigmented contact cement.
 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.4 FABRICATION, GENERAL

- A. Interior Woodwork Grade: Provide AWS Custom grade interior woodwork for all woodwork.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- C. Fabricate woodwork to dimensions, profiles, and details indicated.
- D. Edges of Woodwork: Ease edges to radius indicated for the following:
 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch (19 mm) Thick or Less: 1/16 inch (1.5 mm).
 2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).
 3. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch (1.5 mm).
- E. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- F. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in

diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.

2.5 INTERIOR STANDING AND RUNNING TRIM FOR STAIN & TRANSPARENT FINISH

- A. Quality Standard: Comply with AWS latest Standards.
- B. Wood Species Appalachian Red Oak, as selected by Architect from samples supplied by Contractor.
- C. Flat trim items shall be closed grain hardwood. Veneered construction not acceptable.
- D. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
- E. See plans for scope and profiles.

2.6 SHOP FINISHING

- A. Grade: Provide finishes of same grades as items to be finished.
- B. General: Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.
- D. Transparent Factory Finish: Low VOC
 1. Grade: AWS Premium.
 2. AWS Finish System: Catalyzed polyurethane.
 3. Staining: Match Architect's sample.
 4. Wash Coat for Stained Finish: Apply wash-coat sealer to woodwork made from closed-grain wood before staining and finishing.
 5. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
 6. Sheen: Satin, 31-45 gloss units measured on 60-degree gloss meter per ASTM D 523.

2.7 INTERIOR STANDING AND RUNNING TRIM FOR PAINTED FINISH

- A. Quality Standard: Comply with AWS Latest Edition.
- B. Grade: Custom.
- C. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
- D. Assemble moldings in plant to maximum extent possible. Miter corners in plant and prepare for field assembly with bolted fittings designed to pull connections together.
- E. Wood Species: Any closed-grain hardwood complying with AWI quality standard indicated.

PART 3 - EXECUTION

3.1 PROJECT REQUIREMENTS

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.
- C. Wood with splits, unfilled holes or exposed fasteners is unacceptable.

3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Section 1 for the same grade specified in Part 2 of this Section for type of woodwork involved.
- B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
- C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with

countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

- E. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 96 inches (2400 mm) long, except where shorter single-length pieces are necessary.
 - 1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base, if finished.
 - 2. Install wall railings on indicated metal brackets securely fastened to wall framing.
 - 3. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).
- F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 - 2. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
- G. Complete the finishing work specified in this Section to extent not completed at shop or before installation of woodwork. Fill nail holes with matching filler where exposed. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats were applied in shop.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION

SECTION 06 41 00 - PLASTIC LAMINATE CASEWORK**PART 1 – GENERAL****1.1 RELATED DOCUMENTS**

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Section 06 40 23 Interior Architectural Woodwork
- B. Section 07 92 00 Joint Sealants
- C. Division 22 Plumbing

1.3 SUMMARY

- A. Section Includes:
 1. Plastic Laminate Casework.
 2. Hardware typically furnished by the casework manufacturer.
 3. Shelving.
 4. Structural supports incorporated into wood casework.
 5. Factory Finishing.
 6. Solid Surface or Laminate Counter-tops where shown for casework.

1.4 EXCLUDING

- A. Metal support brackets and fittings that are part of the building structure.
- B. Plumbing, electrical fixtures, and telephone equipment.

1.5 REFERENCES

- A. Minimum standards for work in this Section shall be in conformity with the *Architectural Woodwork Standards*.

1.6 SUBMITTALS

- A. Shop Drawings:
 1. Submit shop drawings in conformance with the requirements of the *Architectural Woodwork Standards*.
 2. Submit six copies, four will be returned with reviewed notations. Make corrections noted (if any), and distribute required copies prior to the start of work.
 3. Samples:
 - a. Submit four finished samples of each species and cut of wood to be used. Lumber samples to be minimum 6" by 12", and plywood samples to be minimum 12" by 12". Samples shall represent the range of color and grain expected to be provided.
 4. Mockups:
 - a. Provide mockups of one base cabinet, one wall hung cabinet, and one countertop. Base cabinet shall have at least one drawer. Mockup shall be of the material and finish to be provided. The Approved Mockup may be incorporated in the project.
- B. Sustainable Design Submittals
 1. Low-Emitting Materials.
 2. Volatile organic compound (VOC) content of all materials.

1.7 QUALITY ASSURANCE

The Design Intent of the Construction Documents is to include all items required for the completion of casework whether or not they are shown on the documents, but are inferable as being necessary to provide the intended results.

- A. Work shall be in accordance with the Grade or Grades specified of the *Architectural Woodwork Standards*.

- B. Association Quality Assurance Program. Bidders shall be current members of the Architectural Woodwork Institute. Bidders shall be Association program participants or they shall understand that their work (fabrication only, not installation) shall be inspected by an Association program representative. Include in Bid the cost of Inspection and remedial work for AWI compliance.
- C. Qualification:
 - 1. Firm (woodwork manufacturer) with no less than 5 years of production experience similar to a specific project, whose qualifications indicate the ability to comply with the requirements of this Section.
 - 2. The woodwork manufacturer must have at least one project in the past 5 years where the value of the woodwork was within 100 percent of the cost of woodwork for this Project.
- D. Single Source Responsibility: A single manufacturer shall provide and install the work of described in this Section.

1.8 BIDDING REQUIREMENTS:

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.9 DELIVERY STORAGE AND HANDLING

- A. Deliver materials only when the project is ready for installation and the general contractor has provided a clean storage area.
 - 1. Delivery of architectural millwork shall be made only when the area of operation is enclosed, all plaster and concrete work is dry and the area broom clean.
 - 2. Maintain indoor temperature and humidity within the range recommended by the *Architectural Woodwork Standards* for the location of the project.

1.10 SCHEDULING

- A. Coordinate fabrication, delivery, and installation with the general contractor and other applicable trades.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering doors that may be incorporated in the Work include, include the following:
 - 1. Casework:
 - a. Case Systems; www.casesystems.com
 - b. Memphis Plywood Corporation; www.memphisplywood.com
 - c. Approved equal in accordance with Section 01 25 00 will require sample of product.

2.2 COMPONENTS

- A. Lumber shall be in accordance with the *Architectural Woodwork Standards* Grade specified for the product being fabricated. Moisture Content shall be 6% to 12% for boards up to 2" (50.8 mm) inch nominal thickness, and shall not exceed 19% for thicker pieces.
- B. Veneers shall be in accordance with the *Architectural Woodwork Standards* requirements for its use and the Grades.
- C. Core shall be particleboard meeting the requirements of *Architectural Woodwork Standards*.
- D. Veneer core plywood shall be a non-telegraphing hardwood manufactured with exterior glue.

- E. **Plastic Laminate** shall meet the requirements of the *Architectural Woodwork Standards* for its intended use. Formica, Wilsonart

Solid Surfacing: Formica, Wilsonart or Corian, 1/2" thick unless shown otherwise on plans.

- F. Edgeband
1. Veneer of the same species and cut as the exposed surfaces.
 2. PVC 0.5mm shall be used at case bodies, and 3mm shall be used at doors, drawer fronts and false fronts.
- G. Adhesives, General: Do not use adhesives that contain urea formaldehyde. VOC Limits for Installation Adhesives and Glues: Use installation adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Wood Glues: 30 g/L.
 2. Contact Adhesive: 250 g/L.
- H. Adhesive for Bonding Plastic Laminate: Un-pigmented contact cement.
1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.3 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets in compliance with *Architectural Woodwork Standards* and the Builders Hardware Manufacturers Association Standard ANSI/BHMA A156.9 Cabinet Hardware.
- B. Frameless Concealed Hinges European Type: 110 degrees of opening, self-closing. (min. 2 per door and as needed to prevent door from sagging)
- C. Wire Pulls: Back mounted, solid metal 4 inches (101 mm) long, 2-1/2 inches (63.5 mm) deep, and 5/16 inch (8 mm) in diameter, satin chrome plated. (1 per door)
- D. Catches: Magnetic catches, BHMA A156.9, B03141. (1 per door)
- E. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.
- F. Drawer Slides: BHMA A156.9, B05091.
1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; 3/4 extension type; zinc-plated steel ball-bearing slides with 100 lb. rating.
- G. Door Locks: BHMA A156.11, E07121. (1 per door)
- H. Drawer Locks: BHMA A156.11, E07041. (1 per drawer)
- I. Grommets for Cable Passage through Countertops: 2-inch (51-mm) OD, color as selected, molded-plastic grommets and matching plastic caps with slot for wire passage. (1 per receptacle or data jack-see electrical sheets for number)
- J. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
1. Satin Stainless Steel: BHMA 630.
- K. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.
- L. Shelf Supports: (Adjustable): Line-bored by millwork supplier, complete with cushioned 2 hole support pins. Adjustable on 32mm centers supported by 300 lb. capacity clear polycarbonate shelf supports in 5mm holes.

2.4 FABRICATION

- A. Plastic Laminate Casework:
1. Shall be *Architectural Woodwork Standards* Custom.
 2. Exposed interior surfaces shall be low pressure melamine overlay.
 3. Semi-exposed surfaces shall be low-pressure melamine overlay.
 4. Doors, drawer fronts, and false fronts shall be Style 1 flush overlay.
 - a. Edgeband at doors, drawer fronts, and false fronts shall be 3mm PVC

- B. Drawers shall meet the requirements of the *AWS* for the Grade or Grades specified.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify the adequacy and proper location of any required backing or support framing.
- B. Verify that mechanical, electrical, plumbing, and other building components affecting work in this Section are in place and ready.

3.2 INSTALLATION

- A. Install all work in conformance with the *Architectural Woodwork Standards*, latest edition.
 - 1. Installation shall conform to the *AWS* Grade of the items being installed.
- B. All work shall be secured in place, square, plumb, and level.
All work abutting other building components shall be properly scribed.
- C. Mechanical fasteners used at exposed and semi-exposed surfaces, excluding installation attachment screws and those securing cabinets end to end, shall be countersunk.
- D. Equipment cutouts shown on plans shall be cut by the installer.

3.3 ADJUSTING & TOUCH UP

- A. Before completion of the installation, the installer shall adjust all moving and operating parts to function smoothly and correctly.
- B. All nicks, chips, and scratches in the finish shall be filled and retouched. Damaged items that cannot be repaired shall be replaced.

3.4 CLEANUP

- A. Upon completion of installation, the installer shall clean all installed items of pencil and ink marks and broom clean the area of operation, depositing debris in containers provided by the general contractor.

END OF SECTION

SECTION 06 61 19 QUARTZ SURFACE FABRICATIONS

PART 1 — GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this Section.

1.2 SUMMARY

- A. This Section includes the following horizontal & vertical quartz surface product types:
 - 1. Countertops for Restrooms.
 - 2. Countertops for millwork in Areas where indicated.
 - 3. Wall Surfaces where indicated on plans.

- B. Related Sections include the following:
 - 1. Division 5 Section "Metal Fabrications" for Blocking.
 - 2. Division 6 Section "Interior Architectural Woodwork"
 - 3. Division 6 Section "Plastic Laminate Casework"
 - 4. Division 22 Section "Plumbing Fixtures."
 - 5. Division 26 Section "Wiring Devices."

- C. Subcontract: This Contractor has the option to Bid all or part of this Work to the Millwork or General Contractor but the Work must be coordinated with Carpentry & Millwork Sections.

1.3 SUBMITTALS

- A. Product data:
 - 1. For each type of product indicated.

- B. Shop drawings:
 - 1. Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
 - a. Show the following:
 - 1) Full-size details, edge details, attachments, etc.
 - 2) Locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
 - 3) Locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items installed in quartz surface.
 - 4) Seam locations.

- C. Samples:
 - 1. For each type of product indicated:
 - a. Submit minimum 6-inch by 6-inch sample in specified color.
 - b. Cut sample and seam together for representation of seaming techniques.
 - c. Indicate full range of color and pattern variation.
 - 2. Approved samples will be retained as a standard for work.

- D. Product data:
 - 1. Indicate product description, fabrication information and compliance with specified performance requirements.

- F. Product certificates:
 - 1. For each type of product, signed by product manufacturer.

- G. Fabricator/installer qualifications:
 - 1. Provide copy of certification number.

- H. Manufacturer certificates:
 - 1. Signed by manufacturers certifying that they comply with requirements.

- I. Maintenance data:
 - 1. Submit manufacturer's care and maintenance data.
 - a. Maintenance kit for finishes shall be submitted.
 - 2. Include in project closeout documents.

1.4 QUALITY ASSURANCE

The Design Intent of the Construction Documents is to include all items required for the completion of Quartz Surface work.

- A. Qualifications:
 - 1. Shop that employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance.
- B. Fabricator/installer qualifications:
 - 1. Work of this section shall be by a certified fabricator/installer, certified in writing by the manufacturer.
- C. Applicable standards:
 - 1. Standards of the following, as referenced herein:
 - a. American National Standards Institute (ANSI)
 - b. American Society for Testing and Materials (ASTM)
 - 2. Fire test response characteristics:
 - a. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E 84) or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - b. Flame Spread Index: 25 or less.
 - c. Smoke Developed Index: 450 or less.
- D. Allowable tolerances:
 - 1. Variation in component size: $\pm 1/8"$ (3 mm) over a 10' length.
 - 2. Location of openings: $\pm 1/8"$ (3 mm) from indicated location.
 - 3. Maximum $1/8"$ (3 mm) clearance between quartz surfaces and each wall.
- E. Job mock-up:
 - 1. Prior to fabrication of architectural millwork, erect sample unit to further verify selections made under sample submittals and to demonstrate the quality of materials and execution.
 - 2. Mock-up shall be for each type installation, including counter, bowl, wall surface.
 - 3. Build the mock-up to comply with the contract documents and install in a location as directed by the architect.
 - 4. Notify the architect two weeks in advance of the date of when the mock-up will be delivered.
 - 5. Should mock-up not be approved, re-fabricate and reinstall until approval is secured.
 - a. Remove rejected units from project site.
 - 6. After approval, the mock-up may become a part of the project.
 - 7. This mock-up, once approved, shall serve as a standard for judging quality of all completed units of work.
- G. Pre-installation conference:
 - 1. Conduct conference at project site to comply with requirements in Division 1.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver no components to project site until areas are ready for installation.
- B. Store components indoors prior to installation.
- C. Handle materials to prevent damage to finished surfaces.
 - 1. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.6 WARRANTY

- A. Provide manufacturer's 10-year warranty against defects in materials.
 - 1. Warranty shall provide material to repair or replace defective materials.
 - 2. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

- 1.7 MAINTENANCE
 A. Provide maintenance requirements as specified by the manufacturer.

1.8 BIDDING REQUIREMENTS:

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@LandAIA.com

PART 2 — PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the requirements, provide the following product:
1. Hanstone by Hanwha www.hanwhasurfaces.com (basis of design)
 2. Cambria, www.CambriaUSA.com
 3. Prior Approved Equal

2.2 MATERIALS

- A. Material:
1. Homogeneous quartz surfaces material containing 93% pure quartz with high performance polyester resin and pigment.
 2. Material shall have minimum physical and performance properties specified.
- B. Thickness:
1. 2 cm (3/4") for vertical installation on wall or millwork.
- C. Edge treatment:
1. Standard Bevel Square Edge
- D. Seam width:
1. <1/8" unless otherwise specified.
- E. Sink mounting:
1. Undermount porcelain. Sink by Division 22.
- F. Performance characteristics: physical properties data sheet:

Property	Typical Result	Test Procedure
Flexural Strength	>5,300 psi	ASTM D 790
Flexural Modulus	5.3–5.7E ⁶ psi	ASTM D 790
Flexural Elongation	>0.1%	ASTM D 790
Compression Strength (Dry)	~27,000 psi	ASTM C 170
Compression Strength (Wet)	~24,000 psi	ASTM C 170
Hardness	7	Mohs' Hardness
Scale		
Thermal Expansion	1.45 x 10 ⁻⁵ in./in./°C	ASTM D 696
Gloss (60° Gardner)	45–50	ANSI Z 124
Colorfastness	Passes	ANSI Z 124.6.5.1
Wear and Cleanability	Passes	ANSI Z 124.6.5.3
Stain Resistance	Passes	ANSI Z 124.6 (stain 5.2, chemical 5.5, cigarette 5.4 resistances)
Fungal and Bacterial Resistance	No growth	ASTM G 21 & G 22
High Temperature Resistance (356°F)	None to slight effect	NEMA LD 3.3.6*
Boiling Water Resistance	None to slight effect	NEMA LD 3.3.5*
Freeze-Thaw Cycling	Unaffected	ASTM C 1026
Point Impact	Passes	ANSI Z 124.6.4.2

Ball Impact	164 inches	NEMA LD 3.3.8*
Slip Resistance	Above 0.80 for textured models	ASTM C 1028
Static Coefficient of Friction (as received)	0.89/0.61 (wet/dry)	ASTM C 1028
Static Coefficient of Friction (with renovator)	0.87/0.65 (wet/dry)	ASTM C 1028
Abrasion Resistance	139	ASTM C 501
Specific Gravity	2.44	ASTM D 792
Density	~2400 kg/m ³	
Water Absorption	0.12%	ASTM C 373
Long- and Short-Term	<0.04%	ASTM D 570
Moisture Expansion	<0.01% on average	ASTM C 370
Toxicity	Passes, LC50=68–128	Pittsburgh
Protocol		
Flammability	For all colors tested	ASTM E 84, UL 723 and NFPA 255
	(Class I and Class A)	
Flame Spread Index	FSI <10 for 3 cm and <15 for 2 cm	
Smoke Developed Index	SDI <50 for 3 cm and <100 for 2 cm	
Nominal Thickness	2 cm and 3 cm	
Nominal Weight	10 lb./ft. ² (2 cm) 15 lb./ft. ² (3 cm)	

2.3 ACCESSORY PRODUCTS

- A. Joint adhesive:
 1. Manufacturer-approved adhesive to create color-matched seam around all perimeter and internal joints.
- B. Sink/bowl mounting hardware:
 1. Manufacturer's approved bowl clips, brass inserts and fasteners for attachment of undermount sinks/bowls.
- C. Wall adhesive:
 1. Manufacturer-approved epoxy or polyester adhesive to secure quartz to wall as recommended by quartz manufacturer for application and conditions of use.
- D. Mechanical fasteners:
 1. Manufacturer-approved fasteners where adhesive fasteners will not suffice.
- E. 2" Dia. Rubber grommet at each work station and no less than 1 per 48" along counter. Submit locations with Shop Drawings.

2.4 FACTORY FABRICATION

- A. Shop assembly
 1. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
 2. Form joints between components using manufacturer's standard joint adhesive joints.
 - a. Reinforce as required.
 3. Provide factory cutouts for plumbing fittings and bath accessories as indicated on the drawings.
 4. Rout and finish component edges with clean, sharp returns.
 - a. Rout cutouts, radii and contours to template.
 - b. Smooth edges.

2.5 FINISHES

- A. Select from the manufacturer's full range from standard color chart.

PART 3 — EXECUTION

3.1 INSTALLATION

- A. Install components plumb and level, in accordance with approved shop drawings and product installation details.
 - 1. Tops:
 - a. Flat and true to within 1/8" (3 mm) of a flat surface over a 10' length.
 - b. Allow a minimum of 1/16" to a maximum of 1/8" (3 mm) clearance between surface and each wall.
- B. Form field joints using manufacturer's recommended adhesive, with joint widths no greater than 1/8" (3 mm) in finished work.
 - 1. Keep components and hands clean when making joints.
- C. Sinks:
 - 1. Adhere undermount sinks/bowls to countertops using manufacturer's recommended adhesive and mounting hardware.
- D. Seal all perimeter edges at wall surfaces using manufacturer's standard color-matched silicone sealant.
- E. Vertical Surface: Apply continuous bead of mounting adhesive around perimeter and 1/4" mounting adhesive bead every 8" on vertical centers. Use fastening hardware or other components as recommended by manufacturer for secure installation.
- F. Keep components and hands clean during installation.
 - 1. Remove adhesives, sealants and other stains.
 - 2. Components shall be clean on date of substantial completion.

3.2 WATER CUTTING

- a. All cutting is to be done with waterjet technology.
- b. Tolerance between cuts is to be 1/32 of an inch.
- c. Includes cutting and assembly of the designs, and the field that surrounds.

3.3 CLEANING AND PROTECTION

- A. Keep components clean during installation.
 - 1. Remove adhesives, sealants and other stains.
- B. Protect surfaces from damage until date of substantial completion.
 - 1. Replace damaged work.

END OF SECTION

SECTION 07 10 11 - VAPOR BARRIER & WALL FLASHING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.02 SCOPE

Provide and install all vapor barriers, and wall flashings where indicated on drawings and specified herein.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. General & Supplementary Conditions, Special Requirements
- B. Cast-In-Place Concrete: Division 3
- C. Painting: Section 09 90 00
- D. Metal Flashing - Section 07 62 00

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store materials above ground on level platforms in unopened containers. cover and store in approved manner which will protect them from weather exposure.

PART 2 - PRODUCTS

2.01 UNDER ALL FLOOR SLABS - VAPOR BARRIERS- IF NOT SHOWN ON ENGINEERS PLANS

- A. Densely structured, heavy duty single ply 6 mil thick net (0.060) vinyl plastic sheet, in widest practical seamless width. Film Guard by Carlisle Plastics or Warp Brothers Sunbelt with taped seams.

2.02 THRU WALL FLASHING

- A. Self Adhesive Sill flashing at sill of foundation, lintels, wall openings, etc.. Use self adhesive 40 mil. min. composite membrane material. Lap & seal inside & outside corners watertight. H&B Flex-Flash Flashing by Hohman & Bernard or Equal by Heckman. Use primer where recommended.

2.03 WINDOW TAPE

- A. Tear resistant self adhesive, self sealing tape for new window jamb, head, sill. Product Equal to MFM Building Products SubSeal 40. A tough, multi-layer, cross-laminated film that is coated with an aggressive rubberized asphalt adhesive system. Tape must be compatible with weather barrier and meet AAMA 711-13. See drawing for application sequence.

2.04 ADHESIVES

- A. As recommended by flashing manufacturer for weather resistant seaming and adhesive application of each product. Lay material in adhesive, use adhesive to seal all joints, laps, punctures. Lap joints 4". Slope material towards weep.

PART 3 - EXECUTION

3.01 PREPARATION AND INSTALLATION

Install all products in accordance with manufacturer's instructions and recommendations. At completion, all surfaces shall be watertight.

- A. UNDER GRADE SLABS: Over leveled fill material under all floor slabs on grade, place one layer of membrane material, lapping edges at least 6". Lap and seal joints with duct tape per manufacturers instruction.. Seal around all penetrations and tears with tape per manufacturers instruction.
- B. WALL FLASHING AND DAMPCOURSE: Where shown on drawings and at all exterior walls, under masonry sills, over lintels and steel shelf angles provide weathertight flashing.
 - 1. Apply where concealed wall flashing is indicated; at head, sills of exterior masonry openings; under sheet metal coping; as otherwise indicated.
 - 2. Install at foundation sill, base where shown.
 - 3. Masonry Openings: at heads and sills of openings; at heads and sills turn up ends to form pans, with corners folded, not cut.
 - 4. Flashing for Horizontal Masonry Surfaces: laid in slurry or fresh mortar, topped with fresh full bed of mortar.
 - 5. Flashing for Vertical Masonry Surfaces: laid on surfaces, sufficiently spotted with mastic to hold flashing in place until masonry is set.
 - 6. Joints: lapped at least 4"; contact surfaces coated with mastic or sealant.

END OF SECTION

SECTION 07 17 00 - BENTONITE WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. The work of this section includes, but is not limited to the furnishing and installing the following materials, per project specifications and drawings, or as directed by bentonite waterproofing manufacturer:
 - 1. Sodium bentonite geotextile sheet waterproofing membrane with all applicable accessory products to be provided at elevator pits as shown on drawings and as needed for complete waterproofing of elevator pits.
- B. The Design Intent of the Construction Documents is to include all items required for the completion of Bentonite Waterproofing work whether detailed or inferable as being necessary to provide the intended results.

1.3 SYSTEM DESCRIPTION

- A. Provide bentonite waterproofing and prefabricated drainage composite system to prevent the passage of liquid water and install without defects, damage or failure. Waterproofing shall be two high strength geotextiles interlocked encapsulating minimum 1.10 lbs. per square foot granular sodium bentonite.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's product data with complete general and specific installation instructions, recommendations and limitations.
- B. Material Certificates: Submit certificate(s) signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements. Submit certification that waterproofing system and components, drainage and protection materials are supplied by a single-source manufacturer.
- C. Warranty: Submit Manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Warranty: Submit Manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- B. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field installation to establish procedures to maintain required working conditions and to coordinate this work with related and adjacent work. Verify that final waterproofing and waterstop details comply with waterproofing manufacturer's current installation requirements and recommendations. Pre-con meeting attendees should include representatives for the owner, architect, inspection firm, general contractor, waterproofing contractor, concrete contractor, excavating/backfill contractor, and mechanical and electrical contractors if work penetrates the waterproofing.
- C. Materials: Obtain bentonite geotextile waterproofing and prefabricated drainage materials from a single manufacturer to assure material compatibility.
- D. Water Sample Test: Project site water sample supplied to manufacturer by waterproofing contractor to determine type of bentonite system (standard sodium bentonite or contaminate resistant (CR) sodium bentonite) to be utilized on the project.
 - 1. Manufacturer shall conduct test free of charge. Contractor is responsible for collection and shipment of one liter of actual site water. Water should be shipped in uncontaminated, sealed plastic container.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Handling: Deliver materials in factory sealed and labeled packaging. Sequence deliveries to avoid delays, while minimizing on-site storage. Handle and store following manufacturer's instructions, recommendations and material safety data sheets. Protect from construction operation related damage and prolonged weather exposure. Remove damaged material from site and dispose of in accordance with

applicable regulations.

- B. Storage: Do not double-stack pallets during shipping or storage. During storage protect waterproofing materials from moisture, excessive temperatures and sources of ignition. Provide cover, top and all sides, for materials stored on-site, allowing for adequate ventilation.

1.7 PROJECT CONDITIONS

- A. Substrate Condition: Proceed with work only when substrate construction and preparation work is complete and in condition to receive waterproofing system.
- B. Weather Conditions: Perform work only when existing and forecasted weather conditions are within the guidelines established by the manufacturer of the waterproofing materials. Do not apply waterproofing materials into standing water or over ice and snow. General Contractor shall maintain site conditions to remove standing water from precipitation or ground water seepage in a timely manner. Should bentonite sheets be subjected to prehydration as a result of prolonged immersion, inspection of the material and written acceptance from the manufacturer is required prior to concrete or backfill placement

1.8 WARRANTY

- A. Waterproofing Warranty: Upon completion and acceptance of the work required by this section, the waterproofing materials manufacturer will provide a written five (5) year warranty from the time of Substantial Completion, agreeing to promptly provide all materials and labor to replace defective materials.

1.9 BIDDING REQUIREMENTS:

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The Geotextile/Bentonite clay waterproofing membrane shall be provided by the following manufacturers:
 - 1. CCW MiraCLAY supplied by Carlisle Coatings & Waterproofing Inc. 800.527.7092
 - 2. VOLCLAY Panels as manufactured by COLLOID Environmental Technologies Co. (CETCO) 847.392.5800
 - 3. Prior Approved Equal.
- B. Physical Properties for Geotextile/Bentonite Clay Waterproofing Membrane: Physical Properties:

<u>Property</u>	<u>TestMethod</u>	<u>Value</u>
Bentonite Content	—	1.0 lb./ft ² (.488 ka/m ²)*
Nominal Dry Thickness	—	0.25 in. (6.4 mm)
Weight	—	75 lb. (34.05 kg)
Permeability	ASTM D 5084	5 x 10 ⁻⁹ cm/sec
Grab Tensile Strength	ASTM D 4632	95 lb. (422 N)
Grab Elongation	ASTM D 4632	150%
Puncture Resistance	ASTM D 4833	120 psi (828 kPa)
Hydrated Internal Shear	ASTM D 5321	500 psf (24 kPa)
Swell Index	ASTM D 5890	2g (24 ml) min.
Fluid Loss	ASTM D 5891	18 ml max

*@ 12% moisture content

- C. Waterproofing system accessories supplied by waterproofing membrane manufacturer:
 - Mastic: CCW MiraCLAY Mastic or VOLCLAY Bentoseal is used for detailing at terminations and penetrations. Also used to fill minor voids in concrete and as a fillet in angle changes.
 - Granules: CCW MiraCLAY Granules or VOLCLAY Waterstoppage used for horizontal to vertical transitions and for detailing at seams and slab penetrations.

- Waterstop: CCW MiraSTOP or VOLCLAY Hydrobar Tubes used as a waterstop at cold concrete pours, shotcrete cold joints and between pre-cast concrete panels.
- D. Membrane to Substrate Fasteners: Fasteners, of the type and length suitable for the substrate, shall be used in conjunction with washers, of at least 1" diameter, to attach the geotextile/bentonite clay waterproofing membrane to the substrate.
 - E. Membrane to Membrane Fasteners: Mechanically fasten membrane sheets together with a box-stapler or similar device for horizontal applications.
 - F. The Geotextile/Bentonite membrane shall consist of geotextile panels of sodium bentonite clay sandwiched between two layers of needle-punched woven and non-woven polypropylene fabrics. (MIRACLAY Panels OR VOLCLAY Panels)
 - G. Termination Bar: Min. 1" (25 mm) wide aluminum bar with pre-punched holes on 12" (300 mm) centering for fastening.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with contract documents and manufacturer's product data, including product application and installation instructions.

3.2 SUBSTRATE INSPECTION AND CONDITIONS

- A. Examine conditions of substrates and other conditions under which this section work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected and are acceptable for compliance with manufacturer's warranty requirements. General substrate conditions acceptable for the waterproofing installation are listed below. For conditions not covered in this Section, contact the waterproofing manufacturer for guidance.
- B. Soil Substrates: Site conditions allowing, applications do not require a mud-working slab. Grade substrates should consist of well-leveled soils without voids and debris, and compacted to a minimum of 85% Modified Proctor density. If substrate consists of large aggregate, place a high-strength geotextile layer over the aggregate and then provide several inches of compacted soil or sand for uniform support and containment of waterproofing sheets.
- C. Concrete: Reinforced structural slabs should be a minimum of 6" thick when placed on a working mud slab. Reinforced concrete slab(s) on compacted grade shall be a minimum of 4" thick. When hydrostatic conditions exist, install bentonite under all footings, elevator pits and grade beams. Cast-in-place concrete to receive waterproofing shall be of sound structural grade with a smooth finish, free of debris, oil, grease, laitance, dirt, dust, or other foreign matter which will impair the performance of the waterproofing and drainage system and which do not comply with manufacturer's warranty requirements. Bentonite can be installed on green structural concrete as soon as the forms are removed. There is no product limitation regarding a minimum concrete curing time requirement for bentonite waterproofing to be installed over structural concrete.

3.3 SURFACE PREPARATION

- A. Remove dirt, debris, oil, grease, cement laitance, or other foreign matter which will impair or negatively affect the performance of the waterproofing and drainage system.
- B. Protect adjacent work areas and finish surfaces from damage or contamination from waterproofing products during installation operations.

3.4 GENERAL INSTALLATION GUIDELINES

- A. Prevent geotextile/bentonite clay waterproofing membrane from hydrating before being covered with overburden. When threat of rain is imminent or backfill is not immediate, geotextile/bentonite clay waterproofing membrane should be covered with polyethylene sheeting.
- B. Elevator Pit Wall Application:
 - 1. Install membrane with the white non-woven side out, facing the installer.
 - 2. Starting at the bottom of the wall, unroll membrane and secure across top of panel one fastener per 12" (31cm) on center. Allow sheet to hang down fastening only as required to stabilize.
 - 3. Install adjacent membrane by overlapping edges a minimum of 4" (10cm).

4. Fasten membrane once every 18" (45cm) on seams or as required to prevent blousing with 3/4" (20mm) to 1" (25mm) concrete nails with washers.
5. Extend waterproofing membrane to 6-inches below grade and fasten membrane to the substrate to maintain constant compression using a 1/8" X 1" (3 X 25 mm) minimum termination bar. Trowel a 1/2" (12mm) thick and 2" (5cm) wide bead of mastic at top edge of membrane and cover termination bar.
6. Create a cant at any vertical to horizontal transition by applying a 1.5" to 2" (4cm to 5cm) cant of granules or mastic.
7. Strip in all corners and transitions with a 12" to 15" (31cm to 39cm) piece of membrane to double cover these areas.

3.5 BACKFILL EXCAVATED CAST-IN-PLACE CONCRETE WALLS

- A. Closely coordinate bentonite sheet installation with Backfill conducted under Division 3123 00 work. Care should be used during backfill operation to avoid damage to the waterproofing system. Follow generally accepted practices for backfilling and compaction. Backfill should be added in 6" to 12" (150 - 300 mm) lifts and compacted to a minimum 85% Modified Proctor density.

3.6 CLEAN UP

- A. Clean areas where adjacent finished surfaces are soiled by work of this Section. Remove all tools, equipment and remaining product on-site. Dispose of section work debris and damaged product following all applicable regulations.

END OF SECTION

SECTION 07 21 00 – THERMAL INSULATION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.
- B. Related Sections include the following:
 - 1. Section 07 92 00 "Joint Sealants" for coordination of Building Thermal Envelope Air Sealing.
 - 2. Section 09 29 00 "Gypsum Board" for installation in metal-framed assemblies of insulation specified by reference to this Section.
 - 3. Division 21,23 & 26 Sections for Mechanical, Electrical and Plumbing Insulation.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Batt fiberglass insulation where indicated in interior walls, exterior walls, ceilings & elsewhere.
 - 2. Foam insulation for filling voids in building shell & around penetrations.

1.3 PERFORMANCE REQUIREMENTS

- A. The Design Intent of the Contract Documents includes the following:
 - 1. Grade 1 Insulation Installation including a continuous uninterrupted rigid insulation membrane from the top of slab to the top of wall below roof so as to completely encapsulate the entire conditioned areas of the building. Install foam insulation around all penetrations in insulation board and between all joints so that a complete thermal air seal is provided in exterior walls. Air permeable insulation shall be sealed on 6 sides. Cavity insulation is fitted tightly around penetrations.
 - 2. All items required for the completion of work. Therefore, all items necessary for the completion of work shall be required whether or not they are shown on the documents, but are inferable as being necessary to provide the intended results.

1.4 REFERENCES

- A. ASTM International Publications:
 - 1. C578 "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation"
 - 2. C665 "Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing"
 - 3. D4397 "Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications"
 - 4. E84 "Standard Test Method for Surface Burning Characteristics of Building Materials"
 - 5. E96 "Standard Test Methods for Water Vapor Transmission of Materials"
 - 6. E119 "Standard Test Methods for Fire Tests of Building Construction and Materials"
 - 7. E1677 "Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls"

1.5 SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Product Test Data and Evaluation Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.
- C. Product test reports from and based on tests performed by qualified independent testing laboratory evidencing compliance of insulation products with requirements including r-values (aged-values for plastic foam insulations), fire performance characteristics, perm ratings, water absorption ratings and other properties, based on comprehensive testing of current products.

- D. Research reports or evaluation reports of the model code organization acceptable to authorities having jurisdiction that evidence compliance of plastic foam insulations with building code in effect for Project.

1.6 QUALITY CONTROL

- A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the work.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 1. Surface-Burning Characteristics: ASTM E 84.
 2. Fire-Resistance Ratings: ASTM E 119.
 3. Combustion Characteristics: ASTM E 136.
- C. Insulation shall meet all requirements of International Building Code 2009 and NFPA 101 . All insulation shall have a flame spread of 0-25 and a smoke developed rating of 0-450 in accordance with IBC.
- D. Mock Ups: Provide 4' x 4' mockup of product system for each system condition for review & approval by Architect. Give Architect 7 days notice prior to review. Remove mockup if requested by architect.
- E. Blow -In-Blanket installer shall be approved by manufacturer for installation

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Wet insulation shall be unacceptable and replaced.

1.8 PROJECT CONDITIONS

- A. The Installer must examine the substrate and the conditions under which insulation work is to be performed and notify the Architect in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
- B. Weather Conditions: Proceed with work only when weather conditions are in compliance with manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with requirements and the manufacturer's recommendations.
- C. Do not apply insulation to damp, frozen, dirty, dusty, or surfaces unacceptable to manufacturer.
- D. Coordinate this work with all trades and protect it after installation.

1.9 BIDDING REQUIREMENTS:

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
 1. Glass-Fiber Batt Insulation:
 - a. CertainTeed Corporation.
 - b. Owens Corning.
 - c. Johns Manville.
 - d. Knaff Fiber Glass.
 - e. Approved equal.

2. Rigid Insulation Board:
 - a. Dow
 - b. GreenGuard
 - c. Owens Corning
 - d. Approved equal.

3. Glass-Fiber Blown Insulation:
 - a. CertainTeed Corporation
 - b. Johns Manville
 - c. Knaff Fiber Glass.
 - d. Approved equal.

2.2 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
 1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.
 2. Flame Spread less than 75 for concealed and 25 for exposed, with a smoke developed of less than 450 maximum.

- B. Unfaced Glass-Fiber Blanket Insulation: ASTM C 665, Type I; consisting of mineral fiber mat, passing ASTM E 136 for combustion characteristics. Thermal resistance ("R-Value") of 4 per inch of thickness.
 1. Thickness in walls as determined by framing members and wall cavity as shown on the plans.
 2. **Fiberglass Batt insulation required in all open wall cavities between conditioned and unconditioned space such as exterior walls, sound walls, walls separating conditioned spaces with voids above ceilings, rated walls. Install unfaced R19 fiberglass above ceiling tiles that are shown to be replaced and R 13 unfaced fiberglass in new walls around bathrooms, offices & Podcast Room. REFER TO PARTITION PLAN SHEET A6.1 for additional requirements.**
 3. Install fiberglass batt insulation above all new & existing restroom ceilings for sound control.

- C. Rigid Insulation Board: ASTM C 578 Type IV, Consisting of extruded polystyrene foam insulation board (r-value 3.85 min per inch.) at 75 degree F. Ship Lap groove Edge Treatment w/ tape. See Plans for Thickness indicated. **(Patch work only)**
 1. Available Products that may be incorporated into the Work include the following:
 - a. Owens Corning Foamular 150
 - b. Dow Styrofoam Cavitymate SC (Blue) Insulation
 - c. Equal by the manufacturers listed in 2.1 above
 - d. Approved Equal
 2. Include joint sealant as recommended by insulation board manufacturer for filling all gaps.
 3. Include Owens Corning JointSealR tape for sealing all joints between insulation boards and around all penetrations in insulation board.

- D. ~~Block Fill Insulation~~ **For all new block walls between conditioned and non conditioned areas.**
 - A. ~~Basis of Design: Core Foam Masonry Foam Insulation by CfiFOAM, Inc., P.O. Box 10393, Knoxville, TN 37939. Phone: (865) 588-4465.~~
 - B. ~~Applegate C Foam Insulation by Applegate Foam Insulation, Inc., 3335 Lincoln Road, Hamilton, MI 49419. Phone: (855) 949-2775.~~
 - C. ~~Equal per Section 01 25 00.~~

- E. Can Foam Insulation: Products Equal to:

- a. GREAT STUFF™ Gaps & Cracks* — Foam sealant that expands to seal and insulate gaps up to one inch.
- b. GREAT STUFF™ Window & Door* — Minimally expanding foam that seals between a window or door and its rough opening.
- c. GREAT STUFF™ Fireblock* — Impedes spread of fire and smoke through service penetrations.
- d. GREAT STUFF™ Big Gap Filler* — Foam sealant that expands to seal and insulate gaps up to three inches.
- e. GREAT STUFF™ Pestblock* — Blocks pests out of the home by eliminating points of entry.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.
 - 1. Verify adjacent materials are dry and ready to receive insulation.
 - 2. Verify mechanical and electrical services within insulated spaces have been installed and tested.
 - 3. Verify substrate surface is flat, free of honeycomb, fins, irregularities, and materials that will impede adhesive bond.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.
- B. Close off openings in cavities to prevent escape of insulation.

3.3 INSTALLATION

- A. Comply with manufacturer's written instructions applicable to insulation products and application indicated. Fit tightly between framing.
- B. Install insulation that is undamaged, unbroken, dry, and unsoiled. Protect from rain, snow and ice.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.
- E. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- F. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids. Install kerf in insulation to sandwich conduit, piping and metal bridging in wall.
- G. Install foam insulation in all seams of rigid insulation board that are not tightly fit. Shave off excess for smooth surface prior to insulation tape application. Install foam insulation in all other joints, gaps penetrations in insulation board and leave smooth and clean ready for joint seal tape.
- H. Install joint seal tape over all edge joints in insulation board and over all punctures and penetrations in insulation board.
- G. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Do not obstruct ventilation spaces, except for firestopping. Tape joints and ruptures in rigid insulation and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
- C. Install fiber blankets in cavities formed by framing members according to the following requirements:
 - 1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.

3.5 INSTALLATION OF BLOWN FIBERGLASS INSULATION

- A. Install insulation in accordance with manufacturer's instructions.
- B. Pneumatically place insulation in between framing members to full Depth of stud or cavity being careful to obtain density around all penetrations and piping, etc.
- C. Fill spaces without gaps or voids. Place tight to mechanical and electrical services.

3.6 ADJUSTING

- A. Inspect areas for complete coverage; fill voids.

END OF SECTION

SECTION 07 21 19

SPRAY FOAM INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

BIDDING REQUIREMENTS

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

DESCRIPTION OF WORK

- A. Foamed-In-Place insulation for thermal performance.

~~**OPEN CELL** – Provide Open Cell where indicated on plans.. Completely cover with exposed foam (R38) on bottom of roof with 2 coats of intumescent paint to satisfy Fire Marshal requirements.~~

CLOSED CELL – Provide Closed Cell (R25) to bottom of existing roof deck over existing 2nd Floor only where no acoustic ceilings are indicated - Completely cover with 2 coats of intumescent paint to satisfy Fire Marshal requirements.

1.2 SUMMARY

- A. Section Includes: Light density, open celled, flexible, 100 percent water blown polyurethane foam insulation.
- B. Related Sections:
 - 1. Division 07 Section 07 21 00 Thermal insulation
 - 2. Divisions 21 through 23 Mechanical Documents
- C. Coordinate mechanical ventilation and fresh air supply with Mechanical sections and ASHRAE Guidelines for optimum indoor air quality.

1.3 REFERENCES

- A. American Society for Testing and Materials International (ASTM)
 - 1. ASTM C 518: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
 - 2. ASTM C 1338: Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings
 - 3. ASTM E 84: Test Method for Surface Burning Characteristics of Building Materials

4. ASTM E 96: Standard Test Methods for Water Vapor Transmission of Materials
5. ASTM E 2178: Standard Test Method for Air Permeance of Building Materials

1.4 SUBMITTALS

- A. Product Data for each type of insulation product specified.
- B. Product test reports performed by a qualified independent testing agency evidencing compliance of insulation products with specified requirements including those for thermal resistance, fire-test-response characteristics, water-vapor transmission, water absorption, and other properties, based on comprehensive testing of current products.
- C. Evaluation Report: Evidence of compliance of foam-plastic insulations with International Building Code (IBC), International Residential Code (IRC), International Energy Conservation Code (IECC).
- D. Manufacturer's certificate certifying insulation provided meets or exceeds specified requirements.
- E. Installer's certificate showing the Icynene installation certification.
- F. Sample warranty

1.5 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Product produced in an ISO9001 registered factory.
- B. Single Source Responsibility: Single source product from one manufacturer.
- C. Installer Qualifications: Engage an Icynene Licensed Dealer (applicator) who has been trained and certified by Icynene.
- D. Fire-Test-Response Characteristics: Provide materials specified as determined by testing identical products per test method indicated below by a testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 1. Surface-Burning Characteristics: ASTM E 84
- E. Toxicity/Hazardous Materials
 1. Provide products that contain no urea-formaldehyde
 2. Products and equipment requiring or using CFCs, HCFCs, or HFCs during the manufacturing or application process will not be permitted
 3. Provide products that contain no PBDEs
 4. Provide products that are "Low-emitting"

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturers written instructions for handling and protection prior to and during installation.
- B. Store both components in a temperature controlled area between 50 deg F (15 deg C) and 100 deg F (32 deg C). Do not allow product to freeze.

C. Use only those components that are supplied by the Manufacturer.

1.7 PROJECT CONDITIONS

A. Do not expose to sunlight, except to extent necessary for period of installation and concealment.

1.8 WARRANTY

A. Manufacturer's standard limited lifetime warranty.

PART 2 - PRODUCTS

2.1 **OPEN CELL MANUFACTURERS** (Basis of Design)

A. Polyurethane Spray Foam Insulation: Equal to Icynene Classic™ (LD-C-50) by Icynene Inc.

B. Equal Product per Section 01 25 00.

2.2 MATERIALS

A. General: Provide insulating materials that comply with requirements and with referenced standards.

B. Icynene Classic™ (LD-C-50) Spray Foam Insulation: Low-density, water-blown, conforming to the following:

1. Thermal Resistance (R-Value/inch @75 deg F): ASTM C 518; 3.7 hr/sq ft/degree F/BTU
2. Air Permeance (for 3 inches of material): ASTM E 2178; < 0.014 L/s.m² @ 75 Pa
3. Water Vapor Transmission (for 5.5 inches of material): ASTM E 96; 11 perms [627 ng/(Pa.s.m²)]
4. Flame Spread and Smoke Developed Rating: ASTM E 84
 - a. Flame Spread: Less than 20
 - b. Smoke Development: Less than 400
5. Bacterial and Fungal Growth and Food Value: ASTM C 1338: no growth

C. Product Description:

1. ICC/ES Evaluation Report No. ESR 1826
2. Collaborative for High-Performance Schools (CHPS) "Low-emitting material" per CA 01350 Criteria

2.3 **CLOSED CELL MANUFACTURERS**

A. Polyurethane Spray Foam Insulation: Icynene ProSeal™ (MD-C-200v3) by Icynene Inc.

B. Intumescent paint: DC-315 by International Fireproof Technology Inc.

2.4 MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
- B. Icynene ProSeal™ (MD-C-200v3) Spray Foam Insulation: Medium-density, HFC 365/227 blown, conforming to the following:
 - C.
 - 1. Thermal Resistance (for 1 inch of material) (R-Value/inch @75 deg F): ASTM C 518; 7.1 hr.sq ft.degree F/BTU
 - 2. Air Permeance (for 1 inch of material): ASTM E 2178: less than 0.02 L/s.m² @75 Pa
 - 3. Water Vapor Transmission (for 1.5 inches of material): ASTM E 96; 0.97 perm
 - 4. Resistance to Fungal Growth: ASTM C 1338: no growth
 - 5. Product Emissions: Collaborative for High Performance Schools (CHPS) “Low-emitting” material per CA Section 01350 criteria.
 - 6. Flame Spread and Smoke Developed Rating: ASTM E 84
 - a. Flame Spread: 25
 - b. Smoke Development: 300
 - C. International Fireproof Technology Inc. DC-315: water-based, intumescent paint, conforming to the following:
 - 1. Full scale fire resistance test with Icynene ProSeal (MD-C-200v3) in accordance with NFPA 286: 24 wet mils (thermal barrier).
 - 2. Finish: flat, grey color
 - 3. VOC Content: 47 g/L
 - 4. Volume Solids: 67%
 - 5. Flash Point: none
 - 6. Mechanism of cure: coalescence
 - 7. Reducer/cleaner: water
 - 8. Collaborative for High Performance Schools (CHPS) “Low-emitting” material per CA Section 01350 criteria.
 - D. Product Description:
 - 1. Collaborative for High-Performance Schools (CHPS) “Low-emitting material” per CA Section 01350 Criteria

2.5 SOURCE QUALITY CONTROL

- A. Insulation product components produced in an ISO 9001 registered factory.

2.6 SOURCE QUALITY CONTROL

- A. Product produced in an ISO 9001 registered factory.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, under which work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.
 - 1. Review placement area to determine final location will not be within 3 inches of any heat source where the temperature will exceed 200 deg F per ASTM C 411 or in accordance with authorities having jurisdiction.

3.2 PREPARATION

- A. Clean substrates and cavities of loose materials capable of interfering with insulation placement.

3.3 APPLICATION

- A. Site mix liquid components manufactured by Icynene and supplied by Independent Icynene Licensed Dealer.
- B. Apply insulation to substrates in compliance with manufacturer's written instructions.
- C. Apply insulation to produce thickness required for indicated R Value.
- D. Extend insulation in thickness indicated to envelop entire area to be insulated.
- E. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

3.4 REPAIRS

- A. Any repairs must be effected by an Icynene Licensed Dealer.

3.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse.

END OF SECTION 07 21 19

SECTION 07 24 00 - EXTERIOR INSULATION FINISH SYSTEM

(Entrance Porch Soffit)

PART 1 – GENERAL

GENERAL CONDITIONS

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.01 SUMMARY

A. This Specification is based on Dryvit Systems Inc to establish the quality of work.

B. Related Sections

1. Concrete – Sections 03 30 00
2. Cold Formed Steel Framing – Section 05 40 00
3. Sealant – Section 07 92 00
4. Flashing – Section 07 62 00
5. Exterior gypsum sheathing – Section 06 16 43

1.02. REFERENCES

A. Section Includes

1. ASTM B 117 (Federal Test Standard 141A Method 6061) Standard Practice for Operating Salt Spray (Fog) Apparatus
2. ASTM C 150 Standard Specification for Portland Cement
3. ASTM C 297 Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
4. ASTM C 1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
5. ASTM C 1396 (formerly C 79) Standard Specification for Gypsum Board
6. ASTM D 968 (Federal Test Standard 141A Method 6191) Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
7. ASTM D 2247 (Federal Test Standard 141A Method 6201) Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
8. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
9. ASTM D 4060 Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
10. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials
11. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials
12. ASTM E 119 Standard Method for Fire Tests of Building Construction and Materials
13. ASTM E 330 Test Method for Structural Performance of Exterior Windows, Doors and Curtain Walls by Uniform Static Air Pressure Difference
14. ASTM E 331 Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference.
15. ASTM E 2098 Test Method for Determining the Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for use in Class PB Exterior Insulation and Finish Systems (EIFS), after Exposure to Sodium Hydroxide Solution
16. ASTM E 2134 Test Method for Evaluating the Tensile-Adhesion Performance of Exterior Insulation and Finish Systems (EIFS)
17. ASTM E 2430 Standard Specification for Expanded Polystyrene (EPS) Thermal Insulation Boards for use in Exterior Insulation and Finish System (EIFS)
18. ASTM E 2485 (formerly EIMA Std. 101.01) Standard Test Method for Freeze-Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water-Resistive Barrier Coatings
19. ASTM E 2486 (formerly EIMA Std. 101.86) Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS)
20. ASTM G 155 (Federal Test Standard 141A Method 6151) Standard Practice for Operating-Xenon Arc Light Apparatus, for Exposure of Nonmetallic Materials
21. DS107, Dryvit Outsulation System Installation Details
22. DS131, Dryvit Expanded Polystyrene Insulation Board Specification
23. DS135, Specification for Outsulation System with Mechanical Fasteners
24. DS151, Custom Brick™ Polymer System Specifications for Use on Vertical Walls
25. DS152, Dryvit Cleaning and Recoating
26. DS153, Dryvit Expansion Joints and Sealants
27. DS159, Dryvit Water Vapor Transmission

28. DS204, Dryvit Outsulation System Application Instructions
29. DS456, Rapidry DM™ 35-50 or DS457, Rapidry DM™ 50-75 Data Sheets
30. DS494, Dryvit AquaFlash™ System
31. Mil Std E5272 Environmental Testing
32. Mil Std 810B Environmental Test Methods
33. UBC Std 26-4 (Formerly UBC 17-6) Multi-Story Fire Evaluation of Exterior Non Load-Bearing Foam Plastic Insulated Wall Systems
34. NFPA 268 Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source.
35. NFPA 285 Standard Method of Test for the Evaluation of Flammability Characteristics of Exterior Non Load-Bearing Wall Assemblies Containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus
36. ULC S101 Standard Methods of Fire Endurance Tests of Building Construction Materials
37. ANSI FM 4880 Evaluating Insulated Wall or Wall and Roof/Ceiling Assemblies; Plastic Interior Finish Materials; Plastic Exterior Building Panels; Wall/Ceiling Coating Systems; Interior or Exterior Finish Systems

1.03 DEFINITIONS

- A. Base Coat: Material used to encapsulate one or more layers of reinforcing mesh fully embedded that is applied to the outside surface of the EPS.
- B. Building Expansion Joint: A joint through the entire building structure designed to accommodate structural movement.
- C. Contractor: The contractor that installs the Outsulation System to the substrate.
- D. Dryvit: Dryvit Systems, Inc., the manufacturer of the Outsulation System, a Rhode Island corporation.
- E. Expansion Joint: A structural discontinuity in the Outsulation System.
- F. Finish: An acrylic-based coating, available in a variety of textures and colors that is applied over the base coat.
- G. Insulation Board: Expanded polystyrene (EPS) insulation board, which is affixed to the substrate.
- H. Panel Erector: The contractor who installs the panelized Outsulation System.
- I. Panel Fabricator: The contractor who fabricates the panelized Outsulation System.
- J. Reinforcing Mesh: Glass fiber mesh(es) used to reinforce the base coat and to provide impact resistance.
- K. Sheathing: A substrate in sheet form.
- L. Substrate: The material to which the Outsulation System is affixed.
- M. Substrate System: The total wall assembly including the attached substrate to which the Outsulation System is affixed.
- N. High impact zones - areas indicated to receive base coat reinforced with painter mesh prior to standard mesh or standard plush mesh.

1.04 SYSTEM DESCRIPTION

- A. General: The Dryvit Outsulation System is an Exterior Insulation and Finish System, Class PB, consisting of an adhesive, expanded polystyrene insulation board, base coat, reinforcing mesh(es) and finish. Mechanically attached systems shall conform to Dryvit specification DS135.
- B. Methods of Installation
 1. Field Applied: The Outsulation System is applied to the substrate system in place.
 2. Panelized: The Outsulation System is shop-applied to the prefabricated wall panels.
- C. Design Requirements
 1. See Plans for substrate to be used. Substrate shall comply/be one of the following:
 - a. Exterior grade gypsum sheathing meeting ASTM C 1396 (formerly C 79) requirements for water-resistant core or Type X core at the time of application of the Outsulation System.
 - b. Exterior sheathing having a water-resistant core with fiberglass mat facers meeting ASTM C 1177.
 - c. Exterior fiber reinforced cement or calcium silicate boards.
 - d. APA Exterior or Exposure 1 Rated Plywood, Grade C-D or better, nominal 12.7 mm (1/2 in), minimum 4-ply.
 - e. APA Exposure 1 rated Oriented Strand Board (OSB), nominal 12.7 mm (1/2 in).
 - f. Galvanized expanded metal lath 1.4 or 1.8 kg/m² (2.5 or 3.4 lbs/yd²) installed over a solid substrate.
 2. Deflection of substrate systems shall not exceed 1/240 times the span.
 3. The substrate shall be flat within 6.4 mm (1/4 in) in a 1.2 m (4 ft) radius.
 4. The slope of inclined surfaces shall not be less than 6:12, and the length shall not exceed 305 mm (12 in).
 5. All areas requiring an impact resistance classification higher than "standard", as defined by ASTM E 2486 (formerly EIMA Std. 101.86), shall be as detailed in the drawings and described in the contract documents. Refer to Section 1.04.D.1.c of this specification.
 6. Expansion Joints
 - a. Design and location of expansion joints in the Outsulation System is the responsibility of the project

designer and shall be noted on the project drawings. As a minimum, expansion joints shall be placed at the following locations:

- 1) Where expansion joints occur in the substrate system.
- 2) Where building expansion joints occur.
- 3) At floor lines in wood frame construction.
- 4) At floor lines of non-wood framed buildings where significant movement is expected.
- 5) Where the Outsulation System abuts dissimilar materials.
- 6) Where the substrate type changes
- 7) Where prefabricated panels abut one another
- 8) In continuous elevations at intervals not exceeding 23 m (75 ft).
- 9) Where significant structural movement occurs such as changes in roofline, building shape or structural system.

7. Terminations

- a. Prior to applying the Dryvit Outsulation System, wall openings shall be treated with Dryvit AquaFlash System or Flashing Tape. Comply with Dryvit Outsulation System Installation Details, DS107.
 - b. The Outsulation System shall be held back from adjoining materials around openings and penetrations such as windows, doors and mechanical equipment a minimum of 19 mm (3/4 in) for sealant application. Comply with Dryvit's Outsulation System Installation Details, DS107.
 - c. The system shall be terminated a minimum of 203 mm (8 in) above finished grade.
 - d. Sealants
 - 1) Shall be manufactured and supplied by Section 07900.
 - 2) Shall be compatible with Outsulation System materials. Refer to current Dryvit Publication DS153 for listing of sealants tested by sealant manufacturer for compatibility.
 - 3) The sealant backer rod shall be of closed cell.
8. Vapor Retarders – See Plans for location and type. Comply with Dryvit Publication DS159 for additional information.
9. Flashing: Shall be provided at all roof-wall intersections, windows, doors, chimneys, decks, balconies and other areas as necessary to prevent water from entering behind the Outsulation System.

D. Performance Requirements

1. The Outsulation System shall have been tested as follows:
 - a. Durability

TEST	TEST METHOD	CRITERIA	RESULTS
Abrasion Resistance	ASTM D 968	No deleterious effects after 500 liters (528 quarts)	No deleterious effects after 1000 liters (1056 quarts)
Accelerated Weathering	ASTM G 155 Cycle 1	No deleterious effects after 2000 hours	No deleterious effects after 5000 hours
	ASTM G 154 Cycle 1 (QUV)		No deleterious effects after 5000 hours
Freeze-Thaw	ASTM E 2485 (formerly EIMA 101.01)	No deleterious effects after 60 cycles	Passed - No deleterious effects after 90 cycles
	ASTM C 67 modified	No deleterious effects after 60 cycles	Passed - No deleterious effects after 60 cycles
	ASTM E 2485/ICC-ES Proc.; ICC ES (AC219)***	No deleterious effects after 10 cycles	Passed - No deleterious effects after 10 cycles
Mildew Resistance	ASTM D 3273	No growth during 28 day exposure period	No growth during 60 day exposure period
Water Resistance	ASTM D 2247	No deleterious effects after 14 days exposure	No deleterious effects after 42 days exposure
Taber Abrasion	ASTM D 4060	N/A	Passed 1000 cycles
Salt Spray Resistance	ASTM B 117	No deleterious effects after 300 hours exposure	No deleterious effects after 1000 hours exposure
Water Penetration	ASTM E 331 ICC ES (AC 219)***	No water penetration beyond the inner-most plane of the wall after 2 hours at 299 Pa (6.24 psf)	Passed 2 hours at 299 Pa (6.24 psf)
Water Vapor Transmission	ASTM E 96 Procedure B	Vapor permeable	EPS 5 perm-inch Base Coat* 40 Perms Finish** 40 Perms

* Base Coat perm value based on Dryvit Genesis®

** Finish perm value based on Dryvit Quarzputz

*** AC 219 – Acceptance Criteria for EIFS

b. Structural

TEST	TEST METHOD	CRITERIA	RESULTS
Tensile Bond	ASTM C 297/E 2134	Minimum 104 kPa (15 psi) – substrate or insulation failure	Minimum 132 kPa (19.1 psi)
Transverse Wind Load	ASTM E 330	Withstand positive and negative wind loads as specified by the building code	Minimum 4.3 kPa (90 psf)* 16 inch o.c. framing, ½ in sheathing screw attached at 203 mm (8 inch) o.c.

* All Dryvit components remain intact – for higher wind loads contact Dryvit Systems, Inc.

c. Impact Resistance: In accordance with ASTM E 2486 (formerly EIMA Standard 101.86).

Reinforcing Mesh/Weight g/m ² (oz/yd ²)	Minimum Tensile Strengths	EIMA Impact Classification	EIMA Impact Range		Impact Test Results	
			Joules	(in-lbs)	Joules	(in-lbs)
Standard - 146 (4.3)	27 g/cm (150 lbs/in)	Standard	3-6	(25-49)	4	(36)
Standard Plus™ - 203 (6)	36 g/cm (200 lbs/in)	Medium	6-10	(50-89)	6	(56)
Intermediate® - 407 (12)	54 g/cm (300 lbs/in)	High	10-17	(90-150)	12	(108)
Panzer® 15 * - 509 (15)	71 g/cm (400 lbs/in)	Ultra High	>17	(>150)	18	(162)
Panzer 20 * - 695 (20.5)	98 g/cm (550 lbs/in)	Ultra High	>17	(>150)	40	(352)
Detail® Short Rolls - 146 (4.3)	27 g/cm (150 lbs/in)	n/a	n/a	n/a	n/a	n/a
Corner Mesh™ - 244 (7.2)	49 g/cm (274 lbs/in)	n/a	n/a	n/a	n/a	n/a

*Shall be used in conjunction with Standard Mesh (recommended for areas exposed to high traffic)

d. Fire performance

TEST	TEST METHOD	CRITERIA	RESULTS
Fire Resistance	ASTM E 119	No effect on the fire resistance of a rated wall assembly	Passed 1 hour Passed 2 hour
Ignitability	NFPA 268	No ignition at 12.5 kw/m ² at 20 minutes	Passed
Full Scale Multi-Story Fire Test	UBC Std. 26-4 (formerly 17-6)	1. Resist vertical spread of flame within the core of the panel from one story to the next 2. Resist flame propagation over the exterior surface 3. Resist spread of vertical flame over the interior surface from one story to the next 4. Resist significant lateral spread of flame from the compartment of fire origin to adjacent spaces	Passed
Intermediate Multi-Story Fire Test	NFPA 285 (UBC 26-9)	1. Resist flame propagation over the exterior surface 2. Resist vertical spread of flame within combustible core/component of panel from one story to the next 3. Resist vertical spread of flame over the interior surface from one story to the next 4. Resist lateral spread of flame from the compartment of fire origin to adjacent spaces	Passed
Full Scale Multi-Story* (corner test)	ANSI FM 4880	Resist flame propagation over the exterior surface.	Passed; No height restrictions*

* Dryvit FM products must be specified

2. The Outsulation components shall be tested for:
a. Fire

TEST	TEST METHOD	CRITERIA	RESULTS
Surface Burning Characteristics	ASTM E 84	All components shall have a: Flame Spread \leq 25 Smoke Developed \leq 450	Passed

- b. Durability

TEST	TEST METHOD	CRITERIA	RESULTS
Reinforcing Mesh Alkali Resistance of Reinforcing Mesh	ASTM E 2098 (formerly EIMA 105.01)	> 21dN/cm (120 pli) retained tensile strength after exposure	Passed
EPS (Physical Properties)	ASTM C 303, D 1622	15.2-20.0 kg/m ³ (0.95-1.25 lb/ft ³)	Pass
Density	ASTM C 177, C 518		Pass
Thermal Resistance	ASTM C 272	4.0 @ 4.4 °C (40 °F)	Pass
	ASTM D 2863	3.6 @ 23.9 °C (75 °F)	Pass
Water Absorption	ASTM D 1621 Proc. A	2.5 % max. by volume	Pass
Oxygen Index	ASTM C 203	24% min. by volume	Pass
Compressive Strength	ASTM C 203	69 kPa (10 psi) min.	Pass
Flexural Strength	ASTM E 84	172 kPa (25 psi) min.	Pass
Flame Spread		25 max.	Pass
Smoke Developed		450 max.	Pass

1.05 SUBMITTALS

- A. Product Data – The contractor shall submit to the Architect the manufacturer’s product data sheets describing products, which will be used on this project.
- B. Shop Drawing for Panelized Construction: The panel fabricator shall prepare and submit to the Architect complete drawings, showing: wall layout, connections, details, expansion joints and installation sequence.
- C. Samples: The contractor shall submit to the Architect two (2) samples of the Outsulation System for each finish, texture and color to be used on the project. The same tools and techniques proposed for the actual installation shall be used. Samples shall be of sufficient size to accurately represent each color and texture being utilized on the project.
- D. Test Reports – When requested, the contractor shall submit to the Architect copies of selected test reports verifying the performance of the Outsulation System.

1.06 QUALITY ASSURANCE

A. Qualifications

1. System Manufacturer: Shall be Dryvit Systems, Inc. All materials shall be manufactured or sold by Dryvit and shall be purchased from Dryvit or its authorized distributors.
 - a. Materials shall be manufactured at a facility covered by a current ISO 9001:2000 certification. Certification of the facility shall be done by a registrar accredited by the American National Standards Institute, Registrar Accreditation Board (ANSI-RAB).
2. Contractor: Shall be knowledgeable in the proper installation of the Dryvit Outsulation System and shall be experienced and competent in the installation of Exterior Insulation and Finish Systems. Additionally, the contractor shall possess a current Outsulation System Trained Contractor Certificate* issued by Dryvit Systems, Inc.
3. Insulation Board Manufacturer: Shall be listed by Dryvit Systems, Inc., shall be capable of producing the Expanded Polystyrene (EPS) in accordance with current Dryvit Specification for Insulation Board, DS131, and shall subscribe to the Dryvit Third Party Certification and Quality Assurance Program.
4. Panel Fabricator: Shall be a contractor experienced and competent in the fabrication of architectural wall panels and shall possess a current Outsulation System Contractor Certificate* issued by Dryvit Systems, Inc.
5. Panel Erector: Shall be experienced and competent in the installation of architectural wall panel systems and shall be:
 - a. The panel fabricator, or
 - b. An erector approved by the panel fabricator or
 - c. An erector under the direct supervision of the panel fabricator

B. Regulatory Requirements

1. The EPS shall be separated from the interior of the building by a minimum 15-minute thermal barrier.
2. The use and maximum thickness of EPS shall be in accordance with the applicable building codes.

C. Certification

1. The Outsulation System shall be recognized for the intended use by the applicable building code(s).

D. Mock-Up

1. The contractor shall, before the project commences, provide the Architect with a mock-up for approval.
2. The mock-up shall be of suitable size as required to accurately represent the products being installed, as well as each color and texture to be utilized on the project.
3. The mock-up shall be prepared with the same products, tools, equipment and techniques required for the actual application. The finish used shall be from the same batch that is being used on the project.
4. The approved mock-up shall be available and maintained at the job site.
5. For panelized construction, the mock-up shall be available and maintained at the panel fabrication location.

1.07 DELIVERY, STORAGE AND HANDLING

A. All Dryvit materials shall be delivered to the job site in the original, unopened packages with labels intact.

B. Upon arrival, materials shall be inspected for physical damage, freezing, or overheating. Questionable materials shall not be used.

1. Materials shall be stored at the jobsite in a cool, dry location, out of direct sunlight, protected from weather and other sources of damage. Minimum storage temperature shall be as follows:
 - a. Demandit®, Revyvut®: 7 °C (45 °F)
 - b. Ameristone™, TerraNeo® and **Limestone™**: 10 °C (50 °F)
 - c. DPR, PMR™ and **E™** Finishes, Color Prime™, Primus®, Genesis and NCB™: 4 °C (40 °F)
 - d. Custom Brick™ finish: Refer to Custom Brick Polymer Specification, DS151.
 - e. For other products, refer to specific product data sheets.
2. Maximum storage temperature shall not exceed 38° C (100 °F).

NOTE: Minimize exposure of materials to temperatures over 32 °C (90 °F). Finishes exposed to temperatures over 43 °C (110 °F) for even short periods may exhibit skinning, increased viscosity and should be inspected prior to use.

C. Protect all products from inclement weather and direct sunlight.

1.08 PROJECT CONDITIONS**A. Environmental Requirements**

1. Application of wet materials shall not take place during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are completely dry.
2. At the time of application, the minimum air and wall surface temperatures shall be as follows:
 - a. Demandit, Revyvut: 7 °C (45 °F)
 - b. Ameristone, TerraNeo and Limestone: 10 °C (50 °F)
 - c. DPR, PMR and **E** Finishes, Color Prime, Primus, Genesis and NCB: 4 °C (40 °F)
 - d. Custom Brick Finish: refer to Custom Brick Polymer Specification, DS151.
 - e. For other products, refer to specific product data sheets.
3. These temperatures shall be maintained with adequate air ventilation and circulation for a minimum of 24 hours (48 hours for Ameristone, TerraNeo and Limestone) thereafter, or until the products are completely dry. Refer to published product data sheets for more specific information.

B. Existing Conditions - The contractor shall have access to electric power, clean water, and a clean work area at the location where the Dryvit materials are to be applied.

1.09 SEQUENCING AND SCHEDULING

A. Installation of the Outsulation System shall be coordinated with other construction trades.

B. Sufficient manpower and equipment shall be employed to ensure a continuous operation, free of cold joints, scaffold lines, texture variations, etc.

1.10 LIMITED MATERIALS WARRANTY

A. Dryvit Systems, Inc. shall provide a limited 5-Year (five) warranty against defective material.

B. The applicator shall warrant workmanship for five years against leaks and defects.

1.11 MAINTENANCE

A. Maintenance and repair shall follow the procedures noted in Dryvit Outsulation Application Instructions, DS204.

B. All Dryvit products are designed to minimize maintenance. However, as with all building products, depending on location, some cleaning may be required. See Dryvit publication DS152 on Cleaning & Recoating.

C. Sealants and Flashings should be inspected on a regular basis and repairs made as necessary.

PART 2 – PRODUCTS

2.01 MANUFACTURER

A. All components of the Outsulation System shall be supplied or obtained from Dryvit or its authorized distributors. Substitutions or additions of materials other than specified will void the warranty. Equal product by STO Corporation 1-800-221-2397 or Parex 1-800-537-3729.

2.02 MATERIALS

A. Portland Cement: Shall be Type I or II, meeting ASTM C 150, white or gray in color, fresh and free of lumps.
 B. Water: Shall be clean and free of foreign matter.
 C. Mechanical Fasteners (required when installing in accordance with DS135): Shall be Wind-lock's Wind Devil™ plates, or equivalent, used in conjunction with corrosion resistant fasteners appropriate for the substrate system.

2.03 COMPONENTS

A. Sto Gold Coat Liquid Applied Barrier over sheathing.
 B. Flashing Materials: Used to protect substrate edges at terminations.
 1. Liquid Applied: An extremely flexible water-based polymer material, ready for use.
 a. Shall be AquaFlash and AquaFlash Mesh
 2. Sheet Type:
 a. Shall be Flashing Tape and Surface Conditioner
 1) Dryvit Flashing Tape™: A high density polyethylene film backed with a rubberized asphalt adhesive available in rolls 102 mm (4 in), 152 mm (6 in) and 229 mm (9 in) wide by 23 m (75 ft) long.
 2) Dryvit Flashing Tape Surface Conditioner™: A water-based surface conditioner and adhesion promoter for the Dryvit Flashing Tape.
 C. Adhesives: Used to adhere the EPS to the substrate, shall be compatible with the substrate and the EPS.
 1. Cementitious: A liquid polymer-based material, which is field mixed with Portland cement for use over non wood-based substrates.
 a. Shall be Primus®, Genesis® or Genesis FM
 2. Ready mixed: A dry blend cementitious, copolymer-based product, field mixed with water for use over non wood-based substrates.
 a. Shall be Primus® DM, Genesis® DM, Genesis® DMS, Rapidry DM 35-50 or Rapidry DM 50-75.
 3. Noncementitious: A factory-mixed, fully formulated water-based adhesive for use over wood-based substrates.
 a. Shall be ADEPS®.
 D. Insulation Board: Expanded polystyrene meeting Dryvit Specification for Insulation Board, DS131.
 1. Thickness of insulation board shall be minimum 1 inch and shall be maintained at all locations. **Note: A minimum of 25 mm (1 in) thick insulation board shall be installed to maintain the minimum thickness after rasping, reveals are installed, etc.**
 2. The insulation board shall be manufactured by a board supplier listed by Dryvit Systems, Inc.
 E. Base Coat: Shall be compatible with the EPS insulation board and reinforcing mesh(es).
 1. Cementitious: A liquid polymer-based material, which is field mixed with Portland cement.
 a. Shall be Primus, Genesis or Genesis FM.
 2. Noncementitious: A factory-mixed, fully formulated, water-based product.
 a. Shall be NCB™.
 3. Ready mixed: A dry blend cementitious, copolymer-based product, field mixed with water.
 a. Shall be Primus DM, Genesis DM, Genesis DMS, Rapidry DM 35-50 or Rapidry DM 50-75.
 F. Reinforcing Mesh: A balanced open weave, glass fiber fabric treated for compatibility with other system materials.
 1. Shall be Intermediate 407(12) Reinforcing Mesh, 300 lbs in tensile strength, high impact classification, 10-17 joules impact range.
 G. Finish: Shall be the type, color and texture as selected by the architect/owner and shall be the following: (smooth fine texture)

PART 3 – EXECUTION

3.01 EXAMINATION

A. Prior to installation of the Outsulation System, the contractor shall verify that the substrate:

1. Is of a type listed in Section 1.04.C.1.
 2. Is flat within 6.4 mm (1/4 in) in a 1.2 m (4 ft) radius.
 3. Is sound, dry, connections are tight, has no surface voids, projections or other conditions that may interfere with the Outsulation System installation or performance.
- B. Prior to the installation of the Outsulation System, the General Contractor shall insure that all needed flashings and other waterproofing details have been completed, if such completion is required prior to the Outsulation application. Additionally, the Contractor shall ensure that:
1. Metal roof flashing has been installed in accordance with Asphalt Roofing Manufacturers Association (ARMA) Standards or the National Roofing Contractor's Association (NRCA).
 2. Openings are flashed in accordance with the Outsulation System Installation Details, DS107, or as otherwise necessary to prevent water penetration.
 3. Chimneys, Balconies, and Decks have been properly flashed.
 4. Windows, Doors, etc. are installed and flashed per manufacturer's requirements and the Outsulation System Installation Details, DS107.
- C. Prior to the installation of the Outsulation System, the contractor shall notify the General Contractor, and/or Architect of all discrepancies or deviations from Plans and Specifications which might jeopardize the required warranty.

3.02 PREPARATION

- A. The Outsulation materials shall be protected by permanent or temporary means from inclement weather and other sources of damage prior to, during, and following application until completely dry.
- B. Protect adjoining work and property during Outsulation installation
- C. The substrate shall be prepared as to be free of foreign materials, such as, oil, dust, dirt, form release agents, efflorescence, paint, wax, water repellants, moisture, frost and any other condition that inhibit adhesion.

3.03 INSTALLATION

- A. The system shall be installed in accordance with the current Dryvit Outsulation System Application Instructions, DS204.
- B. The overall minimum base coat thickness shall be sufficient to fully embed the mesh. The recommended method is to apply the base coat in two (2) passes.
- C. Sealant shall not be applied directly to textured finishes or base coat surfaces. Dryvit Outsulation System base coat surfaces in contact with sealant shall be coated with Demandit or Color Prime.
- D. When installing the Outsulation System, the notched trowel method of adhesive application shall be used over gypsum sheathing substrates.
- E. High impact meshes shall be installed as specified at ground level, high traffic areas and other areas exposed to or susceptible to impact damage.

3.04 FIELD QUALITY CONTROL

- A. The contractor shall be responsible for the proper application of the Outsulation materials.
- B. Dryvit assumes no responsibility for on-site inspections or application of its products.
- C. If required, the contractor shall certify in writing the quality of work performed relative to the substrate system, details, installation procedures, workmanship and as to the specific products used.
- D. If required, the EPS supplier shall certify in writing that the EPS meets Dryvit's specifications.
- E. If required, the sealant contractor shall certify in writing that the sealant application is in accordance with the sealant manufacturer's and Dryvit's recommendations.

3.05 CLEANING

- A. All excess Outsulation System materials shall be removed from the job site by the contractor in accordance with contract provisions and as required by applicable law.
- B. All surrounding areas, where the Outsulation System has been installed, shall be left free of debris and foreign substances resulting from the contractor's work.

3.06 PROTECTION

- A. The Outsulation System shall be protected from inclement weather and other sources of damage until dry and permanent protection in the form of flashings, sealants, etc. are installed.

3.07 WARRANTY

- A. The EIFS Contractor shall provide a 5-Year (Five) written warranty against leaks and defects including labor for repair/replacement of materials.
- B. The EIFS manufacturer shall provide a 5-Year (Five) written warranty against material defects.

END

SECTION 07 46 33 - COMPOSITE WALL AND SOFFIT

PANELS PART 1 GENERAL

1.01 SECTION INCLUDES

- A' Composite wall and soffit plank panel system'

1.02 RELATED REQUIREMENTS

- A' Section 05 40 00 - Cold-Formed Metal Framing: Siding substrate'
- B' Section 07 21 00 - Thermal Insulation: Insulation board applied over exterior stud wall before siding installation'
- C' Section 07 27 26 - Fluid-Applied Non-Permeable Air-Barrier' Water and vapor resistive barrier under composite plank system'
- D' Section 07 92 00 - Joint Sealants: Sealing joints between siding and adjacent construction and fixtures'

1.03 REFERENCE STANDARDS

- A' ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2014'
- B' ASTM D3679 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding; 2013'
- C' ASTM D4477 - Standard Specification for Rigid (Unplasticized) Poly(Vinyl Chloride) (PVC) Soffit; 2016'
- D' ASTM D5206 - Standard Test Method for Windload Resistance of Rigid Plastic Siding; 2013'

1.04 SUBMITTALS

- A' See Section 01 30 00 - Submittal Procedures
- B' Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1' Preparation instructions and recommendations'
 - 2' Storage and handling requirements and recommendations'
 - 3' Installation methods'
- C' Samples: Provide samples in colors specified, not less than 12 inches in length'
- D' Color Charts: Where colors are not specified, provide samples of manufacturer's entire color line for selection'

1.05 QUALITY ASSURANCE

- A' Installer Qualifications: Not less than three years of experience with products specified'

1.06 DELIVERY, STORAGE, AND HANDLING

- A' Store products in manufacturer's unopened packaging until ready for installation'
- B' Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction'

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A' Basis of Design Product: Subject to compliance with requirements, provide the products listed below as the "Basis of Design" Specific composite materials are identified in the drawings to establish color, design intent, and required standard of quality' It is not the intent to preclude the use of other prior approved, acceptable manufacturers'
 - 1' **Basis of Design:** Azek Building Products - XLM Collection; www.azek.com
 - 2' Fiberon - Horizon Decking; www.fiberondecking.com
 - 3' TimberTech - Earthwood Evolutions Legacy; www.timbertech.com
 - 4' Or prior approved equal'

2.02 MATERIALS

A' General Requirements:

- 1' Siding: Comply with ASTM D3679'
- 2' Soffit: Comply with ASTM D4477'
- 3' Wind Resistance: Capable of withstanding minimum of 30 psf negative pressure, when tested in accordance with ASTM D5206'
- 4' Horizontal Flammability, when tested in accordance with ASTM D635:
 - a' Burn Distance: 0'79 inch, maximum'
 - b' Burn Time: Less than five seconds'

B' Plank Soffit and Wall Panels :

- 1' Profile: Grooved Plank Decking'
- 2' Thickness: 0'038 inch, minimum'
- 3' Width: 5'360 inch, minimum
- 4' Length: 20 feet, minimum, where available'
- 5' Fastening System: Concealed fasteners as recommended by plank manufacturer'
- 6' Finish: Smooth'
- 7' Color: As selected from manufacturer's full range of available colors'

- C. Fasteners – Hillman Deck Plus 10 x 2 ½” screws to reduce fiber mushrooming, color to match siding. 2 per every 16”, set flush with surface, predrill into metal studs where necessary.

PART 3 EXECUTION

3.01 EXAMINATION

- A' Examine substrate conditions before beginning installation; verify dimensions and acceptability of substrate'
- B' Do not proceed with installation until unacceptable conditions have been corrected'
- C' If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding'

3.02 INSTALLATION

- A' Install siding, soffit, and trim in accordance with manufacturer's printed installation instructions and VS I (INST)'
- B' Attach securely to framing, not sheathing, with horizontal components true to level and vertical components true to plumb, providing a weather resistant installation'
- C' Install joint sealers between siding/soffit/trim and adjacent construction, using procedures specified in Section 07 9200'
- D' Clean dirt from surface of installed products, using mild soap and water'

3.03 PROTECTION

- A' Protect installed products until completion of project'
- B' Touch-up, repair or replace damaged products before Date of Substantial Completion

SECTION 07 52 00 – SA ROOFING SYSTEM
REPAIR & NEW at ELEVATOR PENTHOUSE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

- B. Related Work Specified Elsewhere:
 - 1. Section 06 10 00 "Rough Carpentry" for wood & fasteners provided.
 - 2. Section 07 62 00 "Sheet Metal Flashing & Trim"

1.2 SUMMARY

- A. Scope of roofing work is shown on drawings and required by the specifications including the following:
 - 1. Removal and replacement of existing roofing materials at NE Corner of building
 - 2. New Roofing for Elevator Penthouse
 - 3. Clean & apply torch down product at new rooftop HVAC unit curbs.
 - 4. Other roofing-related items specified or indicated on the drawings or otherwise necessary.
 - 5. 10 Year Manuf. Warranty for the New Roof at Penthouse & 1 Year Manuf. Warranty for the Repairs
 - 6. 2 Year Contractor Material & Labor Warranty for the New Work & Repairs

1.3 REFERENCES

- A. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual
- B. Underwriters Laboratories (UL) - Fire Hazard Classification
- C. Factory Mutual Research Corporation (FM) – Approval Guide
- D. Sheet Metal Air Conditioning Contractors National Association, Inc. (SMACNA) - "Architectural Sheet Metal Manual"
- E. NRCA (National Roofing Contractors Association) - Roofing and Waterproofing Manual, current edition.

1.4 SYSTEM DESCRIPTION

- A. SBS Self-Adhering Roofing System: Three ply self adhered membrane system, roof insulation and base sheet on new Penthouse and single ply SA membrane sys. at existing zonolight/metal deck at area to be repaired. Torch Down or self adhesive membrane at new Equipment curbs. Provide all materials and workmanship as required for Warranty regardless if not indicated in the plans/specs.

- B. Detailed drawings and dimensions contained in these specifications shall be assumed to be approximate. Contractor is advised to site verify the existing project conditions and dimensions prior to bid and notify the Architect Bill@LAND3.com prior to Bids if work requirements at the jobsite disclose a discrepancy with the dimensions or this specification.

1.6 DESIGN CRITERIA

- A. General: Installed roofing membrane system shall remain watertight; and resist wind uplift pressures as required by codes without failure.
- B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Installer must comply with current code requirements based on authority having jurisdiction.

1.7 QUALIFICATIONS

- A. All work performed by the contractor shall be done by competent, highly skilled workmen equipped with equipment and tools necessary to perform all construction in accordance with this specification and detail drawings. Any and all substandard work shall be rejected.
- B. Roofing Contractor shall provide a current letter stating that he is certified issued by the roofing system manufacturer for the system specified. Submit to Architect electronically as part of the roofing submittals prior to ordering roofing materials.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's guarantee.
- B. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site with seals and manufacturer's product labels intact.
- B. Deliver materials in Manufacturers original containers, dry and undamaged.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.11 BIDDING REQUIREMENTS

- A. Contractor shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com

1.12 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply roofing membrane during inclement weather.
- B. Do not apply roofing membrane to damp or frozen deck surface or when temperature is predicted to be 32 Deg. F or below within 24 hours of installation.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- D. Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.
- E. The entire roof system shall be installed in a manner so that no insulation board is exposed to rain or moisture. Install the insulation with overnight tie-ins to ensure this protection.

1.13 GUARANTEE REQUIREMENTS:

- A. Roofing Contractor 2 Year Guarantee for Labor & Materials.
- B. Manufacturer Guarantee 10 Years at Repair

1.14 SUBMITTALS (Comply with Section 01 33 00)

- A. Product Data: For each type of product indicated submit product literature & installation instructions. Include all fasteners with pullout strength. All submittals shall be submitted at the same time.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work. Include base flashings, cants, and membrane terminations.
- C. Samples for Verification: For each product used. Samples shall be construed as examples of finished color and texture.

1.15 MATERIAL, DELIVERY, STORAGE AND HANDLING

- A. Unload and handle all roofing and construction materials with care
- B. Examine all materials as they are received. Do not use any materials that are damaged, unlabeled or otherwise unfit for use. Materials must display legible labels, which identify the materials and applicable reference standards.
- C. Immediately notify carrier and manufacturer of damaged, wet or defective materials.
- D. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.
- E. At the job site, no more material should be stored that will be used within two weeks. For periods longer than two weeks, the materials should be properly warehoused, i.e., dry, ventilated, on pallets, etc. No more material should be stored on the roof than can be used within five days. When prolonged inclement weather threatens, i.e., rainy seasons, no more roofing materials should be supplied to the rooftop than can be used within two days.
- F. Store roll goods on end on pallets in a clean, dry, well ventilated protected area. Take care to prevent damage to roll ends or edges. Do not double stack modified bitumen products.
- G. Remove manufacturer supplied plastic covers from materials provided with such covers. Use "breathable" type covers such as canvas tarpaulins to allow venting and protection from weather and moisture. Cover and protect materials at the end of each day work. Do not remove any protective tarpaulins until immediately before material will be installed.

PART 2 - PRODUCTS

2.1 MEMBRANE ROOF SYSTEM: Metal Deck at Elevator Penthouse (10 Year Weathertight Warranty)

The roofing system shall be based on the following three (3) Ply SBS Modified Bituminous (Self-Adhered) Membrane Roofing system equal to:
Certaineed Roofing Products Company (SPEC. #SA-C-B3):
Cap Sheet: Flintlastic SA FR Cap
Interply: Flintlastic SA FR Mid Ply
Screw Base thru metal deck: Flintlastic SA
Flashing: Flintlastic SA FR Cap

TORCHDOWN MEMBRANE: Equal to Certaineed Flintlastic STA

Equal products by GAF, Johns Manville, Firestone or Carlisle.

Note: Adjust products/systems as needed to achieve Warranties as stated. 2 Ply System is acceptable if this achieves stated warranties.

2.2 LIQUID APPLIED FLASHING: A liquid and fabric reinforced flashing system created with a stitch bonded polyester scrim and a two-component, moisture cured, elastomeric, liquid applied flashing material, consisting of an asphalt extended urethane base material and an activator per above manufacturer's proprietary product included in the 20 year NDL material and labor warranty.

2.3 MEMBRANE MATERIAL

- A. Membrane: Asphalt and polymer modifiers of styrene-butadiene-styrene (SBS) type, reinforced with non-woven fiber glass; granule surfaced.

2.4 AUXILIARY ROOFING MATERIALS

- A. Asphalt Primer: ASTM D41.
- B. Asphalt Roofing Cement: ASTM D 4586, type I, asbestos free, of consistency required by roofing system manufacturer for application.
- C. Cold-Applied Adhesive: ASTM D3019, Type III, Grade 2. asphalt-based, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with membrane applications.

- D. Cold-Applied Flashing Adhesive: Roofing system manufacturer's asphalt-based, two-component, asbestos-free, trowel-grade, cold-applied adhesive specially formulated for compatibility and use with flashing applications.
- E. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors.
- F. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.5 INSULATION (Factory Mutual Approved Insulation System)

- A. Insulation Material
 - 1. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C 1289 Type I Class 1, with the following additional characteristics:
 - a. Thickness: Minimum – 1 ½"
 - b. Size: 48 inches by 96 inches, nominal for mechanically attached on Building 3 and 48 inches by 48 inches, nominal for mechanically attached on Building 9.
 - c. R-Value (LTTR):
 - 1) 5.7 inch minimum
 - d. Compressive Strength: 20 psi (138 kPa) when tested in accordance with ASTM C 1289.
 - e. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.
 - f. Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.
- B. Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate

2.6 FASTENERS

- A. Mechanical Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer
 - 1. Fasteners: Type and size as required by roof membrane manufacturer for roofing system and wind load for roof.
- B. Metal Deck
 - 1. Metal fasteners & increased securement at perimeter & corners.

2.7 ACCESSORIES

- A. Sealant: One-component urethane, non sag, compatible with membrane and flashing materials.
 - 1. Flexible Seal; AC Products, Inc.
 - 2. Tremseal; Tremco.
 - 3. Sonolastic NP 1; Sonneborne.
 - 4. Black Jack No.1010; Gibson-Homans.
 - 5. PS 304 by Siplast
- B. Nailers and Blocking: Non treated provided under Section 06 10 00 Rough Carpentry.
- C. Cant Strip:
 - 1. Wood Blocking, preformed to 45 degree angle.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secured.

1. Verify deck is clean and smooth, free of depressions, waves, or projections.
 2. Verify deck surfaces are dry and free of water, snow, and ice.
- C. For location and extent of existing deck types see the drawings.
- D. Examine roof deck to determine that it is sufficiently rigid, dry and free of moisture per manufacturer's requirements using approved methods.
- E. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
- F. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
- G. Unacceptable conditions must be corrected prior to roof installation.
- H. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.

3.2 PREPARATION-REROOFING

- A. Remove all roofing membrane, coverboards, insulation, fasteners, asphalt, pitch, adhesives, base flashings, counterflashings, pitch pans, pipe flashings, vent and like components necessary for application of new membrane etc.
- B. Remove an area no larger than can be re-roofed in one day.
- C. Remove trash, debris, grease, oil, water, and contaminants from roof deck surface.
- D. Cover roof drains and other items to avoid roofing materials falling into openings.
- E. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.
- F. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that may damage the membrane.
- G. Fill all surface voids in the immediate substrate that are greater than 1/4 inch (6 mm) wide with fill material acceptable insulation to membrane manufacturer.
- H. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.
- I. Where torch down is indicated, clean & pressure wash existing roofing and allow to dry prior to membrane application.

3.3 MEMBRANE ROOF INSTALLATION

- A. Install membranes and rigid insulation in configuration required by the manufacturer. Stagger the insulation board joints from top layer to bottom layer.
- B. Neatly and tightly fit to all penetrations, projections, and nailers, with gaps not greater than 1/8 inch. Fill gaps greater than 1/8 inch with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch.
- C. Secure rigid insulation to deck with mechanical fasteners.
- D. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
- E. Lay roof insulation in courses parallel to roof edges.
- F. Loose Laid Installation: Install insulation by laying loose over substrate without mechanical securement of any kind.
- G. Mechanical Fastening: Using specified fasteners and insulation plates engage fasteners through insulation into deck to depth and in pattern required by Factory Mutual for FM Class specified and membrane manufacturer, whichever is more stringent.
- H. **Membrane Application for Wood Deck**
1. Apply membrane in accordance with manufacturer's instructions.
 2. Apply membrane; lap and seal edges and ends permanently waterproof.
 3. Apply membrane smooth, free from air pockets, wrinkles, or tears. Ensure full bond of membrane to substrate.
 4. Install wood fiber board using cold adhesive.

5. **Install a smooth base-ply membrane using membrane adhesive.**

- I. Flashings
 - 1. Flexible Flashings:
 - a. Apply flexible sheet base flashings to seal membrane to vertical elements.
 - 2. Counter Flashing and Flashing:
 - a. Fasten edge of membrane at terminations to receive base flashings in accordance with manufacturer's recommendations.
 - b. Flanged metal flashings shall be primed and set in mastic over the first SBS layer and waterproofed using a minimum of two (2) additional layers of SBS membrane.
 - c. Provide foil-clad modified bituminous flashings. Apply using methods as recommended by roofing manufacturer.
- J. Fascias: Install as recommended by modified bituminous sheet roofing manufacturer. Extend flashing terminations and curbs to height indicated, but to not less than 4 inches above top of cant or to top of curb not less than 8 inches high.
 - 1. The metal flanges shall be completely primed and allowed to dry 24 hours prior to installation.
 - 2. The modified bitumen base ply shall be extend over the roof edge nailer and down face covering bottom joint.
 - 3. After the base ply and continuous cleat have been installed, the flange shall be set in mastic and stagger nailed every three (3) inches on center.
 - 4. The flange shall be stripped in using nine (9) inch wide strips of the base ply material.
 - 5. The modified bitumen cap sheet shall then be applied, terminating at the gravel stop rise of the edge Metal.
- K. Accessories
 - 1. Sealant
 - a. Caulk all exposed finish ply edges at gravel stops, waste and vent stacks, and other roof penetrations indicated on Drawings, with a smooth continuous bead of approved sealant.
 - 2. Liquid Membrane Flashing System.

3.4 INSTALLATION SEQUENCE OF MEMBRANE ROOF SYSTEM

- A. Install **two** modified bituminous roofing [membrane sheets base sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, with the following installation method:
 - 1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
 - 2. Install one lapped **base sheet course** and use cold applied adhesive to substrate according to roofing system manufacturer's written instructions.
 - a. Side and end laps must be installed using heat welding techniques.
 - 3. Adhere **modified bituminous roofing membrane cap sheet** to substrate in cold-applied adhesive according to roofing system manufacturer's instruction.
- B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - 1. Repair tears and voids in laps and lapped seams not completely sealed.
 - 2. Apply roofing granules to cover exuded bead at laps while bead is hot.
- C. Install roofing membrane sheets so side and end laps shed water.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

35 CLEANING

- A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
- B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
- C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

D. Repair or replace defaced or disfigured finishes caused by work of this section.

3.6 PROTECTION

A. Protect building surfaces against damage from roofing work.

B. Where traffic must continue over finished roof membrane, protect surfaces.

END OF SECTION

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes sheet metal flashing and trim in the following categories:
 - 1. Misc. Sheet metal flashing where shown on drawings.
 - 2. Around exterior wall & roof penetrations.
 - 3. Roof Valleys, Roof to Wall intersections.
 - 4. Transitions between wall cladding materials or construction types.
 - 5. Gutters & Downspouts where shown new on plans.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 3 Section "Cast-in-Place Concrete" for installing reglets.
 - 2. Division 6 Section "Rough Carpentry" for wood nailers, curbs, and blocking not part of sheet metal flashing and trim.
 - 3. Division 7 Section "Waterproofing & Wall Flashing".
 - 4. Division 7 Section "Joint Sealants" for field-applied sheet metal flashing and trim sealants.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Install watertight sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, waffling and fastener loosening.
- B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from 120 degree F to 180 degree F temperature change in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements.
- C. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building envelope or interior.

1.4 SUBMITTALS

- A. Product Data including manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.
- B. Shop Drawings of each item specified showing layout, profiles, methods of joining, elevations, dimensions, anchorage details and fasteners.
- C. Samples of sheet metal flashing, trim, and accessory items, in the specified finish. Where finish involves normal color and texture variations, include samples showing the full range of variations expected.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.6 PROJECT CONDITIONS

- A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

1.7 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids. Should the sub-contractor have questions or need clarifications, he shall notify the architect/architect at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.1 METALS

- A. Pre-painted hot dipped galvanized steel (G-90), commercial quality with 70% Kynar finish coating. Shall be Fluoropolymer 2 coat thermocured system composed of specially formulated inhibitive primer and Fluoropolymer color topcoat containing not less that 70% polyvinylidene fluoride resin by weight; complying with AAMA 605.2. Color and gloss selected by Architect.

2.2 MANUFACTURERS

- A. Basis of Design - ColorKlad by Integris Metals - Royal Blue Band. Other colors as selected by Architect from full range of colors.
- B. Equal by McElroy Metal Inc.
- C. Equal by Copper Sales Inc.
- D. Approved equal

2.3 SEAMLESS ALUMINUM GUTTER & DOWNSPOUT MANUFACTURERS

- A. First American
- B. Reynolds
- C. United Aluminum
- D. Equal by Section 01 25 00

2.4 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Elastomeric Sealant: Generic type recommend by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 "Joint Sealants."
- B. Adhesives: Type recommended by flashing sheet metal manufacture for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal Accessories.
- C. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work, matching or compatible with material being installed; non-corrosive; size and thickness required for performance.

2.5 FABRICATION, GENERAL

- A. Seams: Fabricate nonmoving seams in aluminum with flat-lock, or standing seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
- B. Expansion Provisions: Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in Work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25mm) deep, filled with mastic sealant (concealed within joints).
- C. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
- D. Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.
- E. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.
- F. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, non-corrosive metal recommended by sheet metal manufacturer. The size shall be as recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.6 SHEET METAL FABRICATIONS

- A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.
- B. Roof flashing and related flashing shall be fabricated in maximum lengths to minimized joints plates.
- C. Include all metal flashing indicated on exterior of building: flashing, counter flashing, drip edges, etc.
- D. Seamless Gutters -corrosion resistant, white pre-finished continuous seamless aluminum coil residential style, sized for 100 year rain. Min. 4 downspouts per house. Finished side coated with a durable, baked linear polyester finish, meeting the specifications set forth by the American Architectural Manufacturers Assoc. Color matched, pre-formed downspouts, elbows, miters and other accessories manuf. from same coil material. Hangers are mill finish secured at spacing required for site Wind Loads indicated on Plan Title Sheet.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- B. Roof-Edge Flashings: Secure metal flashings at roof edges according to FM Loss Prevention Data Sheet 1-49 for specified wind zone.
- C. Expansion Provisions: Provide for thermal expansion of exposed sheet metal Work. Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection.
- D. Separations: Separate metal from non-compatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.
 - 1. Underlayment: Where installing stainless steel or aluminum directly on cementitious or wood substrates, install a slip sheet of red-rosin paper and a course of polyethylene underlayment.
 - 2. Bed flanges of Work in a thick coat of roofing cement where required for waterproof performance. Prime metal a minimum 24 hours prior to installation.
- E. Counter flashings: Coordinate installation of counter flashings with installation of assemblies to be protected by counterflashing. Install counter flashings in reglets or receivers. Secure in a waterproof manner by means of snap-in installation and sealant. Lap counterflashing joints a minimum of 2 inches (50 mm) and bed with sealant.
- F. Equipment Support Flashing: Coordinate equipment support flashing installation with roofing and equipment installation. Weld or seal flashing to equipment support member.

3.3 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.
- B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION

SECTION 07 84 00 – FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

- B. Related Sections include the following:
 - 1. Section 03 30 00 "Cast-In-Place Concrete"
 - 2. Section 07 92 00 "Joint Sealants"
 - 3. Section 09 21 16 "Gypsum Board"
 - 4. Divisions 22, 23 & 26.

1.2 SCOPE

- A. Contractor shall review all drawings for conditions that warrant Fire stopping and include such Work in his bid. The Design Intent is to include all items required for the completion of work. The drawings indicate examples of the types of conditions and do not include every firestopping or sealant condition in the Project. All items necessary for the completion of work shall be required whether or not they are shown on the documents, but are inferable as being necessary to provide the intended results.

- B. Contractor is advised to carefully review all drawings with special emphasis on the Mechanical, Electrical & Plumbing Drawings prior to bid for number & size penetrations in floors and Fire Rated Assemblies and include cost of all Fire Sealant & Fire Proofing Assemblies in his bid. These drawings are diagrammatic in nature and may not indicate the exact location or size of penetrations.

- C. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

- D. Installed Fire Sealant & Fire Proofing Assemblies shall comply with current NFPA Codes, IBC codes and the State Fire Marshal requirements.

- E. Through Penetrations shall be protected by an approved penetration Firestop system installed and as tested in accordance with ASTM E 814 or UL 1479 per International Building Code Section 714.3.1.2.

1.3 DEFINITIONS

- A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.

1.4 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

Only tested firestop systems shall be used in specific locations as follows:

- A. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), and vertical service shaft walls and partitions.
- B. Openings between structurally separate sections of wall or floors.
- D. Gaps between the top of fire rated walls and beams, ceilings or roof.
- E. Openings and penetrations in fire-rated partitions or walls containing fire doors.

1.5 REFERENCES

- A. Test Requirements: ASTM E-814, "Standard Method of Fire Tests of Through Penetration Fire Stops"

- B. Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their "FIRE RESISTANCE DIRECTORY" that is updated annually.
 - 1. UL Fire Resistance Directory:
 - a. Firestop Devices (XHJI)
 - b. Fire Resistance Ratings (BXUV)
 - c. Through-Penetration Firestop Systems (XHEZ)
 - d. Fill, Voids, or Cavity Material (XHHW)
 - e. Forming Materials (XHKU)
 - f. Duct wrap systems UL File R8418)
 - g. Electrical cable trays (UL 1709)
- C. Test Requirements: UL 2079, "Tests for Fire Resistance of Building Joint Systems"
- D. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments
- E. ASTM E-84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- F. All major building codes: ICBO, SBCCI, BOCA, and IBC.
(Note to specifier: Retain or delete building codes listed above as applicable)
- G. NFPA 101 - Life Safety Code
- H. NFPA 70 - National Electric Code

1.6 QUALITY ASSURANCE

- A. A manufacturer's direct representative (not distributor or agent) to be on-site during initial installation of firestop systems to train appropriate contractor personnel in proper selection and installation procedures. This will be done per manufacturer's written recommendations published in their literature and drawing details.
- B. Firestop System installation must meet requirements of ASTM E-814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.
- C. Proposed firestop materials and methods shall conform to applicable governing codes having local jurisdiction.
- D. Firestop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.
- E. For those firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgment drawings must follow requirements set forth by the International Firestop Council (September 7, 1994, as may be amended from time to time).
- F. **Firestop Contractor shall be a full time licensed Firestop Contractor trained & experienced with the installation of fire stopping materials on commercial buildings.**

1.7 COORDINATION

- A. General Contractor shall coordinate with all trades that will penetrate a rated system regarding responsibility(ies) of fire sealing penetrations. All trades shall utilize the same product/system to ensure the entire project is protected with single source manufactured system.

1.8 SUBMITTALS

- A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of UL firestop systems to be used and manufacturer's installation instructions to comply with Section 01 33 00.
- B. Manufacturer's engineering judgment identification number and drawing details when no UL system is available for an application. Engineer judgment must include both project name and contractor's name who will install firestop system as described in drawing.
- C. Submit material installation data sheets for each condition to Architect and General Contractor so that the General Contractor can provide to Fire Marshal when requested.

1.9 INSTALLER QUALIFICATIONS

- A. **Engage an experienced Firestop Contractor who specializes in fire stopping.** He shall be certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.
- B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.
- C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.
- D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.
- E. Do not use damaged or expired materials.

1.11 PROJECT CONDITIONS

- A. Do not use materials that contain flammable solvents.
- B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.
- C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
- D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.
- E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

PART 2 - PRODUCTS

2.1 FIRESTOPPING, GENERAL

- A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.
- B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the Underwriters Laboratories for the designated fire-resistance-rated systems.
- C. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed. Provide cast-in-place firestop devices prior to concrete placement.

2.2 ACCEPTABLE MANUFACTURERS

- A. Subject to U.L. compliance with through penetration firestop systems & devices, joint systems, fill, void or cavity material listed in Volume II of the UL Fire Resistance Directory, provide products of the following manufacturers as identified below:
 1. Hilti, Inc.
 2. 3M Brand Fire Protection Products
 3. Tremco, Inc.
 4. ProSet Systems Inc.
 5. Equivalent Manufacturers listed in the U.L. Fire Resistance Directory – Volume 2

2.3 MATERIALS

- A. Use only firestop products that have been UL 1479, ASTM E-814, or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

- B. Cast-in place firestop devices for use with non-combustible and combustible plastic pipe (closed and open piping systems) penetrating concrete floors, the following products are acceptable:
 1. Hilti or 3M Cast-In Place Firestop Device
 2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:
 1. Hilti or 3M Intumescent Firestop Sealant
 2. Hilti or 3M Self-leveling Firestop Sealant
 3. Hilti or 3M Fire Foam
 4. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:
 1. Hilti or 3 M Elastomeric Firestop Sealant
 2. Hilti or 3 M Flexible Firestop Sealant
 3. Hilti or 3 M Intumescent Firestop Sealant
 4. Hilti or 3 M Self-leveling Firestop Sealant
 5. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- E. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:
 1. Hilti or 3 M Speed Spray
 2. Hilti or 3 M Elastomeric Firestop Sealant
 3. Hilti or 3 M Flexible Firestop Sealant
 4. Hilti or 3 M Self-leveling Firestop Sealant
 5. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- F. Pre-formed mineral wool designed to fit flutes of metal profile deck; as a backer for spray material.
 1. Hilti or 3 M Speed Plugs
 2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- G. Intumescent sealants, caulking materials or foams for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:
 1. Hilti or 3 M Intumescent Firestop Sealant
 2. Hilti or 3 M Fire Foam
 3. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- H. Intumescent sealants, foams, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
 1. Hilti or 3 M Intumescent Firestop Sealant
 2. Hilti or 3 M Firestop Putty Stick
 3. Hilti or 3 M Fire Foam
 4. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- I. Non curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles, the following products are acceptable:
 1. Hilti or 3 M Firestop Putty Stick
 2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- J. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:
 1. Hilti or 3 M Firestop Putty Pad
 2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 1
- K. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:
 1. Hilti or 3 M Firestop Collar
 2. Hilti or 3 M Firestop Collar
 3. Hilti or 3 M Wrap Strips
 4. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- L. Materials used for complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti or 3 M Trowelable Firestop Compound
 2. Hilti or 3 M FIRE BLOCK
 3. Hilti or 3 M Fire Foam
 4. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- M. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:
1. Hilti or 3 M FIRE BLOCK
 2. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- N. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:
1. Hilti or 3 M Speed Spray
 2. Hilti or 3 M Elastomeric Firestop Sealant
 3. Hilti or 3 M Flexible Firestop Sealant
 4. Hilti or 3 M Self-Leveling Firestop Sealant
 5. Equivalent products listed in the U.L. Fire Resistance Directory – Volume 2
- O. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.
- P. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction being penetrated.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
1. Verify penetrations are properly sized and in suitable condition for application of materials.
 2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
 3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
 4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
 5. Do not proceed until unsatisfactory conditions have been corrected.

3.2 COORDINATION

- A. Coordinate location and proper selection of cast-in-place Firestop Devices with trade responsible for the work. Ensure device is installed before placement of concrete.
- B. Responsible trade to provide adequate spacing of field run pipes to allow for installation of cast-in-place firestop devices without interference's.

3.3 INSTALLATION

- A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory.
- B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.
1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
 2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
 3. Protect materials from damage on surfaces subjected to traffic.

3.4 FIELD QUALITY CONTROL

- A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.

- C. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.

3.5 ADJUSTING AND CLEANING

- A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.
 B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

PART 4 – U.L. TESTED SYSTEM SCHEDULES

SCHEDULES OF THROUGH PENETRATION FIRESTOP SYSTEMS

A. CONCRETE	----- --	A. FLOORS	B. CONCRETE	----OR-----	B. BLOCK WALLS
TYPE OF PENETRANT	F-RATING (HRS)	UL-CLASSIFIED SYSTEM	TYPE OF PENETRANT	F-RATING (HRS)	UL-CLASSIFIED SYSTEM
CIRCULAR BLANK OPENINGS	1	FA 0006, CAJ 0055, CAJ 0070	CIRCULAR BLANK OPENINGS	1	CAJ 0055, CAJ 0070
	2	FA 0006, CAJ 0055, CAJ 0070		2	CAJ 0055, CAJ 0070
	3	FA 0006, CAJ 0055		3	CAJ 0055
SINGLE METAL PIPES OR CONDUIT	1	CAJ 1226, FA 1017	SINGLE METAL PIPES OR CONDUIT	1	CAJ 1226, WJ 1021
	2	CAJ 1226, FA 1017		2	CAJ 1226, WJ 1021
	3	CAJ 1226, FA 1017		3	CAJ 1226, WJ 1041, WJ 1042
	4	CBJ 1037, CBJ 1034		4	CBJ 1034, CBJ 1037, WJ 1041, WJ 1042
SINGLE NON-METALLIC PIPE OR CONDUIT	1	FA 2053, FA 2025, CAJ 2109, CAJ 2098, CAJ 2141, CAJ 2167, CBJ 2021	SINGLE NON-METALLIC PIPE OR CONDUIT (I.E. PVC, CPVC, ABS, FRP, ENT)	1	CAJ 2109, CAJ 2098, CAJ 2167
	2	FA 2053, FA 2025, CAJ 2109, CAJ 2098, CAJ 2141, CAJ 2167, CBJ-2021		2	CAJ 2109, CAJ 2098, CAJ 2167
	3	FA 2054, CAJ 2109, CAJ 2098		3	CAJ 2109, CAJ 2098
				4	WJ 2057
SINGLE OR BUNDLED CABLES	1	FA 3007, CAJ 3095, CAJ 3096	SINGLE OR BUNDLED CABLES	1	WJ 3036, CAJ 3095, CAJ 3096
	2	FA 3007, CAJ 3095, CAJ 3096		2	WJ 3036, CAJ 3095, CAJ 3096
	3	FA 3007, CAJ 3095, CAJ 3096		3	CAJ 3095, CAJ 3096
				4	WJ 3050
CABLE TRAY	1	CAJ 4034, CAJ 4035	CABLE TRAY	1	WJ 4016, CAJ 4034, CAJ 4035

	2	CAJ 4034, CAJ 4035		2	WJ 4016, CAJ 4034, CAJ 4035
	3	CAJ 4034, CAJ 4035		3	CAJ 4034, CAJ 4035
				4	WJ 8007
SINGLE INSULATED PIPES	1	FA 5015, FA 5016, CAJ 5090, CAJ 5091, CAJ 5098	SINGLE INSULATED PIPES	1	CAJ 5090, CAJ 5091, CAJ 5061
	2	FA 5015, FA 5016, CAJ 5090, CAJ 5091, CAJ 5098		2	CAJ 5090, CAJ 5091, CAJ 5061
	3	FA 5016, CAJ 5090		3	CAJ 5090, CAJ 5061
	4	CBJ 5006		4	CBJ 5006, WJ 5028
ELECTRICAL BUSWAY	1	CAJ 6006, CAJ 6017	ELECTRICAL BUSWAY	1	CAJ 6006, CAJ 6017
	2	CAJ 6006, CAJ 6017		2	CAJ 6006, CAJ 6017
	3	CAJ 6006, CAJ 6017		3	CAJ 6006, CAJ 6017
NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	CAJ 7046, CAJ 7051	NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	CAJ 7046, CAJ 7051, WJ 7021, WJ 7022
	2	CAJ 7046, CAJ 7051		2	CAJ 7046, CAJ 7051, WJ 7021, WJ 7022
	3	CAJ 7046, CAJ 7051		3	CAJ 7046, CAJ 7051
MIXED PENETRANTS	1	CAJ 8041, CAJ 8056	MIXED PENETRANTS	1	CAJ 8041, CAJ 8056, WJ 8007
	2	CAJ 8041, CAJ 8056		2	CAJ 8041, CAJ 8056, WJ 8007
	3	CAJ 8041, CAJ 8056		3	CAJ 8041, CAJ 8056, WJ 8007
	4	CBJ 8010		4	CBJ 8010, WJ 8007
WOOD		FLOOR	GYPSUM WALLBOARD		ASSEMBLY
TYPE OF PENETRANT	F-RATING (HRS)	UL-CLASSIFIED SYSTEM	TYPE OF PENETRANT	F-RATING (HRS)	UL-CLASSIFIED SYSTEM
METAL PIPES OR CONDUIT	1	FC 1009, FC 1059	METAL PIPES OR CONDUIT	1	WL 1054, WL 1058, WL 1164
	2	FC 1009, FC 1059		2	WL 1054, WL 1058, WL 1164
				4	WL 1110, WL 1111
NON-METALLIC PIPE OR CONDUIT	1	FC 2025, FC 2030, FC 2160	NON-METALLIC PIPE OR CONDUIT	1	WL 2078, WL 2075, WL 2128
	2	FC 2025, FC 2029, FC 2128		2	WL 2078, WL 2075, WL 2128
				4	WL 2184
SINGLE OR BUNDLED CABLES	1	FC 3012, FC 3044	SINGLE OR BUNDLED CABLES	1	WL 3065, WL 3111, WL 3112

	2	FC 3012		2	WL 3065, WL 3111, WL 3112
				4	WL 3139
INSULATED PIPES	1	FC 5004, FC 3036, FC 3037	CABLE TRAY	1	WL 4011, WL 4019
				2	WL 4011, WL 4019
	2	FC 5004, FC 3036 FC 3037		4	WL 8014
NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	FC 7013	INSULATED PIPES	1	WL 5028, WL 5029, WL 5047
				2	WL 5028, WL 5029, WL 5047
				4	WL 5073
			NON-INSULATED MECHANICAL DUCTWORK WITHOUT DAMPERS	1	WL 7017, WL 7040, WL 7042
				2	WL 7040, WL 7042
				4	
MIXED PENETRANTS	1	FC 8009, FC 8014	MIXED PENETRANTS	1	WL 1095, WL 8013
				2	WL 1095, WL 8013
				4	WL 8014

NOTES:

1. Jobsite conditions of each through-penetration firestop system must meet ALL details of the UL-Classified System selected.
2. If jobsite conditions do not match any UL-classified systems in the schedules above, contact Hilti for alternative systems or Engineer Judgment Drawings
3. Where more than one applicable UL-Classified System is listed in the schedules, choose the UL System which is most economical for each through-penetration firestop system. Above listed UL-classified systems are by Hilti, other similar approved manufacturer's UL-classified systems can be found in the UL Directory Vol. 2, within a few digits of the Hilti system number.
4. Coordinate work with other trades to assure that penetration opening sizes are appropriate for penetrant locations, and vice versa.
5. For 3-hour rated gypsum walls, contact Hilti for a UL-classified system or engineer judgment drawing.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.
- B. Related Sections include the following:
1. Section 07 21 00 "Thermal Insulation" for coordination of Building Thermal Envelope Air Sealing.
 2. Section 07 84 00 "Firestopping" for fire related joints and accessories.
 3. Section 08 80 00 "Glazing" for glazing sealants.
 4. Section 09 21 16 "Gypsum Board Assemblies" for sealing perimeter joints of gypsum board partitions to reduce sound transmission.
 5. Section 09 30 13 "Tiling" for sealing tile joints.
 6. Section 09 90 00 "Paint" for caulking.

1.2 SUMMARY

- A. This Section includes sealants for the following applications, including those specified by reference to this Section. The Design Intent is to include all items required for the completion of sealant work.
- B. Provide sealant & backer rods as necessary for the complete installation of materials indicated on the Drawings and Specification Sections, including but not limited to the following:
1. Joints in exterior concrete walking surfaces
 2. Joints in exterior concrete curb & gutters.
 3. Joints between metal flashing pieces.
 4. Fire sealant at joint between gypsum board wall and structure and round all openings, equipment, plugs, switches, penetrations in Party Walls between Apartment Units.
 5. Control and expansion joints where indicated.
 6. Perimeter joints around all doors, windows and louvers.
 7. Tile control and expansion joints.
 9. Perimeter joints between interior wall surfaces and frames of interior doors, windows.
 10. Joints between plumbing fixtures and adjoining walls, floors and counters.
 11. Other joints in construction where two different materials butt and a visible seam exists.
- ~~12. **Building Thermal Envelope** shall be sealed airtight including all joints, seams, penetrations, gaps, voids, annular space thru all exterior shell materials of roof, walls & ceilings and common walls between Apartment Units. Include dryer vent penetrations, bath vent penetrations, range hood penetrations, ice maker box penetration, HVAC fresh air duct penetrations, etc. Include all penetrations made by structural, plumbing, mechanical and electrical Divisions.~~
- ~~Caulk bottom plate to slab at exterior walls. Seal all visible gaps in wall and floor sheathing. Seal windows and doors to framing. Install rigid air barrier behind chases on exterior wall and framed soffits. Seal shower and tub drains. Seal all pipes and wires at top and bottom plates. Seal top and interior walls of any chases smoke tight. Caulk electrical Boxes, plumbing pipes, and other gaps in exterior walls and ceiling. Seal all gaps in Drywall at mechanical closets. Caulk all HVAC boots and bath fans to drywall. Caulk washer and dryer boxes to Drywall. Seal attic access hatch to framing.~~ **NOT REQUIRED FOR EXISTING BUILDINGS**
- ~~13. **If required by Code Official The Testing of Building Thermal Envelope air sealing (Blower Door Test) is provided by General Contractor who shall be responsible for repairing or replacing all materials/equipment at no additional cost that does not meet criteria needed to pass the Blower Door Test.** **NOT REQUIRED FOR EXISTING BUILDINGS**~~

1.3 PERFORMANCE REQUIREMENTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications

for type, grade, class and uses related to exposure and joint substrates.

- B. Building Exterior: Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.
- C. Building Interior: Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.
- D. Sealant shall be SWRI validated at time of Bids. Sealant, Waterproofing, and Restoration Institute (SWRI): www.swrionline.org:

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Qualification Data: For qualified Installer.
- E. Product Certificates: SWRI Certificates for each kind of joint sealant and accessory, from manufacturer.
- F. Preconstruction compatibility and adhesion test reports.
- G. Preconstruction field-adhesion test reports.
- H. Field quality control adhesion test reports.
- I. Sample of unexecuted manufacturer & installer special warranties.

1.5 BIDDING REQUIREMENTS:

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Experienced installer who has specialized and successfully installed joint sealants similar in material, design, and extent to those indicated for this Project.
- B. Single Source Responsibility: Purchase each type of joint sealant through one source from a single manufacturer.
- C. Pre-construction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 1. Use ASTM C 1193 Method A or method recommended by manufacturer to determine under similar site conditions if priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 2. Allow ample time for testing and analyzing results to prevent delaying the Work.
 3. For materials failing tests, obtain joint sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
 4. Testing may not be required if joint sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- D. Mockup: Prepare mockup samples for adhesion test and appearance satisfactory to Architect. Provide 1 mockup per joint type and joint size for each condition. Adjust & receive Architect's approval prior to final installation.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.8 PROJECT CONDITIONS

- A. When ambient and substrate temperature conditions are outside limits permitted by joint- sealant manufacturer or are below 40 deg F (5 deg C).
- B. When joint substrates are wet.
- C. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
- D. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY

- A. Special Installer's Warranty: Original statement on Installer's letterhead in which Installer agrees to repair or replace joint sealants that demonstrate deterioration or failure within warranty period specified.
 - 1. Warranty Period: Five years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Minimum of 20 years from date of Substantial Completion.
- C. Warranty Conditions: Special warranties exclude deterioration or failure of joint sealants in normal use due to structural movement resulting in stresses on joint sealants exceeding sealant manufacturer's written specifications, joint substrate deterioration, mechanical damage, or normal accumulation of dirt or other contaminants. The manufacturer's labor and material guarantee shall guarantee, at the manufacturer's own cost and expense, to make or cause to be made such re-applications of, and to correct any and all faulty installations/applications. Provide sample guarantee with Material submittal.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. SITE PAVING: Single-Component, Nonsag, Silicone Joint Sealant: Type S, Grade NS, Class 100/50, for Use NT & T.
 - 1. Products:
 - a. Dow Corning Corp.; 890-SL
 - b. Pecora Corporation; 300 Pavement Sealant
 - c. Approved equal.
 - 2. Applications: Concrete and asphalt pavements.
- B. EXTERIOR FAÇADE: Single-Component, Nonsag, Silicone Joint Sealant: Type S, Grade NS, Class 50, for Use NT. Color shall be custom to match adjacent wall material such as brick.
 - 1. Products:
 - a. Dow Corning Corp.; 790
 - b. Pecora Corporation; 864(with primer)
 - c. Approved equal.
 - 2. Applications: Including, but not limited to, concrete sill, perimeter of interior and exterior door, window and storefront frames; around interior and exterior electrical and mechanical fixtures; glazing; HVAC duct penetrations in finished walls; coping joints; interior and exterior control and expansion joints, brick, stucco, etc.
- C. INTERIOR: Single-Component, Paintable Latex Sealant LS-1: Comply with ASTM C 834, Type P, Grade NF.
 - 1. Products:
 - a. Pecora Corporation; AC-20 +.
 - b. Sonneborn, Division of BASF; Sonolac.

- c. Tremco; Tremflex 834.
 - d. Approved equal.
 - 2. Applications: Including, but not limited to interior applications around drywall, counters, adjacent finishes.
- D. ACOUSTICAL : Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 to effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - 1. Products:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
 - c. Approved equal.
 - 2. Applications: Concealed & exposed joints in acoustical wall partitions including base, top of wall, around sound retarding doors and window openings, penetrations, etc.
- E. SMOKETIGHT : Manufacturer's nonsag, paintable, nonstaining latex sealant or foam that is capable of restricting the transfer of smoke shall be used to fill all voids around floor penetrations.

2.2 COMPATIBILITY

- A. Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2.3 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backer Rods: ASTM C 1330, Type C (closed-cell material with a surface skin) Type O (open-cell material) Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size(25% larger than joint width) and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable to eliminate "three sided adhesion".

2.4 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from pre-construction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Only proceed with installation after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:
1. All foreign material shall be removed from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Porous joint substrate surfaces shall be cleaned by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:
 - a. Concrete
 - b. Concrete Masonry Units
 - c. Unglazed surfaces of ceramic tile
 - d. Stucco
 - e. Brick
 3. Laitance and form-release agents shall be removed from concrete.
 4. Clean non-porous surfaces with cleaners or other means being careful not to stain, harm substrates or leave residues capable of interfering with adhesion of joint sealants.
 - a. Metal
 - b. Glass
 - c. Porcelain enamel
 - d. Glazed surfaces of ceramic tile
- B. Prime joint substrates where recommended in writing by joint sealant manufacturer, based on joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Use masking tape as required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained, scratched or damaged by sealant or cleaning methods. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Comply with recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. After priming, install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shape of an hourglass and depths of installed sealants half to joint widths to allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings shall not be allowed.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application shall be removed and replaced with dry materials.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and substrate to ensure that the sealant only bonds to moving materials.
- F. Using proven techniques, install sealants to comply with the following and at the same time backings are installed:
 1. Place sealants so they directly contact and fully wet joint substrates.

2. Completely fill recesses provided for each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealants shall be promptly removed from surfaces adjacent to joint.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 4. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated.
 5. Provide recessed joint configuration, per Figure 5C in ASTM C 1193, of recess depth and at locations indicated.
 - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
- H. Refer to Drawings for sealant details and requirements.

3.4 CLEANING

- A. Carefully clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period until Substantial Completion.
- B. Remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

3.6 JOINT – SEALANT APPLICATION SCHEDULE

- A. Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Perimeter joints between materials listed above and frames of doors, windows, & louvers.
 - b. Other joints as indicated.
 2. Urethane Joint Sealant: Single component, nonsag, Class 25.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Perimeter joints of exterior openings where indicated.
 - b. Vertical joints on exposed surfaces of walls and partitions.
 - c. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
 - d. Other joints as indicated.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Sealant Location:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Other joints as indicated.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION

SECTION 08 11 13 – HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Related Sections include the following:
1. Section 08 71 00 "Door Hardware" for hollow metal door hardware.
 2. Section 08 80 00 "Glazing" for glass lites.
 3. Section 09 90 00 "Painting" for painting primed doors and frames.

1.3 SUMMARY

- A. This Section includes the following products:
1. Doors: Flush, hollow or composite hollow metal doors for interior and exterior locations.
 2. Frames: Pressed hollow metal frames for doors, transoms, sidelights, mullions, interior glazed panels, and other interior and exterior openings of the welded unit type:
 3. Assemblies: Provide hollow metal door and frame assemblies as required for labeled and fire rated door units.
 4. Provide factory primed doors and frames to be field painted.
 5. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

1.4 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 SUBMITTALS

- A. Submit product data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- B. Submit Shop Drawings indicating fabrication and installation of hollow metal doors and frames. Include details of each frame type, frame details for each door type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage, joints, connections, and accessory items, details of molding, removable stops and glazing.
1. Provide schedule of doors and frames using same reference designations for details and openings as those on Drawings.
 2. Provide details of glazing frames and stops with glass and glazing requirements.
 3. Indicate details of conduit and preparations for power, signal & control systems.
 4. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
 5. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.
- C. Samples for Verification:
1. 3 by 5 inches (75 by 127 mm) min. sample for each type of exposed finish required.
 2. 12 by 12 inches (305 by 305 mm) min. for "Doors" and "Frames" to demonstrate compliance with requirements for quality of materials and construction:
- D. Schedule: Include a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.6 QUALITY ASSURANCE

- Shall meet all requirements and recommendations of the latest editions of the Codes and Standards listed:
- A. American Society for Testing and Materials: ASTM E - 152-73

- B. ANSI/SD1 - 100 - 85 Recommended Specifications Standard Steel Doors and Frames.
- C. Comply with applicable requirements of Steel Door Institute S.D.I 100, and Commercial Standard CS242, latest edition, except as revised by specific requirements of the Section.
- D. "Hollow Metal Technical Design Manual" National Association of Architectural Metal Manufacturers (NAAMM)
- E. NFPA No. 80 (Fire Rated Doors, Frames and Windows) & NFPA 252. A metal label shall be affixed to all Underwriters' Laboratories classified fire doors, listed fire door frames or Factory Mutual approved fire doors and frames as evidence of compliance with procedures of the labeling agencies.
- F. 2009 International Building Code

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished areas are completely undetectable when complete and equal in all respects to new work. Repairs shall be acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum wood blocking. Use vented plastic or canvas shelters which release trapped humidity. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inch spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering standard steel doors and frames which may be incorporated in the work include:
 - 1. Standard Steel Doors and Frames:
 - a. Amweld International, LLC
 - b. Ceco Corp.
 - c. Curries Co.
 - d. Fenestra Corp.
 - e. Kewanee Corp.
 - f. Pioneer Industries.
 - g. Republic Builders Products.
 - h. Steelcraft Manufacturing Co.
 - i. Prior approved equal.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.
- B. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, or drawing quality, ASTM A 642, hot dipped galvanized in accordance with ASTM A 525, with A60 or G60 coating designation, mill phosphatized.
- C. Supports and Anchors: Fabricate of not less than 18-gage sheet steel; galvanized where used with galvanized frames. Wall anchors in masonry construction may be .177 inch diameter galvanized steel wire complying with ASTM A 510.
- D. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable.
- E. Shop Applied Paint: Apply after fabrication.
 - 1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

2.3 DOORS

- A. Provide metal doors of SDI grades and models specified below or as indicated on drawings:
 - 1. Interior Doors: ANSI/SDI-100, 18-gage cold-rolled sheet steel faces.
 - 2. Exterior Doors: ANSI/SDI-100, 16-gage cold-rolled sheet steel faces. Fabricated as thermal insulating door/frame assemblies and tested in accordance with ASTM C 1363 (min. 2.1 R-value).
- B. Door Louvers: Provide sight-proof stationary louvers for interior doors where indicated, constructed of inverted V-shaped or Y-shaped blades formed of 24-gage cold-rolled steel set into minimum 20-gage steel frame.
- C. Doors Factory Glazed: Insulating-Glass Units for Ext. Doors where indicated on plans: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, & complying with ASTM E 774.
 - 1. GL1 – PPG I.G. 5/8" insulated temp. glass, (1/8" tinted outboard lite with dark aesthetic low-e coating on the #2 face, 3/8" air spacer, and 1/8" clear tempered inboard lite).
 - 2. GL1 – Viracon 5/8" insulated temp. glass, made up of (1/8" tinted outboard lite with low-e dark coating on the #2 face, 3/8" air spacer, and 1/8" clear tempered inboard lite).
 - 3. GL-1 – Approved equal with equal or greater performance as types (1. and 2.)
 - 4. (Tint color as selected by architect)

2.4 FRAMES

- A. Provide "full profile welded" metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16-gage cold-rolled steel for interior openings and (14-gage cold rolled steel for exterior openings) all frames with mitered, welded corners and seamless face joints.
- B. Door Silencers: Except on weather-stripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.
- C. Plaster Guards: Provide minimum 26-gage steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
 - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.6 FABRICATION

- A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory- assembled before shipment, to assure proper assembly at project site. Comply with ANSI/SDI-100 requirements.
 - 1. Internal Construction: Manufacturer's standard honeycomb, polyurethane, polystyrene, unitized steel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate in accordance with SDI standards.

- B. Clearances: Comply with NFPA 80 for fire rated doors. For non-rated doors 3/4 inch is maximum space allowed at bottom (sill) and 1/8 in is maximum space allowed at head and jamb, except for a pair of doors where 1/4 inch is maximum space allowed.
- C. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel.
- D. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- E. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.
- F. Fabricate exterior doors, panels, and frames from galvanized sheet steel in accordance with SDI-112. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gage inverted steel channels. Provide weep hole openings in door bottom.
- G. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- H. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.
 - 1. For concealed overhead door closers, provide space, cutouts, reinforcing and provisions for fastening in top rail of doors or head of frames, as applicable.
- I. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.
- J. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.
- K. Shop Painting: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.
 - 1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.
 - 2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.
- L. Glazing Stops: Minimum 20 gage steel.
 - 1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
 - 2. Provide screw applied removable glazing beads on inside of glass, louvers, and other panels in doors.
- M. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 - 4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 5. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:

- 1) Two anchors per jamb up to 60 inches (1524 mm) high.
- 2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
- 3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
- 4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.
- b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches (1524 mm) high.
 - 2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
 - 3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.
- c. Compression Type: Not less than two anchors in each frame.
- d. Post installed Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.
6. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
7. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Proceed with installation only after all unsatisfactory conditions have been corrected.
- B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - c. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post installed expansion anchors.
 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 4. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).

- b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
 - c. At Bottom of Door: 5/8 inch (15.8 mm) plus or minus 1/32 inch (0.8 mm).
 - d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
- 2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
 - 3. Smoke-Control Doors: Install doors and gaskets according to NFPA 105.
 - 4. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.2 ADJUST AND CLEAN

- A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
- B. Protection Removal: Immediately prior to Substantial Completion, remove protective plastic wrappings from prefinished doors.
- C. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition. Door closures and hardware shall be adjusted to comply with ADAAG requirements.

END OF SECTION

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 RELATED SECTIONS

- A. Related Sections include the following:
 - 1. Section 08 70 00 Door Hardware for hardware requirements on each door.

1.3 SUMMARY

- A. This Section includes the following:
 - 1. Solid core doors with wood veneer faces.
 - 2. Metal frames for light openings for flush wood doors.
 - 3. Factory finishing of wood doors.
- B. The Design Intent is that all door openings with a door shown shall have door. Should a door number be inadvertently left off of the plan, provide door matching the nearest similar adjacent door.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each type of door, including details of core and edge construction, trim for openings and louvers, and factory-finishing specifications.
- C. Shop Drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for veneer matching and factory finishing and other pertinent data.
- D. Samples for verification in the form and size indicated below:
 - 1. Corner sections of doors approximately 12 inches (300 mm) square with door faces and edgings representing the typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.
 - 2. Frames for light openings, 6 inches (150 mm) long, for each material, type, and finish required.

1.5 QUALITY ASSURANCE

- A. Quality Standard: Comply with the following standard:
 - 1. NWWDA Quality Standard: "Architectural Wood Flush Doors," of the National Wood Window and Door Association.
 - 2. AWI Quality Standard: "Architectural Woodwork Standards" latest edition for grade of door, core, construction, finish, and other requirements.
 - 3. Association Quality Assurance Program. Bidders shall be current members of the Architectural Woodwork Institute. Bidders shall be Association program participants or they shall understand that their work (fabrication only, not installation) shall be inspected by an Association program representative. Include in Bid the cost of Inspection and remedial work for AWI compliance.
- B. Fire-Rated Wood Doors: Provide wood doors that comply with NFPA 80; are identical in materials and construction to units tested in door and frame assemblies per ASTM E 152; and are labeled and listed by UL, Warnock Hersey, or another testing and inspection agency acceptable to authorities having jurisdiction.
- C. Single-Source Responsibility: Obtain doors from one source and by a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's instructions.
- B. Identify each door with individual opening numbers as designated on shop drawings, using temporary, removable or concealed markings.

1.7 PROJECT CONDITIONS

- A. Conditioning: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.8 WARRANTY

- A. General Warranty: Door manufacturer's warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents
- B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by manufacturer, Installer, and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch (6.35 mm) in a 42-by-84-inch (1067-by-2134-mm) section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span, or do not conform to tolerance limitations of referenced quality standards.
 - 1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.
 - 2. Warranty shall be in effect during the following period of time after date of Substantial Completion.
 - a. Solid Core Interior Doors: Life of installation.

1.9 BIDDING REQUIREMENTS:

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering doors that may be incorporated in the Work include, include the following:
 - 1. Solid Core Doors:
 - a. Ampco Products, Inc.
 - b. Buell Door Co.
 - c. Chappell Door Co.
 - d. Eggers Industries, Architectural Door Division.
 - e. Fenestra Corporation.
 - f. Mohawk Flush Doors, Inc.
 - g. VT industries, Inc
 - h. Weyerhauser Co.
 - i. Prior approved equal.

2.2 INTERIOR FLUSH WOOD DOORS

- A. Solid Core Doors for Manufacturers Pre-finishing w/ Transparent Finish: Comply with the following requirements:
1. Faces: **Rotary cut Red Oak**
 2. Grade: Premium.
 3. Construction: AWI PC 5.
 4. Core: Particleboard core.
 5. Bonding: Stiles and rails bonded to core, then entire unit abrasive planed before veneering.

2.3 GENERAL DOOR CONSTRUCTION

- A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.
- B. WDMA Performance Grade:
1. Extra Heavy Duty unless otherwise indicated.
- C. Particleboard-Core Doors:
1. Particleboard: ANSI A208.1.
 2. Blocking: Provide wood blocking in particleboard-core doors as follows:
 - a. 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
 - b. 5-inch (125-mm) bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
 - c. 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.
 3. Provide doors with either glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.
- D. Structural-Composite-Lumber-Core Doors:
1. Structural Composite Lumber: WDMA I.S.10.
 - a. Screw Withdrawal, Face: 700 lbf (3100 N).
 - b. Screw Withdrawal, Edge: 400 lbf (1780 N).
- E. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated. Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges. For pairs of fire rated doors, provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
- F. Mineral-Core Doors: Noncombustible mineral product core complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as follows:
1. 5-inch (125-mm) top-rail blocking.
 2. 5-inch (125-mm) bottom-rail blocking, in doors indicated to have protection plates.
 3. 5-inch (125-mm) midrail blocking, in doors indicated to have armor plates.
 4. 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.
- G. Mineral-Core Door Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw- holding capability and split resistance. Comply with specified requirements for exposed edges.

2.4 LIGHT FRAMES

- A. Metal Frames for Light Openings in Fire Doors: Manufacturer's standard frame formed of 0.0478-inch- (1.2-mm-) thick cold-rolled steel sheet, factory primed, and approved for use in doors of fire-rating indicated.

2.5 FABRICATION

- A. Fabricate flush wood doors to comply with following requirements:
 - 1. In sizes indicated for job-site fitting.
 - a. Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements of NFPA 80 for fire-resistance-rated doors.
 - 2. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame shop drawings, DHI A115-W series standards, and hardware templates. Factory pre-drilled pilot holes for attachment of hinges and lockfronts.
 - a. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory machining.
- B. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.
 - 2. Door grilles: Pre-finished aluminum fixed louvers with flanged frame, sight proof, and auxiliary frame.
Acceptable manufacturers: Metalaire dg-df, Titus t-700-bf, Price stg-1, or prior approved equal in Compliance with section 01 25 00.
- C. Pairs of Doors: Shall have grain matched across both doors.

2.6 FACTORY FINISHING WOOD DOORS

- A. Comply with AWI quality standards requirements for factory finishing.
- B. Finish wood doors at factory. Architect to supply color upon approval from Owner.
- C. Comply with requirements indicated.
 - 1. Grade: Premium
 - 2. Finish: AWI System TR-6 catalyzed polyurethane.
 - 3. Staining: As selected by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine installed door frames prior to hanging door:
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
 - 2. Reject doors with defects.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation see Division 8 Section "Door Hardware."
- B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and referenced quality standard and as indicated.
 - 1. Install fire-rated doors in corresponding fire-rated frames according to requirements of NFPA 80.
- B. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.

1. Fitting Clearances for Non-Fire-Rated Doors: Provide 1/8 inch (3.2 mm) at jambs and heads, 1/16 inch (1.6 mm) per leaf at meeting stiles for pairs of doors, and 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4-inch (6.4-mm) clearance from bottom of door to top of threshold.
2. Fitting Clearances for Fire-Rated Doors: Comply with NFPA 80.
3. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
4. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) on lock edge; trim stiles and rails only to extent permitted by labeling agency.

3.3 ADJUSTING AND PROTECTION

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 08 14 33 - STILE & RAIL DOORS

PART 1 - GENERAL

1.01 GENERAL

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.02 WORK INCLUDES

Work includes all interior Masonite doors and fire rated doors as indicated on Plans and indicated in Schedules.

1.03 REFERENCES

Shall meet all requirements and recommendations of the latest edition of the Codes and Standards listed below:

- A. American Woodwork Institute, AWI TYPE SLC
- B. National Woodwork Manufacturing Association
- C. American Society for Testing and Materials
- D. National Fire Protection Association (NFPA 101)
- E. NSDJA 1-79 for pre-hung units.

1.04 SUBMITTALS AND SHOP DRAWINGS

Submit shop drawings on all doors in accord with other Sections if this Specification.

1.05 COORDINATING

The contractor shall make every effort to coordinate the work of the frame manufacturer, the wood door manufacturer-supplier and the hardware supplier so that schedules, shop drawings and details prepared by the above will be submitted to the Architect for review in a concise, orderly and easily read manner, using the Architect's door mark & heading.

PART 2 - PRODUCTS

2.01 MANUFACTURER

All wood or masonite doors shall be solid core as manufactured by Masonite, Simpson Door, Steves & Son, Weyerhaeuser, Eggers Industries.

2.02 MASONITE DOOR CONSTRUCTION - HOLLOW CORE PRE-HUNG

- A. Hollow core to be masonite, molded hardboard or MDF with louvers, raised panels, or flush as shown.
- B. Hinges shall be satin nickel.
- C. Frames shall be wood.
- D. Doors are pre-hung units.
- E. HVAC Closet doors with louvers for return air shall be solid core hardboard.

2.03 LABEL DOORS (where indicated)

- A. Flush veneered, staved lumber or particle board 45 min. doors; mineral core, meeting NFPA 1.2.1 Series, LLD 581 Type IV Class 3, and bearing appropriate U.L. Label.
- B. Doors indicated to be smoke-tight shall comply with NFPA 80 and maintain the clearances required.

PART 3 - EXECUTION**3.01 EXAMINATION AND INSPECTION**

- A. Prior to installation of wood doors and frames, carefully inspect the work of other trades, and determine that such work is complete to the point where this installation may properly commence.
- B. Verify that wood doors and frames be installed in strict accordance with all pertinent codes, original design, approved shop drawings and manufacturer's recommendations.
- C. Report any discrepancies or unsatisfactory conditions to the Architect. Do not commence this portion of the work until such conditions have been corrected and approved.

3.02 DELIVERING AND STORING

- A. Store doors and frames in upright position in a dry, protected area at least 1" off floor and with 1/4" air space between each time.
- B. Protect doors in such a manner as to prevent damage and deterioration. Any damaged door or frame shall be removed and replaced.

3.03 ERECTING AND INSTALLING

- A. Install all doors in strict accordance with all codes and standards, approved shop drawings and manufacturer's recommendations. Install all hardware specified in strict accordance with manufacturer's instructions.
- B. Install doors to open and close easily and smoothly. Doors shall be installed so as to stand stable at any position or angle.
- C. Use care and proper tools for hanging doors and installing hardware. All screws with burred heads shall be removed and replaced.
- C. Install air conditioning grilles supplied by mechanical contractor. See Mechanical drawings for size and locations.

3.04 UNDERCUTTING

- A. Trim door bottoms if required to allow 3/4" between door sill and finish floor surface for return air flow.
- B. Be careful not to over cut and weaken door.

3.05 FINISHING

All edges of door shall be finished, sanded and stained both faces, both edges, top and bottom (six surfaces).

3.06 CLEANING

After erection doors shall be cleaned of all soil, grease, or other extraneous materials and be prepared for painting. Any door or frame that cannot be satisfactorily cleaned shall be replaced.

END

SECTION 08 33 23 – SECTIONAL OVERHEAD DOORS**PART 1 - GENERAL****1.01 GENERAL CONDITIONS**

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.02 WORK INCLUDED

A. Work includes all material & labor for upward – acting sectional doors where indicated on plans. Include all items necessary for the completion of work whether or not they are shown in the documents, but are inferable as being necessary to provide the intended results. Include side mount motor operator controls, etc. Include all wiring, relay and required components, etc.

B. Related sections: other specification sections which directly relate to the work of this section include but are not limited to the following:

1. Section 05 50 00 – Structural & miscellaneous metal fabrications.
2. Section 07 92 00 – Joint sealers: Perimeter sealant & backup material.
2. Section 08 71 00 – Finish hardware: key cylinders for locks.
3. Section 09 90 00 – Painting: field painting.
4. Section 26 05 03 – Electrical wiring. (elec. Service for door operator)

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each type of sectional door. Include both published data and any specific data prepared for this project.
- B. Shop Drawings: Submit shop drawings for approval prior to fabrication. Include detailed plans, elevations, details of framing members, required clearances, anchors, & all accessories. Include relationship with adjacent materials.

1.05 QUALITY ASSURANCE

- A. Manufacturer: sectional doors shall be manufactured by a firm with a minimum of five years experience in the fabrication and installation of sectional doors. Manufacturers proposed for use, which are not named in these Specifications, shall submit evidence of ability to meet performance and fabrication requirements specified, and include a list of five projects of similar design and complexity completed within the past five years.
- B. Installer: Installation of sectional doors shall be performed by the authorized representative of the manufacturer.
- C. Single-Source Responsibility: Provide doors, guides, motors and related primary components from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- D. Pre-Installation Conference: Schedule and convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

1.06 DELIVERY, STORAGE AND HANDLING

Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturers instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

PART 2 - PRODUCTS**2.01 ACCEPTABLE MANUFACTURER**

Provide insulated sectional overhead doors equal to Products by Overhead Door Corporation, CHI, Clopay, Equal by Section 01 25 00.

2.02 GLAZED ARCHITECTURAL SERIES ALUMINUM FULL VIEW SECTIONAL OVERHEAD DOORS**A. 904U: Aluminum Full View Sectional Door, Polyurethane Insulated**

1. Maximum Door Size: 20 ft, 2 inches wide by 18 ft high.
2. Panel Sections: 2-1/8 inches thick extruded 6053-T5 aluminum. (equally spaced)
3. Rails and Stiles: Polyurethane foam injected.
4. Astragal: U-shaped flexible PVC in retainer of full-length 0.055 inch rigid PVC.
5. U-Factor: 0.86 (with clear insulated glass)
6. R-Value: 3.8 (with clear insulated glass)
7. Air Infiltration: 0.15cfm/ft²
8. Aluminum Finish: Black Anodized
9. Windows:
 - a. Glazing thickness 5/8-inch Polygal insulated unit
 - b. Glazing type: Tempered glass Low E Coated
 - c. Glazing tint: Gray
10. Locking:
 - b. Provide two inside slide locks with interlock
11. Weather-stripping: Provide complete perimeter seals. Provide flexible top seal, flexible jamb seal and U-shaped bottom seal
12. Track:
 - a. Provide track configuration to maximize headroom available per plans
 - b. 3 inches track designed for 3" diameter rollers. Vertical and horizontal tracks 08360-3 minimum 0.096 inch galvanized steel.
13. Spring Counterbalance: Torsion spring counterbalance mechanism sized to weight of the door, with high strength galvanized aircraft cable with minimum 7 to 1 safety factor. High Cycle Spring: 50,000 cycles.

B. Electric Motor Operation:**1. General:**

Provide electric door operator provided by door manufacturer for door with operational life specified complete with electric motor and factory pre-wired motor controls, starter, gear reduction unit, clutch, remote-control stations, control devices, integral gearing for locking door, and accessories required for proper operation. Comply with NFPA 70

a. Solenoid-operated brake

2. Disconnect Device: Provide hand-operated disconnect or mechanism for emergency manual operation while disconnecting motor, without affecting timing of limit switch. Mount disconnect and operator so they are accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.
3. Design operator so motor may be removed without disturbing limit switch adjustment and without affecting emergency auxiliary operator.
4. Provide control equipment complying with NEMA ICS1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V, AC or DC..
5. Electric Motors: Provide high-starting torque, reversible, continuous-duty, Class A insulated, electric motor, complying with NEMA MG 1, with overload protection, sized to start, accelerate, and operate door in either direction, from any position, at not less than 2/3 fps (0.2 m/s) and not more than 1 fps (.03m/s), without exceeding nameplate ratings or considering service factor.

HP:1/2 hp (373 W). 220 V. Service Factor: N/A

Coordinate wiring requirements and electrical characteristics of motors with building electrical system.

Remote Control Station: Provide momentary contact, 3-button control station with push - button controls labeled "Open", "Close" and "Stop.

Obstruction Detection Device: Provide each motorized door with indicated external automatic safety sensor able to protect full width of door opening. Activation of sensor immediately stops and reverses downward door travel

Sensor Edge: Provide each motorized door with an automatic safety sensing edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor immediately stops and reverses downward door travel. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cord.

Photo-electric control: Provide each motorized door with a photo-electric device that will stop and reverse the downward door travel if the light beam is broken or blocked

Limit Switches: Provide adjustable switches, interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

Provide auxiliary chain hoist: for emergency manual operation while disconnecting motor, without affecting timing of limit switch. Mount disconnect and operator so they are accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

PART 3 - EXECUTION

3.01 PREPARATION

Take field dimension and examine conditions of substrates, supports and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Strictly comply with manufacturer's installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

B. Instruct Owners personnel in proper operating procedures and maintenance schedule.

C. Coordinate installation of electrical service. Complete all power & control wiring from disconnect to unit components.

3.03 ADJUSTING AND CLEANING

A. Test sectional doors for proper smooth operation and adjust as necessary to provide proper operation without binding or distortion & in full contact with weather-stripping.

A. Remove all temporary labels & visible markings.

C. Touch-up damaged coatings and finishes and repair minor damage. Clean doors, frames, glass, & all exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned.

3.04 WARRANTY

All equipment shall be free from defect for a period of two years & door sections shall not separate from other sections or rollers for a period of five years.

END

SECTION 08 35 13

FOLDING DOORS

PART 1 GENERAL

1.0a GENERAL CONDITIONS

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.0b SCOPE

The work included in this Section includes all materials and labor to install partitions in Areas shown on the Drawings. Include all items necessary for the completion of work whether or not they are shown in the documents, but are inferable as being necessary to provide the intended results.

1.0c BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids. Should the sub-contractor have questions or need clarifications, he shall notify the architect/architect at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.1 RELATED SECTIONS

- A. Section 05 10 00 - Structural Steel: Partition support members.
- B. Section 06 10 01 - Rough Carpentry: Partition support members.
- C. Section 08 71 00 - Door Hardware: Cylinder locks keyed to building keying system.
- D. Section 09 21 16 - Gypsum Board Assemblies: Acoustical closure above suspended ceilings.

1.2 REFERENCES

- A. ASTM C 423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- C. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- D. ASTM E 413 - Classification for Rating Sound Insulation.
- E. ASTM E 557 - Standard Practice for The Installation of Operable Partitions.
- F. FS CCC-W-408 - Wall Covering, Vinyl-Coated; Revision D.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions.
- C. Shop Drawings: Show layout, elevations, supports and anchorage, conditions at jambs and intersections with permanent walls, hardware, joints, and connections.
 - 1. Operators: Show location of operator, controls, and wiring diagrams.
- D. Selection Samples: For each partition finish specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each partition finish specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Test Reports: Certified test reports showing compliance with specified performance criteria.
- G. Certification: Signed by manufacturer certifying that products installed comply with Contract Documents.
- H. Operation and Maintenance Data: Include methods of operating, troubleshooting, and maintaining the specific partitions installed, with recommended methods of cleaning, especially finishes.

1.4 QUALITY ASSURANCE

- A. Field Measurements: Verify actual measurements of openings by field measurement prior to fabrication; show measurements on shop drawings.
- B. NRC Ratings: Substantiate by tests made in accordance with ASTM C 423.
- C. Installer Qualifications: Experienced in performing work of the type specified.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle and store products in accordance with manufacturer's recommendations.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Protect from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer.

1.6 WARRANTY

- A. Provide manufacturer's standard 1 year warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Panelfold, Inc., which is located at: 10700 N.W. 36th Ave. P. O. Box 680130; Miami, FL 33168-0130; Equal by Modernfold.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00.

2.2 OPERABLE PANEL PARTITIONS

- A. Partitions: Operable panel partitions, top supported with track, suspension carriers, and accessories; dimensions and layout as indicated on drawings
- B. PANELFOLD MODUFLEX SERIES 400 OPERABLE WALLS
- C. Operation: Manually operated flat panels, top supported with top and bottom seals as specified herein.
- D. Panel Configuration: Shall be as follows for areas indicated on drawings:
- E. Model 420: Comprised of panels hinged in pairs and center stacking. Final closure shall be effected by single expandable panels.
- F. Panel Finish: Panel Finish: Factory surfaced with one of the following (colors to be selected from manufacturer's standards by architect): Exposed metal trim & seal colors to be selected from manufacturer's standards by architect
- G. Manufacturer's "Woventex" panel fabric (20oz.per lineal yard), Class A, acrylic backed.
- H. Panels: Shall be 3" (76 mm) thick and nominally 49" (1245 mm) wide. Panel faces shall be laminated to metal frames. Panels shall have appropriate internal insulation to achieve specified STC. Tops of panels shall be reinforced to support suspension components. Vertical edges of panels shall not require trim, thus minimizing appearance of vertical joining of Sheer Look panels.
- I. Panel Hinges: Hinged with manufacturer's standard butt-type hinges.
- J. Panel Hanging Weight: Not to exceed 7.3 psf (39 kg/m²).
- K. Panel Acoustical Rating: Tested by an independent acoustical laboratory in accordance with ASTM E90-85 test procedures in a full scale 14' x 9' 3" (4 x 3 m) opening.
- L. STC Rating: STC 50
- M. Sound Seals: Shall be as follows:
- N. Model 420:
- O. Horizontal Top Seals: Continuous contact extruded vinyl shapes, clearance type, manually activated.
- P. Horizontal Bottom Seals: 1 1/2" (38 mm) clearance type, automatically actuated.
- Q. Downward pressure of clearance-type bottom seal mechanisms shall ensure an acoustical seal and resist panel movement.
- R. Suspension System: Shall be as follows:
- S. Manufacturer's heavy duty Type 7/8 aluminum track. Track shall be supported by adjustable steel hanger rods or by direct mount. Panels to be supported by trolley assemblies of radial-type steel, nylon tired or carbon fiber fill tired, steel ball bearing wheels. Trolleys shall be attached to panels having adjustable steel pendant bolts with locks to prevent panel misalignment.
- T. Flamespread: Class A flame spread rating to suit project requirements..

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and ASTM E 557.
- B. Provide the services of the manufacturer's field representative to advise on proper installation procedures and inspect the finished work.
- C. Install and adjust as required to achieve acoustical separation between adjacent areas.
- D. Adjust locking hardware for proper operation.
- E. Install operators and controls, make electrical connections and verify proper operation.
- F. Clean exposed surfaces after installation.
- G. Clean up work area and adjacent areas and dispose of debris legally off site.

3.4 DEMONSTRATION

- A. Demonstrate operation and instruct Owner's personnel in proper operation and maintenance procedures.
- B. Deliver keys and operation and maintenance data to Owner.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08 41 13 - ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Related sections include the following:
1. Section 07 92 00 "Joint Sealants" for joint sealants installed as part of aluminum entrance and storefront systems.
 2. Section 08 71 00 Door Hardware
 3. Section 08 80 00 "Glazing".

1.3 SUMMARY

- A. This Section includes all items required for the complete installation of the following:
1. Exterior storefront doors and fixed exterior storefront windows.
 2. Interior storefront doors and fixed interior storefront windows.
 3. Sub-sills, sill extensions, closures, trim, filler panels and other related storefront accessories.
- B. Design Intent: The Design Intent is to include all items required for the completion of work. Cross reference this Section with Hardware section 08 71 00 for any door hardware shown to be included by that section.

1.4 GENERAL

- A. General: Provide aluminum entrance and storefront systems capable of withstanding loads and thermal and structural movement requirements indicated, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.
1. Air infiltration and water penetration shall not exceed specified limits.
 2. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing units shall not exceed specified units.
- B. Glazing: Physically and thermally isolate glazing from all framing members.

1.5 PERFORMANCE

- A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
 2. Dimensional tolerances of building frame and other adjacent construction.
 3. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
 - d. Noise or vibration created by wind and by thermal and structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
 - f. Sealant failure.
 - g. Failure of operating units.
- B. Structural Loads: 25 pound per square foot.
- C. Deflection of Framing Members:
1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane shall not exceed L/175 of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.

2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components directly below them to less than 1/8 inch (3.2 mm) and clearance between members and operable units directly below them to less than 1/16 inch (1.5 mm).
- D. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E 330 as follows:
 1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 3. Test Durations: As required by design wind velocity, but not fewer than 10 seconds.
 - E. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 1.57 lbf/sq. ft. (75 Pa).
 - F. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
 - G. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
 - H. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 45 when tested according to AAMA 1503.
 - I. Sound Transmission: Provide aluminum-framed systems with fixed glazing and framing areas having the following sound-transmission characteristics:
 1. Sound Transmission Class (STC): Minimum 35 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
 2. Outdoor-Indoor transmission Class (OITC): Minimum 30 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.

1.6 SUBMITTALS

- A. Product Data: For each product specified. Provide details of construction relative to materials, dimensions of individual components, profiles, and finishes prepared by or under the supervision of supplier.
- B. Shop Drawings: For entrance and storefront systems. Show details of fabrication and installation, including plans, elevations, sections, details of components, provisions for expansion and contraction, and attachments to other work. For entrance systems, provide hardware schedule with operating hardware types, quantities, and locations. Indicate electrical, data wiring for access control hardware.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of entrance and storefront systems and are based on the specific systems indicated.
 1. The design, as judged solely by Architect for aesthetic effect shall not be changed, except with Architect's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.

- D. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.
- E. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- F. Sealant Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating that materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with sealants; include joint sealant manufacturers' written interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed to obtain adhesion.
- G. Product Test Reports: Based on evaluation of tests performed by manufacturer and witnessed by a qualified independent testing agency, indicate compliance of entrance and storefront systems with requirements based on comprehensive testing of current systems.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has specialized in installing entrance and storefront systems similar to those required for this Project and who is acceptable to manufacturer.
 - 1. Engineering Responsibility: Prepare data for entrance and storefront systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Source Limitations: Obtain each type of entrance and storefront system through one source from a single manufacturer.
- C. Installation Sealant Testing: Conduct sealant manufacturers' standard tests for compatibility and adhesion of sealants with each material that will come in contact with sealants and each condition required by system.
 - 1. Conduct tests under environmental conditions that duplicate those under which systems will be installed.
 - 2. For materials that fail tests, determine corrective measures required to prepare each material to ensure compatibility with and adhesion of sealants, including, but not limited to, specially formulated primers. After performing these corrective measures on the minimum number of samples required for each material, retest materials.
- D. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding Code-- Aluminum."
- E. Pre-Installation Meeting: Conduct a meeting between all associated trades including the "Access Control" sub-contractor and the "Smart Glass" sub-contractor. Discuss and document any necessary procedures as necessary for a complete functioning system.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating systems without field measurements. Communicate intensions with Job Superintendent who shall coordinate construction to ensure actual dimensions correspond to established dimensions.

1.9 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

- B. Manufacturer's Performance Warranty: Submit a written warranty executed by the manufacturer agreeing to repair or replace components of entrance and storefront systems that fail in materials or workmanship within 5 years from date of Substantial Completion. Failures include, but are not limited to, the following:
1. Structural failures including, but not limited to, excessive deflection.
 2. Adhesive sealant failures.
 3. Cohesive sealant failures.
 4. Failure of system to meet performance requirements.
 5. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 6. Failure of operating components to function normally.
 7. Water leakage through fixed glazing and frame areas.

1.10 BIDDING REQUIREMENTS:

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 – PRODUCTS

2.1 ALUMINUM ENTRANCE AND STOREFRONT SYSTEMS:

- A. Provide the following Exterior storefront systems in the locations indicated:
1. Kawneer Trifab Thermally broken 451T, center glazed, (2" x 4.5")
 2. Oldcastle FG3000 Thermally broken, center glazed, (2" x 4.5")
 3. Equal Product in compliance with the specifications by the following:
 - a. EFCO Corporation
 - b. Manko Corporation
 - c. United States Aluminum
 - d. Tubelite
 - e. Approved equal in accordance with Section 01 25 00.
- B. Provide the following Interior storefront systems in the locations indicated:
1. Kawneer Trifab 450, center glazed, (1 3/4" x 4.5")
 2. Vistawall FG3000, center glazed, (1 3/4" x 4.5")
 3. Equal Product in compliance with the specifications by the following:
 - a. EFCO Corporation
 - b. Manko Corporation
 - c. United States Aluminum
 - d. Tubelite
 - e. Approved equal in accordance with Section 01 25 00.
- C. Provide the following Exterior Entry Doors where indicated:
Vertical face dimension: 5" (127.0 mm)
Top Rail: 5" (127.0 mm)
Bottom Rail: 6-1/2" (165.1 mm)
1. Kawneer Model 500 Wide Stile Entry Doors with Paneline exiting hardware and offset pivots.
 2. Vistawall Model Wide Stile Entry Doors with door-o-matic concealed rod panic device and offset pivots.
 3. Equal Product in compliance with the specifications by the following:
 - a. EFCO Corporation
 - b. Manko Corporation
 - c. United States Aluminum
 - d. Prior approved equal in accordance with Section 01 25 00.

- D. Provide the following Interior Entry Doors where indicated:
 Vertical face dimension: 2-1/8" (54.0 mm)
 Top Rail: 2-1/4" (57.2 mm)
 Bottom Rail: 3-7/8" (98.4 mm)
1. Kawneer Model 190 Narrow Stile Entry Doors with Interior panic exiting hardware.
 2. Vistawall Model Narrow Stile Entry Doors with Interior panic exiting hardware.
 3. Equal Product in compliance with the specifications by the following:
 - a. EFCO Corporation
 - b. Manko Corporation
 - c. United States Aluminum
 - d. Prior approved equal in accordance with Section 01 25 00.
- C. Door Hardware:
 General Hardware Requirements:
- a. Provide manufacturer's standard hardware.
 - b. Hardware shall be fabricated from aluminum, stainless steel, or other corrosion-resistant material that is compatible with aluminum.
 - c. Hardware shall be designed to smoothly operate, tightly close, and securely lock aluminum-framed entrance doors.
- Door Hardware Required:
1. Top & bottom pivots for single acting operation. (additional intermediate pivot for 8' doors)
 2. Cont. geared aluminum hinges at all doors.
 2. Positive stop with automatic hold open.
 3. Falcon, or an approved equal, overhead surface mounted door closer.
 4. Keyed Locks.
 5. Bottom rail deadlocks in manufacturer's standard finish to match threshold.
 6. Interior exit hardware to be in compliance with ADA Architectural Guidelines and appropriate building codes for "free" exit.
- D. Standard Vertical offset pull & horizontal push bar shall be ADA compliant.
- E. Weather-Stripping:
- a. Meeting stiles on pairs of doors shall be equipped with an adjustable astragal using wool pile with polymeric fin.
 - b. The door weathering on a single-acting offset pivot or butt hung door and frame (single or pairs) shall be comprised of a thermoplastic elastomer weathering on a tubular shape with a semi-rigid polymeric backing.
- Sill Sweep Strips:
- c. EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners (necessary to meet specified performance tests)
- F. Thresholds shall be extruded aluminum meeting ADA Architectural Guidelines and building codes. Profile height shall not exceed 1/2 inch & must be ADA compliant. (One piece per door opening)
- G. Provide all components and accessories for complete systems in accordance with the manufacturer's written specifications for the aluminum entrance and storefront systems indicated.
- H. Provide insulated glazing in exterior doors as specified in Section 08 80 00 "Glazing."
- I. Provide Manufacturer's standard pressure-glazing system of black, resilient glazing gaskets, setting blocks, and shims or spacers, fabricated from an elastomer of type and in hardness recommended by system and gasket manufacturer to comply with system performance requirements. Provide gasket assemblies that have corners sealed with sealant recommended by gasket manufacturer.
- J. Provide spacers, setting blocks, gaskets and bond breakers using Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.

- 2.2 MANUFACTURERS FOR ALUMINUM SUNSHADE OUTRIGGER SYSTEM (**Under Alternate Bid**)
- A. Basis-of-Design Product: The design for aluminum sunshade outrigger systems is based on:
1. Kawneer versoleil sunshade outrigger system with round fascia, standard circular blades and 30" deep curved outriggers.
 2. Vistawall solar eclipse circular sunshades
 3. Manko curtainwall sun shades.
 4. Prior approved equal.
 5. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Receive architect's approval Prior to final installation of sunshades.

2.3 FRAMING SYSTEMS FOR ALUMINUM SUNSHADE OUTRIGGER SYSTEM (**Under Alternate Bid**)

- A. Sunshade Members: Manufacturer's standard extruded or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads. (Include all accessories, mountings, & shims. Sunshades shall be anchored directly to the vertical aluminum storefront mullions.)
- B. Obtain aluminum exterior sunshades and aluminum storefront system through one source from a single manufacturer. (Verify actual locations of structural supports for sunshades by field measurements before fabrication, indicate these measurements on shop drawings.)
- C. Fasteners and accessories: Nonmagnetic stainless steel to be non-corrosive and compatible with aluminum members, anchors, and other components.
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action. (Combined loads on sunshades to be determined in accordance with applicable code requirements, Combined load consists of wind, snow, and ice loads.)
- E. The assembled sunshade system shall be capable of supporting the specified combined load without damage, permanent deformation, or disengagement from the glazed system mullion. Blade deflection shall not exceed L/120 of span length.
- F. Fabricate components that, when assembled, have the following characteristics: Profiles that are sharp, straight, and free of defects or deformations Accurately fitted joints that are flush, hairline, and weatherproof Physical and thermal isolation of glazing from framing members Accommodations for thermal and mechanical movements of glazing and framing that maintain required glazing edge clearances Fasteners, anchors, and connection devices that are concealed from view to the greatest extent possible
- G. Thermal Barrier:
When applied on a thermally broken captured system, sunshade shall be thermally isolated from the aluminum mullions by a nominal 0.25" (6.3) thick low conductance material.
- H. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- I. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle sunshade materials and components to avoid damage. Protect sunshade materials against damage from elements, construction activities, and other hazards before, during and after installation.

2.4 FABRICATION

- A. Fabricate and clearly mark components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion, ready to receive concealed fasteners and anchor devices.

- B. Fabricate storefront framing in profiles indicated for flush glazing (without projecting stops). Provide sub- frames and reinforcing of types indicated or, if not indicated, as required for a complete system. Factory-assemble components to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.5 ALUMINUM FINISHES

- A. Kawneer Permanodic™ AA-M10C21A44 / AA-M45C22A44, AAMA 611, Black or Architectural Class I Color Anodic Coating. Standard finish as selected by architect from full range of standard anodized finishes.
- B. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- C. Finished Appearance: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of entrance and storefront systems. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 DELIVERY, STORAGE AND INSTALLATION

- A. General: Comply with manufacturer's written instructions for delivery, protecting, storing, handling and installing entrance and storefront systems. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints. Seal joints watertight.
- B. Metal Protection: Where aluminum would be in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum would directly contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Components shall be installed to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.
- D. Sill members and flashing shall be set in a full sealant bed to provide weather-tight construction, unless otherwise indicated. Comply with requirements of Division 7 Section "Joint Sealants."
- E. Framing components shall be installed plumb and true in alignment with established lines and grades without warp or rack of framing members.
- F. Entrances shall be installed plumb and true in alignment with established lines and grades without warp or rack. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible.
- G. Install glazing to comply with requirements of Division 8 Section "Glazing," unless otherwise indicated.
 - 1. Prepare surfaces that will contact structural sealant according to sealant manufacturer's written instructions to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
 - 2. Install structural silicone sealant according to sealant manufacturer's written instructions.
 - 3. Mechanically fasten glazing in place until structural sealant is cured.
 - 4. Remove excess sealant from component surfaces before sealant has cured.
- H. Install secondary-sealant weather-seal according to sealant manufacturer's written instructions to provide weatherproof joints. Install joint fillers behind sealant as recommended by sealant manufacturer.

- I. Install perimeter sealant to comply with requirements of Division 7 Section "Joint Sealants," unless otherwise indicated.
- J. Installation Tolerances: Install entrance and storefront systems to comply with the following maximum tolerances:
 - 1. Variation from Plane: Limit variation from plane or location shown to 1/8 inch in 12 feet; 1/4 inch over total length.
 - 2. Alignment: Where surfaces abutt in line, limit offset from true alignment to 1/16 inch. Where surfaces meet at corners, limit offset from true alignment to 1/32 inch.
 - 3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8.

3.3 FIELD QUALITY CONTROL

- A. Structural-Silicone-Sealant Adhesion Test: Test (minimum of 2 areas) installed structural silicone sealant according to field adhesion test method described in AAMA CW #13, "Structural Sealant Glazing Systems (A Design Guide)."
- B. Water Spray Test: After completing the installation of test areas indicated, test storefront system for water penetration according to AAMA 501.2 requirements. Submit test results to Architect.
- C. Repair or replace Work that does not meet requirements or that is damaged by testing. Replaced work shall conform to specified requirements.

3.4 ADJUSTING AND CLEANING

- A. Adjust doors and hardware to provide tight fit at contact points and weather stripping, smooth operation, and weather-tight closure. Adjust force of door closure for ADAAG requirements.
- B. Remove excess sealant, glazing compounds and dirt from all surfaces.

3.5 PROTECTION

- A. Provide final protection in a manner acceptable to manufacturer and Installer, to ensure entrance and storefront systems are without damage at the time of Substantial Completion.

END OF SECTION

SECTION 08 43 26 – ALL GLASS ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Related sections include the following:
1. Section 07 92 00 "Joint Sealants" for joint sealants installed as part of all glass entrance and storefront systems.
 2. Section 08 71 00 Door Hardware
 3. Section 08 80 00 "Glazing".

1.3 SUMMARY

- A. This Section includes all items required for the complete installation of the following:
1. Interior Pivot all glass doors and fixed all glass storefront.
 3. Sub-sills, sill extensions, closures, trim, filler panels and other related accessories.
- B. Design Intent: The Design Intent is to include all items required for the completion of work. Cross reference this Section with Hardware section 08 71 00 for any door hardware shown to be included by that section.

1.4 GENERAL

- A. General: Provide system capable of withstanding loads and structural movement requirements indicated, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.
1. Air infiltration and water penetration shall not exceed specified limits.
 2. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing units shall not exceed specified units.

1.5 PERFORMANCE

- A. General Performance: Window systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
- B. Structural Loads: 25 pound per square foot.
- C. Deflection of Framing Members:
1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane shall not exceed $L/175$ of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.
 2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components directly below them to less than 1/8 inch (3.2 mm) and clearance between members and operable units directly below them to less than 1/16 inch (1.5 mm).
- D. Sound Transmission: Provide aluminum-framed systems with fixed glazing and framing areas having the following sound-transmission characteristics:
1. Sound Transmission Class (STC): Minimum 35 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
 2. Outdoor-Indoor transmission Class (OITC): Minimum 30 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.

1.6 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for all-glass entrance and storefront system.
- B. Shop Drawings: For all-glass entrances.
 - 1. Include plans, elevations, and sections.
 - 2. Include details of fittings and glazing, including drawings of patch fittings and rail fittings.
 - 3. Door hardware locations, mounting heights, and installation requirements.
- C. Samples for Initial Selection: For each type of exposed finish indicated.
- D. Samples for Verification: For each type of exposed finish indicated, prepared on Samples of size indicated below.
 - 1. Metal Finishes: 6-inch- (150-mm-) long sections of patch fittings, rail fittings, accessory fittings, and other items.
 - 2. Glass: 6 inches (150 mm) square, showing exposed-edge finish.
 - 3. Door Hardware: For exposed door hardware of each type, in specified finish, full size.
- E. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, sidelights, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.
- F. Delegated-Design Submittal: For all-glass systems indicated to comply with performance requirements and design criteria.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has specialized in installing all glass entrance and storefront systems similar to those required for this Project and who is acceptable to manufacturer.
 - 1. Engineering Responsibility: Prepare data for entrance and all glass storefront systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
- B. Source Limitations: Obtain each type of entrance and all glass storefront system through one source from a single manufacturer.
- C. Pre-Installation Meeting: Conduct a meeting between all associated trades. Discuss and document any necessary procedures as necessary for a complete functioning system.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating systems without field measurements. Communicate intentions with Job Superintendent who shall coordinate construction to ensure actual dimensions correspond to established dimensions.

1.9 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Manufacturer's Performance Warranty:
Warranty: Installer agrees to repair or replace components of all-glass systems that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
Warranty Period: Two years from date of Substantial Completion except as follows:
Concealed Floor Closers: Two years from date of Substantial Completion.

1.10 BIDDING REQUIREMENTS:

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 – PRODUCTS

2.1 ALL GLASS ENTRANCE AND STOREFRONT SYSTEMS:

- A. Provide the following all glass systems in the locations indicated:
1. "Avanti systems" Solare acoustic single glazed partition system
 2. Equal Product in compliance with the specifications by the following:
 - a. Dorma USA Inc.
 - b. Old Castle Building Envelope
 - c. Raco interior solutions
 - d. Approved equal in accordance with Section 01 25 00.
- B. Provide the following Entry Doors where indicated:
1. "Avanti systems" Manual-Swinging, All-Glass Entrance Doors and Sidelights: Patch fittings at head and sill on pivot side, and for lock at sill of swing side.
 2. Equal Product in compliance with the specifications by the following:
 - a. Dorma USA Inc.
 - b. Old Castle Building Envelope
 - c. Raco interior solutions
 - d. Approved equal in accordance with Section 01 25 00.
- C. Door Hardware:
- General Hardware Requirements:
- a. Heavy-duty entrance door hardware units in sizes, quantities, and types recommended by manufacturer for all-glass entrance systems indicated. For exposed parts, match metal and finish of patch fittings and rail fittings.
 - b. Hardware shall be fabricated from aluminum, stainless steel, or other corrosion-resistant material that is compatible with aluminum.
 - c. Hardware shall be designed to smoothly operate, tightly close, and securely lock entrance doors.
- Door Hardware Required:
1. Top & bottom pivots for single acting operation. (additional intermediate pivot for 8' doors)
 2. Concealed Floor Closers: Center hung; BHMA A156.4, Grade 1; including cases, bottom arms, top walking beam pivots, plates, and accessories required for complete installation. (Set, seal, and grout floor closer cases as required to suit hardware and substrate indicated.)
 3. Keyed Locks.

- D. Standard Vertical offset pull & horizontal push bar shall be ADA compliant.
- E. Thresholds shall be extruded aluminum meeting ADA Architectural Guidelines and building codes. Profile height shall not exceed ½ inch & must be ADA compliant. (One piece per door opening)
- F. Patch Fittings: Material-Aluminum.
- G. Rail Fittings - Material: to Match patch-fitting metal and finish.
 - 2. Height:
 - a. Top Rail: As indicated.
 - b. Bottom Rail: As indicated.
 - c. Profile: Tapered or flat as indicated on drawings. Tapered at 60 degrees minimum from the horizontal.
 - d. End Caps: Manufacturer's standard precision-fit end caps for rail fittings.
- H. Accessory Fittings: Match patch- and rail-fitting metal and finish for the following:
 - 1. Overhead doorstop.
 - 2. Center-housing lock.
 - 3. Glass-support-fin brackets.
- I. Anchors and Fastenings: Concealed.
- J. Provide all components and accessories for complete systems in accordance with the manufacturer's written specifications for the all glass entrance and storefront systems indicated.
- K. Glass: ASTM C 1048, fully tempered, Condition A (uncoated surfaces), Type I (transparent), tested for surface and edge compression per ASTM C 1048 and for impact strength per 16 CFR 1201 for Category II materials.
 - 1. Class 1: Clear monolithic.
 - a. Thickness: 1/2 inch (13 mm).
 - b. Locations: As indicated.
 - 2. Exposed Edges: Machine ground and flat polished.
 - 3. Butt Edges: Flat ground.
 - 4. Corner Edges: Lap-joint corners with exposed edges polished.

2.2 FABRICATION

- A. Fabricate and clearly mark components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion, ready to receive concealed fasteners and anchor devices.

2.3 ALUMINUM FINISHES

- A. Architectural Class I Color Anodic Coating. Standard finish as selected by architect from full range of standard anodized finishes.
- B. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- C. Finished Appearance: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of all glass entrance and storefront systems. Do not proceed with installation until all unsatisfactory conditions have been corrected.

3.2 DELIVERY, STORAGE AND INSTALLATION

- A. General: Comply with manufacturer's written instructions for delivery, protecting, storing, handling and installing all glass window systems. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion.
Factory assemble all components and factory install hardware and fittings to greatest extent possible.
- B. Metal Protection: Where aluminum would be in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum would directly contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Framing components shall be installed plumb and true in alignment with established lines and grades without warp or rack of framing members. Maintain uniform clearances between adjacent components. Lubricate hardware and other moving parts according to manufacturer's written instructions. Set, seal, and grout floor closer cases as required to suit hardware and substrate indicated.

3.3 ADJUSTING AND CLEANING

- A. Adjust doors and hardware to provide tight fit at contact points and weather stripping, smooth operation, and weather-tight closure. Adjust force of door closure for ADAAG requirements. Adjust closers to provide a three-second closer sweep period for doors to move from a 70-degree open position to 3 inches (75 mm) from the latch measured to the leading door edge.
Accessible Interior Swinging Doors: Not more than 5 lbf (22.2 N) to fully open the door.
- B. Remove excess sealant, glazing compounds and dirt from all surfaces.

3.4 PROTECTION

- A. Provide final protection in a manner acceptable to manufacturer and Installer, to ensure all glass window systems are without damage at the time of Substantial Completion.

END OF SECTION

SECTION 08 46 00 - AUTOMATIC SLIDING DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SECTION INCLUDES

- A. Automatic sliding door System with operator and motion/presence sensor control device including all items required for completion of the work.

1.3 RELATED SECTIONS

- A. Section 08 41 13 "Aluminum-Framed Storefronts & Entrances".
- B. Section 08 70 00 "Door Hardware"
- C. Section 08 80 00 "Glazing".
- D. Division 26 - Electrical.

1.4 REFERENCES

- A. ANSI Z97.1 - Safety Glazing Material Used in Buildings.
- B. ANSI/BHMA 156.10 - Power Operated Pedestrian Doors.
- C. ANSI/UL 325 - Door, Drapery, Gate, Louver, and Window Operators and Systems.

1.5 SYSTEM DESCRIPTION

Include all items required for the completion of work. Therefore, all items necessary for the completion of work shall be required whether or not they are shown on the documents, but are inferable as being necessary to provide the intended results.

A. Doors Powered to Open Position:

1. Doors powered by DC electric motor and mechanical gear assembly transmitted to active leaves by fiberglass-reinforced tooth drive belt for silent operation. Doors using roller chain, cable, or hydraulic devices shall not be accepted.
2. Power door to open position by signals received by microprocessor from the actuation controls.
3. The last portion of the opening cycle shall be controlled by a microprocessor generated signal that electronically reduces voltage to motor until door is fully open. Door systems that use microswitches shall not be accepted.
4. To permit safe passage if an obstruction is detected between opening doors and surrounding walls or interior fittings, the doors shall immediately stop and after a delay go to the full closed position. Door systems that only monitor the door travel while closing shall not be acceptable.

B. Doors Powered to Closed Position:

1. The active leafs will only be powered to closed position when all actuating devices are cleared and after remaining in the open position for a preset time delay (per ANSI standards).
2. The last portion of the closing cycle shall be controlled by a microprocessor generated signal that electronically reduces voltage to the motor until door is fully closed.
3. To permit safe passage between closing doors, the doors immediately reverse to open position if an obstruction is detected, then resume their interrupted movement at low speed to check whether the obstruction has disappeared or not. Door systems that only monitor the door travel while opening shall not be acceptable.

C. Emergency Breakaway:

1. Full Breakout System: Interior sliding active leaves and sidelites swing out from any position in sliding mode.
2. Breakaway Pressure: Field adjustable to building code requirements and in accordance with ANSI/BHMA 156.10 maximum of 50 pounds.

D. Monitoring:

1. Microprocessor Software: Constantly monitor drive train system operations.
2. Control Circuit: Assume command of system and shut down automatic function by holding doors

open, should door speed, motor function, or drive train operations deviate from design criteria ranges.

3. Secondary Supervisory Circuit: Monitor main control circuit every 255 door cycles, ready to perform as a backup.

E. Energy Saving Device:

1. Switch: Recessed in interior header cover.
2. Door Opening Settings: Off, exit only, 2-way traffic, partial opening, and hold fully open.
3. Partial Opening Mode: Switch reduces total door opening to reduce conditioned air loss.
 - a. Microprocessor Programmed Intelligence: Door opening automatically resumes full-open position whenever traffic flow exceeds preset volumes.
 - b. Door returns to reduced opening mode when traffic subsides.
4. Heavy Weather Pile: Between doors and sidelites and between emergency breakaway hardware and door stiles.

1.6 PERFORMANCE REQUIREMENTS

A. General: Provide automatic entrance door systems that have the following capabilities based on testing manufacturer's standard units in assemblies similar to those indicated for this Project:

1. Thermal Movements: Provide automatic entrance doors that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - a. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces
2. Operating Temperature Range: Provide automatic entrance door operators capable of operating between minus 1 deg F and plus 120 deg F.
3. Structural Performance: Provide automatic entrance doors capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - a. Basic Wind Speed: As indicated in miles per hour (meters per second) at 33 feet (10 m) above grade. Determine wind loads and resulting design pressures applicable to Project according to the following, based on mean roof heights above grade as indicated on Drawings:
 - 1) Wind Loads: ASCE 7, "Minimum Design Loads for Buildings and Other Structures":
Section 6.4.2, "Analytic Procedure."
4. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 1.25 cfm/sq. ft. of door area when tested at an inward pressure differential of 1.57 lb/sq. ft. according to ASTM E283.
5. Opening Force: Maximum opening force of 5 lbf in accordance with Americans with Disabilities Act (ADA) and local codes. Not more than 50 lbf required to manually set door in motion of power fails, and not more than 15 lbf required to open door to minimum required width.

1.7 SUBMITTALS

- A. Comply with Section 01 33 00 - Submittal Procedures.
- B. Product Data: Submit manufacturer's product data, including description of materials, components, fabrication, finishes, and installation.
- C. Shop Drawings: Submit manufacturer's shop drawings, including elevations, sections, and details, indicating dimensions, materials, and fabrication of doors, frames, sidelites, operator, motion/presence sensor control device, anchors, hardware, finish, options, and accessories.
- D. Samples: Submit manufacturer's samples of aluminum finishes.
- E. Test Reports: Submit certified test reports from UL, CUL, and ICBO indicating doors comply with specified performance requirements.
- F. Manufacturer's Project References: Submit list of successfully completed projects including project name and location, name of architect, and type and quantity of doors manufactured.
- G. Manufacturer's Field Reports: Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA 156.10 after completion of installation.
- H. Operation and Maintenance Manual:
 1. Submit manufacturer's operation and maintenance manual.

- 2. Include spare parts list.
 - I. Warranty: Manufacturer's standard warranty shall be one year from date of installation.
- 1.8 QUALITY ASSURANCE
- A. Manufacturer's Qualifications:
 - 1. Continuously engaged in manufacturing of doors of similar type to that specified, with a minimum of 10 years successful experience.
 - 2. Member: American Association of Automatic Door Manufacturers (AAADM).
 - 3. Door, frame, operator, and sensor components from same manufacturer.
 - B. Installer's Qualifications:
 - 1. Minimum of 10 years successful experience in installation of similar doors.
 - 2. Local certified Besam distributor.
 - 3. Approved by manufacturer.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Delivery: Deliver materials to site protected from damage.
 - B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
 - C. Handling: Protect materials and finish from damage during handling and installation.
- 1.10 MAINTENANCE SERVICE
- A. Manufacturer shall provide factory-owned central-dispatch system for maintenance service.
 - B. The manufacturer shall maintain a company owned dispatch system that shall be available 24 hours per day, 365 days per year to insure proper service capability.
 - C. A manufacturer's employee, not an answering service, shall obtain malfunction information and dispatch appropriate service agency to project location.
- 1.11 BIDDING REQUIREMENTS:

Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@LandAIA.com.

PART 2 - PRODUCTS

- 2.1 ACCEPTABLE MANUFACTURERS
- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering standard steel doors and frames which may be incorporated in the work include:
 - 1. "Dura-Glide, Series 3000 - Single-Slide"; Stanley Access Technologies
 - a. Exterior: "Model 313834"
 - b. Interior: "Model 313834"
 - 2. "Series 2003 Belt Drive, Single-Slide"; Horton Automatics, Division of Overhead Door Corporation
 - a. Exterior: "Type 310, Model O-SX,SX-O"
 - b. Interior: "Type 310, Model O-SX,SX-O"
 - 3. "Unislide OHC Series Single-Slide, Besam An Assa Abloy Group Company
 - a. Exterior: "Unislide OC-S"
 - b. Interior: "Unislide OC-A" with Access Control Package
 - 4. Prior Approved Equal
- 2.2 AUTOMATIC SLIDING DOORS
- A. Model: Unislide automatic sliding doors.
 - 1. Aluminum doors and frames with sidelite and active door leaves.
 - 2. Overhead-concealed, electro-mechanical, microprocessor-controlled, sliding door operator.
 - 3. Operator housing, floor rollers, and door carriers.
 - B. Dimensions: See drawings.
- 2.3 ALUMINUM DOORS AND FRAMES
- A. Doors and Frames: Extruded aluminum, Alloy 6063-T5.

1. Hydraulic dampers (optional): provide 90 degree stop and cushion door upon opening and closing during emergency breakout conditions.
- B. Glass:
 1. Glazing Material: ANSI Z97.1.
 2. Active Leaves: 1-inch (25-mm) glass insulating units.
 3. Sidelites & Transom: 5/8" (15mm) glass insulated units fixed sidelite units only.
 4. Preglazed.
- C. Door Carriers:
 1. Roller Wheels: 2 steel roller wheels, 1-3/4-inch (44-mm) diameter, per active door leaf for operation over replaceable Delrin track. Single journal with sealed oil-impregnated bearings.
 2. 2 self-aligning anti-risers per leaf.
- D. Vertical Jambs: 1-3/4 inches (44 mm) by 4-1/2 inches (114 mm).
- E. Header:
 1. Span: Maximum 16'-0" (4,877 mm) without intermediate supports when using 1/4-inch glass.
 2. Size: 7-3/4 inches (187 mm) wide by 6-7/8 inches (175 mm) high.
 3. Hinge Point: Allows access for adjustments.
 4. Design: Closed header.
- F. Stiles: Wide – 5".
- G. Pivots: Top and bottom concealed pivots, extruded aluminum.
- H. Hardware: Breakaway.
- I. Exterior Glazing Stop Extrusion: Nonremovable, security-type glazing bead to prevent unauthorized entry.

2.4 SLIDING DOOR OPERATOR

- A. Operator:
 1. Overhead-concealed or surface-applied, electro-mechanical, microprocessor-controlled.
 2. Motor: High-efficiency, energy-efficient, DC motor.
 3. Mechanical drive assembly.
 4. Microprocessor System: Sets opening and closing speeds based on factory-adjusted configuration settings.
 5. Mechanical Limit Switches: Not acceptable.
 6. Adjustable Hold Open Time Delay: 0 to 60 seconds.
 7. Software: Incorporates self-diagnosing system.

2.5 AIR INFILTRATION Weatherstripping: All active door panel weatherstripping shall be concealed "finned-pile."

2.6 STRUCTURAL PERFORMANCE (WIND LOAD COMPLIANCE) AND FORCED ENTRY RESISTANCE

- A. Locking shall be independent 2 pt- locking system in each active leaf and include exterior key cylinder and interior thumb turn.
- B. Threshold shall be aluminum, 1/2" x 4 1/2" running full width of package. Lead-up: optional.

2.7 MOTION AND PRESENCE SENSOR CONTROL DEVICE

- A. Sliding Door Sensing System shall include the following:
 1. Uses planar K-band microwave technology to detect motion and focused active infrared technology to detect presence, in a single housing. The focused active infrared presence technology overlaps the motion pattern.
 2. The active infrared is comprised of 96 spots of detection made out of four rows of 24 spots of detection each (two rows on each side of the door). The focused presence technology never shuts off during closing cycle of the door.
 3. Self-monitoring (motion and presence sensor) and has the capability to make adjustments with a universal remote control.
 4. The self-monitored Wizard communicates with the Unislide through a monitoring connection. The self-monitoring connection allows the door to go into a failsafe mode in the event of a sensor failure.
 5. Operating temperature range of -30° F to 131° F.

- B. Switches and Sensor: Field installed and adjusted.
- 2.8 ELECTRICAL
- A. High-Efficiency DC Motor: Maximum of 3 A current draw. Allow for 5 operators to run on one 20 A line.
 - B. Power: Self-detecting line voltage capable control. 120 V through 240V, 50/60 Hz, 3 A incoming power with solid-earth ground connection for each door system. 5 door systems on one 20 A circuit.
 - C. Wiring: Separate channel raceway free from moving parts.
 - D. Brown out/high voltage capability: System has capability to operate at full performance well beyond brown out and high line voltage conditions (85V – 265V) sensing changes and adjusting automatically.
 - E. Convenience Battery: Shall be concealed in header and capable of full operation with blackout conditions, including sensor capabilities for typically 100 cycles.
- 2.9 ALUMINUM FINISHES
- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes
 - B. High-Performance Organic Finish: All doors within exterior walls, provide two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - C. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
 - E. Finished Appearance: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine and measure areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent utilization of doors. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Ensure openings to receive frames are plumb, level, square, and in tolerance.
- B. Ensure proper support has been provided at operator header.
- C. Ensure floor is level and smooth.

3.3 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and ANSI/BHMA 156.10.
- B. Install doors and beam plumb, level, square, true to line, and without warp or rack.
- C. Anchor frames securely in place.
- D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.
- E. Install exterior doors to be weathertight in closed position.
- F. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- G. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services:
 - 1. Manufacturer's representative shall provide technical assistance and guidance for installation of doors.
 - 2. Before placing doors in operation, AAADM certified technician shall inspect and approve doors for compliance with ANSI/BHMA 156.10. Certified technician shall be approved by manufacturer.

3.5 ADJUSTING

- A. Adjust doors for proper operation in accordance with manufacturer's instructions and ANSI/BHMA 156.10.
- B. Adjust motion sensors to the satisfaction of User Agency.

3.6 CLEANING

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that would damage glass or finish.

3.7 PROTECTION

- A. Protect installed doors and finish to ensure that, except for normal weathering, doors and finish will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.
- B. Related Sections include the following:
 - 1. Section "08 11 13" – "Hollow Metal Doors and Frames"
 - 2. Section "08 41 13" – "Aluminum Entrances & Storefront"
 - 3. Section "01 73 00" – Access Control Doors by Owner

1.2 SUMMARY

- A. This supplier shall furnish to the General Contractor all finishing hardware as hereinafter specified or as obviously required to complete this project. Items not specifically mentioned but necessary to complete the work shall be furnished, matching in quality and finish the items hereinafter specified or described.
- B. Design Intent: The Design Intent is for all doors to have hardware and to include all items required for the completion of work. Should a hardware type be omitted on the Drawing at a door opening, this supplier shall provide finish hardware equal to that specified for similar or adjacent openings and as approved by the Architect for function and quality. No extras will be allowed for omitted but required items for the functionality of the door. Clarify all questions with the Architect, in writing prior to the bid opening. Email Bill@Land3.com
- C. This Section includes the following:
 - 1. Commercial door hardware for the following:
 - a. Swinging doors.
 - b. Other doors to the extent indicated.
 - 2. Cylinders for doors specified in other Sections.
- D. Products furnished, but not installed, under this Section include the following. Coordinating, purchasing, delivering, and scheduling remain requirements of this Section.
 - 1. Cylinders for locks on aluminum and glass entrance doors/overhead doors.
- E. Items not included by this Section: Casework Hardware, Millwork Hardware & Toilet Accessories

1.3 COMPATIBILITY

- A. All door hardware shall comply with hardware and locking protocol specified herein.

1.4 SUBMITTALS

- A. Product Data: Include installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Details of electrified door hardware, indicating the following:
 - 1. Detail wiring diagram for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring. Include the following:
 - a. System schematic.
 - b. Door Number with swing direction.
 - c. Riser diagram.
 - d. Elevation of each door.
 - 2. Detail interface between electrified door hardware and security system.
- C. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of door hardware indicated.
- D. Full Size Samples: For exposed door hardware of each type indicated below, in specified finish, full size. Tag with full description for coordination with the Door Hardware Schedule. Submit samples before, or concurrent with, submission of the final Door Hardware Schedule as listed below:
 - 1. Hinges.
 - 2. Locks and latches.
 - 3. Bolts.
 - 4. Exit devices.
 - 5. Cylinders and keys.
 - 6. Operating trim.

7. Closers.
8. Stops and holders.
9. Door gasketing.
10. Thresholds.
11. Screws and fasteners.

NOTE: Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.

- E. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and typed format as shown below.
 - 1 - Single. Door # - (area location) (hand of door) (door size and material of door frame)
 List of items of hardware to be furnished for the above door:
 - 3 - Butt Hinges - type, size, and finish
 - 1 - Lockset - type, finish, keying
 - 1 - Door Closer - type, size, finish
 - 1 - Kick Plate - size, finish
 - 1 - Door Stop - type, finish
 - 3 - Door Mutes - type
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
 - a. Organize door hardware sets in same order as in the Door Hardware Schedule included in this Section.
 3. Information Required:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 4. Draft Schedule: Submit initial draft of final schedule along with essential Product Data to facilitate the fabrication of other work that is critical in the Project construction schedule. Submit the final Door Hardware Schedule after Samples, Product Data, coordination with Shop Drawings of other work, delivery schedules, and similar information has been completed and accepted.
 5. Final Schedule: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- F. Product Certificates: Signed by manufacturers of door hardware certifying that products furnished comply with requirements and that door hardware approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, indicating current products comply with requirements.
- I. Maintenance Data: For each type of door hardware to include in maintenance manuals specified in Division 1.
- J. Warranties: Special warranties specified in this Section.

1.5 SPECIAL KEYING REQUIREMENTS

- A. Confirm existing key system with owner prior to making keys.
 - 1. Only construction keys will be available to the Contractor during construction.
 - 2: Furnish the following keys:
 - 8 - Construction Master Keys (Temporary)
 - 2 - Grand Master Keys total
 - 3 - Master keys
 - 3 - Keys per lock or key set

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer having a minimum of 5-years experience in builders hardware field, competent to interpret plans, specifications and to furnish appropriate and complete. Include lists of completed projects with project names and addresses of architects and owners, and other information specified
- B. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a certified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
 - 1. Hardware shall be finished by those having a minimum of five (5) years experience in the builders hardware field. Competent to correctly interpret the Plans, Specifications and to furnish appropriate and complete hardware and to provide a competent builders hardware technician regularly employed by them to immediately service the job as required. This hardware technician shall be a registered Architectural Hardware Consultant (AHC), nationally registered with the Door and Hardware Institute (DHI) and his DHI identification number will be indicated on all documents presented by him/her.
 - 2. This supplier shall immediately service the job upon the call of the General Contractor and/or the Architect. Upon completion of the job and prior to the final construction inspection, this supplier shall lubricate and adjust all hardware according to the manufacturer's recommendations. These service requirements shall be demanded and strictly enforced by Architect.
- C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- D. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
- E. Regulatory Requirements: Comply with provisions of the following:
 - 1. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1, FED- STD-795, "Uniform Federal Accessibility Standards," as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - i. Interior Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - ii. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch (13 mm) high. Bevel raised thresholds with a slope of not more than 1:2.
 - 2. NFPA 101: Comply with the following for means of egress doors:
 - a. Latches, Locks, and Exit Devices: Not more than 15 lbf (67 N) to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Delayed-Egress Locks: Lock releases within 15 seconds after applying a force not more than 15 lbf (67 N) for not more than 3 seconds.
 - c. Door Closers: Not more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.
 - d. Thresholds: Not more than 1/2 inch (13 mm) high.

- G. Keying Conference: Contactor to conduct conferences at Project site with User Agency departments to comply with requirements in Division 1 Section "Project Meetings." Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
 - 1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2. Preliminary key system schematic diagram.
 - 3. Requirements for key control system.
 - 4. Address for delivery of keys.
- H. Pre-installation Conference: Conduct conferences at Project site with User Agency departments to comply with requirements in Division 1 Section "Project Meetings."
- I. Meetings with Owner: Include a minimum of 3 independent meetings at Project Site with Owner.
- J. Manufacturer, Supplier & Installer shall be available to meet with the Architect at the Project Site when requested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver keys to Owner in person, by registered mail or overnight package service.

1.8 COORDINATION

- A. Coordinate layout and installation of recessed pivots and closers with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."
- B. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.9 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Special Warranty: Written warranty, executed by manufacturer agreeing to repair or replace components of door hardware that fail in materials or workmanship within 2-years from Substantial Completion. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of operators and door hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
- C. Warranty Period for Manual Closers: 5-years from date of Substantial Completion.
- D. Warranty Period for Concealed Door Closers: 5-years from date of Substantial Completion.

1.10 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Maintenance Service: Beginning at Substantial Completion, provide six months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 - PRODUCTS

- 2.1 Finishes:
- A. All items of hardware to have Brushed/Satin Chrome (US26D) finish with the exception of the following:
 - 1. Door Closers and Brackets to have Sprayed Aluminum Finish.
 - 2. Panic Devices, Push, Pull, Kick plates & Armor plates to be Satin Stainless Steel (US32D).
 - B. Where stainless steel finish is called for, it is intended that the items of hardware be of stainless steel material, not aluminum or any other base material finished to match look of stainless steel finish.
- 2.2 Manufacturers and Products: See Hardware Schedule

PART 3 - EXECUTION

- 3.1 EXAMINATION
- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
 - B. Proceed with installation only after unsatisfactory conditions have been corrected.
- 3.2 PREPARATION
- A. Steel Doors and Frames: Comply with DHI A115 series.
 - 1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107.
 - B. Wood Doors: Comply with DHI A115-W series.
- 3.3 INSTALLATION
- A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
 - C. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- 3.4 FIELD QUALITY CONTROL
- A. Independent Architectural Hardware Consultant: Owner may engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
 - 1. Independent Architectural Hardware Consultant may inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.
- 3.5 ADJUSTING
- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 2. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
- B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:
1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
 2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
 3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

3.8 FINISH HARDWARE SCHEDULE

All hardware shall be satin chrome finish, ADA compliant with lever type handles and ADA approved thumb-turn.

All quantities and hands of doors listed are provided as a guide only. Contractor shall be responsible for providing all door hardware as shown on Plans. Contractor shall site verify all existing conditions prior to Bid.

Refer to Floor Plans and Hardware schedules on sheet A2.2 of architectural plans for a list of door hardware that is to be provided.

END OF SECTION

SECTION 08 80 00 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes all items for the completion of glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section including:
 - 1. Hollow Metal Doors Section 08 11 33
 - 2. Misc. Glazing where shown on the drawings.

1.3 PERFORMANCE REQUIREMENTS

- A. Include all items necessary for the completion of work whether or not they are shown in the documents, but are inferable as being necessary to provide the intended results.
- B. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- C. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
 - 1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:
 - a. Specified Design Wind Loads: Determine design wind loads applicable to Project from basic wind speed indicated in miles per hour (meters per second) at 33 feet (10 m) above grade, according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 6.4.2, "Analytic Procedure," based on mean roof heights above grade indicated on Drawings.
 - b. Maximum Lateral Deflection: For the following types of glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch (25 mm), whichever is less.
 - c. Minimum Glass Thickness for Exterior Lites: Not less than ¼ inch (6 mm).
- D. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- E. Fire-rated, Clear and Wireless Glazing Material – Provides protection by reducing the radiant and conductive heat transfer. Temperature Change (Range): 120 deg F ambient; 180 deg F, material surfaces.

1.4 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: For each type and color of glass and sealant indicated. 12-inch square Samples for glass and of 12-inch long Samples for sealants. Install sealant samples between two strips of material representative in color of the adjoining framing system.
- C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products

furnished comply with requirements.

- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- F. Pre-construction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.
- G. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).
- B. Installer Qualifications: An experienced installer who as completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Source Limitations for Glass: Obtain glass from one primary-glass manufacturer.
- D. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.
- E. Pre-construction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glass type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants.
 - 1. Use manufacturer's standard test methods to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
 - a. Perform tests under normal environmental conditions replicating those that will exist during installation.
 - 2. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 3. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
 - 4. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.
- F. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
 - 2. SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines."
 - 3. FGMA "Glazing Manual & Sealant Manual".
- G. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency:
 - 1. Insulating Glass Certification Council.
 - 2. Associated Laboratories, Inc.
 - 3. National Accreditation and Management Institute.
- H. Fire Resistance Rated Glass: Each lite shall bear permanent, non-removable label of UL certifying it for use in tested and rated fire resistive assemblies.:

- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
 - B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.
 - C. Deliver, store and handle fire resistance rated glass per manufacturer's written instructions.
- 1.7 PROJECT CONDITIONS
- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer, or below 40 deg F.
- 1.8 WARRANTY
- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
 - B. Manufacturer's Special Warranty on Insulating Glass: Written material and labor warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish install replacements for insulating-glass units that deteriorate as defined below F.O.B. to the Project site, within 10-years from date of Substantial Completion period indicated below.
 - 1. Definition of Deterioration of Glazing: Failure of the hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
- 1.9 BIDDER RESPONSIBILITY
- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

- 2.1 PRODUCTS AND MANUFACTURERS
- A. DEFINITIONS
 - 1. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.
 - 2. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
 - 3. All exterior glazing shall be meet energy code requirements of U-Factor 0.45 & SHGC 0.25

- B. Type 1: Insulating-Glass Units for Ext. Doors & Exterior Windows: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, & complying with ASTM E 774.
1. GL1 – Old Castle Glazing:
Outboard: 6mm (1/4") Guardian SunGuard® SNE 50/25 on CrystalGray® Radiant Low-E #2
AS: 1/2" (90% Argon / 10% Air)
Inboard: 6mm (1/4") Guardian Clear
 2. GL1 – Pilkington Glazing
Outboard: 6mm (1/4") Pilkington Solar E™ Plus on Grey Low-E #2
AS: 1/2" (90% Argon / 10% Air)
Inboard: 6mm (1/4") Pilkington Clear
 3. GL-1 – Approved equal with equal or greater performance as types 1. and 2.
- C. Type 2: Exterior Vinyl Windows: Factory Glazed, See Window Schedule & Window elev..
- D. Type 3: Interior Clear Tempered Glass:
1/4 inch thick minimum fully tempered uncoated, clear tempered. Ensure size of unit does not exceed 1/4" thickness limitations and ensure all safety glass meets all applicable codes. For glazing into Interior Frame units, coordinate with Interior Frame manufacturer to ensure appropriate glass thickness to fit into Interior Frame Units appropriately & securely to ensure no rattling will incur in these units when adjacent doors are opened or closed.
- E. Type 4: Fire Rated Glazing: ASTM C 1036 and ASTM C 1048; composed of clear laminated ceramic specially tempered glazing material. Thickness of glazing material: 5/16" min. as required for 45 min. rating. Approximate visible transmission: Varies with thickness (approximate range 88%). Logo: Each piece of fire-rated glazing shall be labeled with a permanent logo including name of Product, manufacture, testing laboratory (ul only), fire rating period, safety glazing standards, and date of manufacture. Performance: Glass must be rated to stop fire from either direction and must meet all testing requirements.

2.2 GLAZING SEALANTS & COMPONENTS

- A. General: Provide glazing sealants complying with the following requirements:
1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range for this characteristic.
- B. Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock strips, complying with ASTM C 542, black.

2.3 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Materials: Including, but not limited to, Cleaners, Primers, and Sealers, Setting Blocks, Spacers, Edge Blocks, Compressible Filler, and Glazing Sealant Backing.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep system.
 - 3. Minimum required face or edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- J. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 GLAZING

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weather-tight seal without developing bending stresses in glass.

Seal gasket joints with sealant recommended by gasket manufacturer.

- D. Install gaskets so they protrude past face of glazing stops.
- E. Comply with ASTM C 716 and gasket manufacturer's written instructions. Provide supplementary wet seal and weep system, unless otherwise indicated.

3.5 PROTECTION AND CLEANING

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Related Work:
 - 1. Section 06 10 00 "Rough Carpentry" for wood stud substrate.
 - 1. Section 07 21 00 "Thermal Insulation" for insulation and vapor retardants installed in gypsum board assemblies.
 - 2. Section 07 92 00 for "Joint Sealants".
 - 3. Section 07 84 00 "Firestopping".
 - 4. Section 09 30 00 "Ceramic Tile" for tile backer board installed for tile walls only where shown on plans.
 - 5. Section 09 90 00 "Paint"

1.3 SUMMARY

- A. Description: Provide all components as needed for a complete gypsum board assembly and as indicated on the Drawings and specified. This Section includes the following:
 - 1. Gypsum board & light gauge metal studs
 - 2. Rated wall, floor/ceiling and ceiling/roof assemblies per UL Listings.
- B. Include all items necessary for the completion of work whether or not they are shown in the documents, but are inferable as being necessary to provide the intended results.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's product specifications and installation recommendations for each type of product specified, for record purposes.
- B. Sample of each trim accessory indicated or required.
- C. Samples of textured finish on gypsum board substrate.

1.5 QUALITY ASSURANCE

- A. Reference Standards: Comply with applicable requirements of ASTM C 754 (Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard or Backing Board) and ASTM C 840 (Application and Finishing of Gypsum Board), both as supplemented by this Section.
- B. Definitions: Refer to ASTM C 11 for definitions of terms for gypsum board assemblies not defined in this section or other referenced sections.
- C. Fire-Resistance Ratings: For fire-rated assemblies, provide all drywall materials required and provide construction identical to assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board or from a manufacturer acceptable to gypsum board manufacturer.
- E. Mockup: Submit two (2) 12 inch sq. samples of selected gypsum board finish to painter for paint application.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.
- C. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.7 PROJECT CONDITIONS

- A. Environmental Conditions: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. Room Temperatures: Maintain not less than 40 deg F (4 deg C). For finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.

1.8 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

2.2 GYPSUM BOARD PRODUCTS

- A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize joints in each area and correspond with support system indicated.
 - 1. Thickness: Provide gypsum board in widths of 48 inches and thickness indicated or, if not otherwise indicated, in 5/8 inch thickness to comply with ASTM C840 for application system and support spacing indicated.
- B. Interior walls of new construction: 5/8" Type X firecode.
 - 1. Approved Products:
 - a. Tough Rock Fireguard " by Georgia Pacific Gypsum Corp.
 - b. Fire-Shield G, Gold Bond Building Products Div., National Gypsum Co.
 - c. Sheetrock Brand Gypsum Panels, Firecode Core, United States Gypsum
 - d. Other products equal to above by approved Manufacturers listed in article 2.1 A.
 - 2. ASTM C 36
 - 3. Core: 5/8 inch
 - 4. Long Edges: Tapered.
- C. Moisture/Mold Resistant Boards – to be installed on all bathroom walls, restroom walls, janitor closet, within 4 feet of kitchen sink and within 4 feet of drinking fountain.
 - 1. Water-Resistant Gypsum Face Board: ASTM C473, of type and thickness indicated below:
 - a. Type and Thickness: Regular, 1/2-inch thick, unless otherwise indicated.
 - b. Type and Thickness: Type X, 5/8 inch thick, where required for fire-resistance-rated assemblies and where adjacent thickness is 5/8" thick.
 - 2. Approved Products:
 - a. "Georgia Pacific Mold Guard".
 - b. "Gold Bond XP Mold & Moisture resistant
 - c. Other products equal to above by approved Manufacturers listed in article 2.1 A.
- D. Type "X" - Glass-Mat, Mold & Mildew Resistant Interior Wall Panel (Use at all rated Walls & intersections which may be exposed to moisture during construction before "blacked in").
 - 1. Approved Products: See UL Listings for approved manuf. and products.
 - a. "DensArmor Plus Fire Guard by Georgia Pacific Gypsum Corp
 - b. "GreenGlass Interior Fireguard gypsum Board" by Temple-Inland Forest Products
 - c. Other products equal to above by approved Manufacturers listed in article 2.1 A.
 - 2. ASTM C1177, enhanced mold & mildew resistant gypsum core wallboard. Conforming to the physical properties of ASTM C1396 and ASTM C1177 on Glass mat back. Rating of 10 "No Mold Growth" as tested for 4 weeks according to ASTM D3273.

- a. Surfaces to be Painted: Coated inorganic glass mat-faced back and paper-faced front.
- 3. Core: 5/8 inch, Type X
- 4. Long Edges: Tapered.

2.3 STEEL FRAMING FOR NON LOAD BEARING WALLS AND PARTITIONS

- A. General: Provide steel framing members complying with the following requirements:
 - 1. Component Sizes and Spacings: As indicated but not less than that required to comply with ASTM C 754 for maximum deflection of L/240 at 5 lbf per sq. ft. lateral loading.
 - 2. Protective Coating: Manufacturer's standard corrosion-resistant coating.
- B. Studs and Runners: ASTM C 645, 33 KSI, with flange edges of studs bent back 90 deg and doubled over to form 3/16-inch-wide minimum lip (return) and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
 - 1. 0.0312 inch (30 mil) thickness C Studs at 16" o.c. unless otherwise indicated (nominal 20 ga.) Equivalent Stud is acceptable using .0205 inch for 1 5/8", 2 1/2" & 3 5/8" and .0220 inch for 4" & 6". Use 1 1/2" 16 ga. snap-in channel bridging at mid point of the studs which are 10'-0" or less in height . Install bridging at 1/3 points where studs exceed 10'-0" in height.
 - 2. 0.0598 inch thickness CSJ Studs doubled at door jambs (nominal 16 ga.) extended & secured to above structure.
 - 3. Depth: As indicated.
 - 4. Top runner manufactured to allow partition heads to expand and contract with deflection of the structure.
 - 5. Use curved runners where needed for curved furr downs.
- C. Rigid Furring Channels: ASTM C 645, hat-shaped, 7/8 inch depth & 1 1/2" depth at 0.0312 (nominal 20 ga.) minimum thickness of base (uncoated) metal.
- D. Fasteners: Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.
- E. Special Solid Backing Support Plates: Where backing or blocking is needed and not shown as wood blocking, provide wall Backing plates designed to provide a solid backing support for handrails, wall-mounted shelving, base at exterior walls where there is no runner, flat screen monitors and similar equipment. ASTM A653/A653M structural steel, zinc coated of grade and coating as follows:
 - 1. Grade 50 (340), Class 1 or 2.
 - 2. Coating: G-60 steel
 - 3. Minimum Design Thickness of 0.0346 inch 33 mil. (20 gauge)
- F. Steel Framing Manufacturers: See article 2.1 A above.
- G. Deflection runners, tracks & clips: Top runner manufactured to allow partition heads to expand and contract with 1" deflection of the structure without damage to gypsum board. Use product as provided by metal stud manufacturer. See Top of Wall Details on plans.
- H. Firestop Deflection Tracks: Top runner manufactured to allow partition heads to expand and contract with 1" deflection of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Fire Trak Corp.; Fire Trak System attached to studs with Fire Trak Posi Klip.
 - b. Grace Construction Products; FlameSafe FlowTrak System.
 - c. Metal-Lite, Inc.; The System.
 - d. Steel Network Inc. (The); VertiTrack VTD Series.
 - e. Prior Approval in accordance with Section 01 25 00.

2.4 DRYWALL ACCESSORIES

- A. Typical Accessories: Provide corner beads, edge trim, and control joints complying with ASTM C1047 and requirements indicated below:
1. Material: Formed sheet steel or zinc, or metal combined with paper, with sheet steel coated with zinc by hot-dip or electrolytic processes, or with aluminum.
 2. Shapes as indicated by reference to designations in ASTM C 1047:
 - a. Cornerbead on outside corners, unless otherwise indicated.
 - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.
 - c. U-bead with exposed short flange used at exposed panel edges.
 - d. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening. (Locate at 24 foot maximum distance apart vertically on wall surfaces and above each door & window jamb in Project.)
 - e. 16 ga. Cold rolled channel used for bridging.
 - f. Utility angle 20 ga. Installed at corner conditions to provide support for board products.
 - g. Clip angles used to make attachments between framing members. Same gage as stud.
 - h. 1 ¼" Corner Beads for all outside corners, except where wall protection is shown.
 - j. 20 ga. Metal J, U & L trim to protect free edges of board.

2.5 JOINT TREATMENT MATERIALS

- A. General: Provide materials complying with ASTM C475, ASTM C840, and recommendations of manufacturer of both gypsum board and joint treatment materials for the application indicated.
- B. Joint Tape: 2-inch nominal width, paper reinforcing tape where gypsum wallboard is used. Fiberglass reinforced (paperless) tape where glass mat moisture and mold resistant wallboard is used.
- C. Joint Compound for Interior Gypsum Board
1. General: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats. Products shall not contain asbestos.
 2. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
 - a. Approved Products:
 - 1) "SHEETROCK Brand DURABOND Setting-Type Joint Compounds" by United States Gypsum Co.
 - 2) "SHEETROCK Brand Easy Sand Lightweight Setting-Type Joint Compounds" by United States Gypsum Co.
 - 3) "ToughRock Setting Compounds" by G-P Gypsum Corporation
 - 4) "ToughRock Sandable Setting Compounds" by G-P Gypsum Corporation
 - 5) "Lafarge Rapid Joint Lightweight Setting Compound" by Lafarge North America
 - 6) "ProForm Brand Sta-Smooth Joint Compound" by National Gypsum Company.
 - 7) "ProForm Brand Sta-Smooth Lite Joint Compound" by National Gypsum Company.
 - 8) Other products equal to above by approved Manufacturers listed in article 2.1 A.
 3. Drying Type Joint Compound: Vinyl type factory pre-mixed compound; formulated for uses indicated.
 - a. Approved Products:
 - 1) "SHEETROCK Brand All-Purpose Joint Compound" by United States Gypsum Co.
 - 2) "SHEETROCK Brand Plus 3 Lightweight All-Purpose Joint Compound" by United States Gypsum Co.
 - 3) "ToughRock Ready-Mix All-Purpose Joint Compound" by G-P Gypsum Corporation
 - 4) "ToughRock Lightweight Joint Compound" by G-P Gypsum Corporation
 - 5) "Lafarge Rapid Coat All Purpose Compound" by Lafarge North America Inc.
 - 6) "ProForm Brand All Purpose Joint Compound" by National Gypsum Company.
 - 7) "ProForm Lite Ready Mix Joint Compound" of National Gypsum Company.
 - 8) Other products equal to above by approved Manufacturers listed in article 2.1 A.
 4. Joint Compound for Paper Faced Gypsum Board:

- a. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - b. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type topping, or non-lightweight drying-type all purpose compound.
 - 1) Use setting-type compound for installing paper-faced metal trim accessories.
 - c. Fill Coat: For second coat, use setting-type, sandable topping or drying-type all purpose compound.
 - d. Finish Coat: For third coat, use setting-type, sandable topping or drying-type all purpose compound.
 - e. Skim Coat: For final coat of Level 4 finish, use setting-type, sandable topping or drying-type all purpose compound.
5. Joint Compound for Glass-Mat Faced Gypsum Board:
- a. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 - 1) For filling joints and treating galv. fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by the gypsum board manufacturer for this purpose.
 - 2) Apply water resistant tile adhesive to all cut or exposed edges, utility holes, and joints including those at wall intersections when installing moisture-resistant gypsum board panels.
 - b. Embedding and First Coat: For embedding tape and first coat on joints, galv. fasteners, and trim flanges, use setting-type taping compound.
 - 1) Use setting-type compound for installing paper-faced metal trim accessories.
 - c. Fill Coat: For second coat, use setting-type, sandable topping compound.
 - d. Finish Coat: For third coat, use setting-type, sandable topping compound.
 - e. Skim Coat: For final coat of Level 4 finish, use setting-type, sandable topping compound.
6. Provide spray-applied dual-purpose acrylic latex-based coating, in lieu of skim coat of joint compound for Level 4 gypsum board finish at the following locations:
- a. All Gypsum Board Ceilings
 - b. Glass-Mat, Mold & Mildew Resistant Interior Wall Ceiling Panels where glass mat facing is exposed.
 - c. Other locations as shown on the Drawings
7. Contractor's option to use this product at other areas requiring Level 4 gypsum board finish.

2.6 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum drywall construction which comply with referenced installation standards and the recommendations of the manufacturer of the gypsum board.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum boards to continuous substrates.
- C. Spot Grout: ASTM C475, setting-type joint compound of type recommended for spot grouting hollow metal door frames.
- D. Fastening Adhesive for Wood: ASTM C557.
- E. Steel drill screws complying with ASTM C1002 for the following applications:
 1. Fastening gypsum board to wood members.
 2. Fastening gypsum board to gypsum board.
 3. Length of screw shall be such that a minimum of 3 threads penetrates the metal.
- F. Water: All water used in joint system shall be clean and free from deleterious amounts of foreign material.
- G. Grommets for metal stud slots: Provide where air handler condensate drain tubing extends from air handler unit through metal studs to sewer line. Refer to mechanical drawings for walls that conceal tubing.

- H. Other Materials: All other materials not specifically described but required for a complete and proper installation of gypsum drywall shall be as selected by the Contractor, subject to approval by the Owner's representative.

2.7 DRYWALL SUSPENDED CEILING SYSTEM

1. Approved Products:

- a. Armstrong Drywall Flat Ceiling Suspension System with all components, channels, beams, wire, etc for complete framing system.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates with Installer present. Verify that installation conditions specified in Project Conditions article have been achieved and can be maintained.
- B. Related Work: Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing for installation tolerances and other conditions affecting installation and performance of gypsum board assemblies.
- C. Acceptance: Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Ceiling Anchorages: Coordinate ceiling suspension systems with overhead structural assemblies to ensure that provisions to receive ceiling hangers will develop their full strength and are at spacing required to support ceilings.

3.3 INSTALLING FRAMING, GENERAL

- A. Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.
- B. Supplemental Wood Framing: Before installing drywall, see that all supplementary framing, blocking, and bracing at terminations in gypsum board assemblies and to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction is installed. If not, alert General Contractor. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with "Gypsum Construction Handbook" published by United States Gypsum Co.

3.4 APPLYING AND FINISHING GYPSUM BOARD

- A. General Standards: Install and finish gypsum panels to comply with ASTM C 840 and gypsum board manufacturer's recommendations.
 - 1. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
 - 2. Locate either edge or end joints over supports. Position boards so that tapered edges abut tapered edges and mill-cut or field-cut ends abut mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends.
 - 3. Locate exposed end-butt joints as far from centers of walls and ceilings as possible, and stagger not less than 24 inches in alternate courses of board.
 - 4. Fit gypsum board neatly around ducts, pipes, conduits, and other penetrating items, and around openings for electrical devices, fixtures, accessories and similar recessed items.
 - 5. Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.
 - 6. Form control joints and expansion joints at locations indicated, with space between edges of boards, prepared to receive trim accessories.
 - 7. Where gypsum board intersects beams, joists, columns and other structural components, cut gypsum board to fit profile of component and allow 1/4 to 1/2 inch wide joint for sealant.
- B. Ceilings: Install ceiling boards across supports in the manner which minimizes the number of end-butt

joints, and which avoids end joints in the central area of each ceiling. Stagger end joints at least 24 inches.

- C. Walls and Partitions: Install wall/partition boards with 1/4-inch gap at floor and in manner which avoids end-butt joints entirely where possible.
 - 1. At walls more than 12 feet high, install boards horizontally with end joints staggered over studs.
 - 2. Stagger gypsum board joints over different studs on opposite faces of partitions.
 - 3. Cover both faces of partition framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls.
 - 4. Attach gypsum board to steel studs so that leading edge or end of each board is attached to open (unsupported) edge of stud flange first.
 - 5. Spot grout hollow metal door frames for solid core wood doors, hollow metal doors and doors over 32 inches wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panel into frames.
 - 6. Isolate perimeter of non-load-bearing partitions at structural abutments. Provide 1/4 inch to 1/2 inch space, and where exposed in the completed construction, trim edge with edge trim. Seal joints with acoustical sealant, except at fire-rated partitions joints shall be firestopped as specified in Section 07 84 00.

3.5 GYPSUM BOARD APPLICATION METHODS

- A. General: Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.
- B. Single-Layer Application: Install gypsum board as follows:
 - 1. On ceilings, apply gypsum board prior to wall/partition board application to the greatest extent possible and at right angles to supports, unless otherwise indicated. Provide lengths that will avoid or minimize end joints.
 - 2. On partitions/walls, apply gypsum board horizontally (perpendicular to supports), unless parallel application is required for fire-resistive-rated assemblies. Use maximum-length panels to avoid or minimize end joints. Stagger joints on opposite sides of partitions.
 - 3. On furring members, apply gypsum board vertically (parallel to supports) with no end joints. Locate edge joints over furring members.
- C. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:
 - 1. Fasten to steel framing with screws.
 - 2. Fasten to wood supports with screws or double nailing.
- D. Sound Attenuation: Install insulation after framing is complete and piping, conduits, ducts and other penetrating items are complete and tested. Install insulation to form a continuous sound barrier the full height and width of the partition.
- E. Where STC-rated gypsum board assemblies are indicated, seal construction at perimeters, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions. Comply with ASTM C919 and manufacturer's recommendations for location of edge trim and close off sound-flanking paths around or through construction, including sealing of partitions above acoustical ceilings.

3.6 INSTALLING TRIM ACCESSORIES

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners. Provide trim as follows.
 - 1. Install corner beads at all external corners.
 - 2. Install edge trim where edge of gypsum panels would otherwise be exposed and where gypsum panels are tightly abutted to other construction. Provide edge trim type with face flange formed to receive joint compound except where other types are indicated.
 - 3. Install aluminum edge trim and other accessories where indicated.
- B. Form control joints and expansion joints at locations indicated, with space between edges of boards, prepared to receive trim accessories. If not shown on Drawings, control joints shall be installed as follows:

1. A control joint shall be installed above each jamb of all doors in gypsum board wall and where a partition, wall, or ceiling traverses a construction joint (expansion or building control element) in the base building structure.
2. Control joints shall be installed where a wall or partition runs in an uninterrupted straight plane exceeding 24 linear feet.
3. Control joints in interior ceilings with perimeter relief shall be installed so that linear dimensions between control joints do not exceed 50 feet and total area between control joints does not exceed 2500 sq. ft.
4. Control joints in interior ceilings without perimeter relief shall be installed so that linear dimensions between control joints do not exceed 30 feet and total area between control joints does not exceed 900 sq. ft.
5. A control joint or intermediate blocking shall be installed where ceiling framing members change direction.

3.7 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Treat gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads and surface defects; and elsewhere as required to prepare gypsum board surfaces for decoration and levels of gypsum board finish indicated.
 1. Pre-fill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
 2. Apply joint tape over gypsum board joints and to face flanges of aluminum and other trim accessories as recommended by trim accessory manufacturer to prevent cracks from developing in joint compound at flange edges.
- B. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
 1. Level 1 for HVAC closet areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistive-rated assemblies and sound-rated assemblies.
 2. Level 4 for gypsum board surfaces indicated to receive light-textured finishes including all painted walls and walls exposed.
- C. Level 1 Finish: Where level 1 gypsum board finish is indicated, apply joint compound specified for embedding coat.
- D. Level 4 Finish: For level 4 gypsum board finish, embed tape in finishing compound plus two separate coats applied over joints, angles, fastener heads, and trim accessories using the following joint compounds (not including prefill), and sand between coats and after last coat:
 1. Embedding and First Coat: Ready-mixed, drying-type, all-purpose or taping compound.
 2. Fill (Second) Coat: Ready-mixed, drying-type, all-purpose or topping compound.
 3. Finish (Third) Coat: Ready-mixed, drying-type, all-purpose or topping compound.

3.8 FIRE WALLS

- A. General: Install gypsum board fire wall assemblies to comply with requirements of fire-resistance-rated assemblies UL –U465 as indicated on plan, manufacturer's written installation instructions, and ASTM C 754 other than stud-spacing requirements
- B. .
- C. Install supplementary framing in gypsum board fire wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by fire wall assembly framing.
- D. Penetrations: At penetrations in fire wall, maintain fire-resistance rating of fire wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.
- E. Sound-Rated Fire Wall Assemblies: Seal all gypsum board fire walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly.
- F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

3.9 INSTALLATION – WALL TILE SUBSTRATE

- A. Wall Tile Substrates: For substrates indicated to receive thin-set ceramic tile and similar rigid applied wall finishes, comply with the following:
 - 1. Install water-resistant Tile-Backer Board panels at all areas to receive tile.
 - 2. Tile Backing Panels:
 - a. Restroom & wet wall areas not subject to wetting: Install Mold & Mildew Resistant Interior Wall Panel to produce a flat surface except at locations to receive water-resistant backing panels.
 - b. Where tile backing panels abut other types of panels in the same plane, shim surface to produce a uniform plane across panel surfaces.

3.12 REGULATORY AGENCY REVIEW OF RATED WALLS

- A. Schedule a meeting with the Fire Marshal and local Building Inspector and other Regulatory Review Agency personnel to inspect rated wall assemblies.
- B. Make corrections as necessary.
- C. Submit written inspection reports to Architect.

3.13 CLEANING AND PROTECTION

- A. Cleaning: Promptly remove any residual joint compound from adjacent surfaces.
- B. Protection: Provide final protection and maintain conditions that ensures gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 09 97 23

Waterproof Coating

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Application of water-based, high-build, 100 percent acrylic, waterproof coating.
2. Scope: Limited to East Wall above lower roof shown on Roof Plan.

1.2 SUBMITTALS

- ###### A. Comply with Section 01 33 00]

1.3 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications: Company with minimum 15 years of experience in manufacturing of specified products.
2. Manufacturer Qualifications: Company shall be ISO 9001:2000 Certified.
3. Applicator Qualifications: Company with minimum of 5 years' experience in application of specified products on projects of similar size and scope and is acceptable to product manufacturer.
 - a. Successful completion of a minimum of 5 projects of similar size and complexity to specified work.

B. Field Sample:

1. Install at project site or another pre-selected area of the building, minimum 4 feet by 4 feet (1.2 m by 1.2 m), using specified material.
2. Apply material in accordance with manufacturer's written application instructions.
3. Manufacturer's representative or designated representative will review technical aspects; surface preparation, repair and workmanship.
4. Field sample will be standard for judging workmanship on remainder of project.
5. Maintain field sample during construction for workmanship comparison.
6. Do not alter, move, or destroy field sample until work is completed and approved by architect/engineer.
7. Obtain architect/engineer written approval of field sample before start of material application, including approval of aesthetics, color, texture and appearance.
8. Perform adhesion test in accordance with ASTM D3359, Method A. Minimum adhesion rating of 4A required on 0 to 5 scale.

1.4 DELIVERY, STORAGE, AND HANDLING

- ###### A. Comply with Section 01 60 00]

1.5 PROJECT CONDITIONS

A. Environmental Requirements:

1. Do not apply material when substrate or ambient temperature is 40 degrees F (4 degrees C) or below or is expected to fall below 40 degrees F (4 degrees C) within 24 hours after application.
2. Do not apply material if rain is expected within 24 hours of application.
3. Do not apply over moving cracks, control joints, or expansion joints.
4. Do not apply to horizontal traffic-bearing surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS EQUAL TO:

Master Builders Solutions
889 Valley Park Drive
Shakopee, MN 55379 USA
Customer Service: 800-433-9517
Technical Service: 800-243-6739
Direct Phone: 952-496-6000
Website: www.master-builders-solutions.com/en-us

A. Substitutions: Comply with Section 01 25 00.

- #### B. Specifications and drawings are based on manufacturer's proprietary literature from Master Builders Solutions. Other manufacturers shall comply with minimum levels of material, color selection, and detailing indicated in specifications or on drawings. Architect/engineer will be sole judge of appropriateness of substitutions.

2.2 MATERIALS

A. Water-based, high-build, 100 percent acrylic, waterproof coating.

1. Acceptable Product: MasterProtect HB 400 (Formerly Thorocoat) by Master Builders Solutions.

B. MasterProtect HB 400 Fine:

1. Density, ASTM D1475: 13.1 to 14.1 lbs per gal (1.57 to 1.69 kg/L).
2. Solids Content, ASTM D5201:
 - a. By Weight: 66.6 – 71.2 percent.
 - b. By Volume: 48.0 – 50.0 percent.
3. Viscosity, ASTM D562: 117 to 125 KU.
4. VOC Content, ASTM D3960: 0.60 lbs per gal (72 g/L), less water and exempt solvents.

C. Approximate Coverage Rate: 75 to 100 sq ft per gal (1.84 to 2.46 m²/L).

D. Wet Film Thickness (WFT):

1. Smooth: 16 to 22 mils (406 to 559 microns).
2. Fine: 16 to 22 mils (406 to 559 microns).
3. Coarse: 16 to 22 mils (406 to 559 microns).

E. Dry Film Thickness (DFT):

1. Smooth: 6 to 8 mils (152 to 203 microns).
2. Fine: 8 to 11 mils (203 to 279 microns).
3. Coarse: 8 to 11 mils (203 to 279 microns).

F. Colors: white

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Site verify existing conditions and materials.

3.2 SURFACE PREPARATION

- A. Protection: Protect adjacent work areas and finish surfaces from damage during coating application.
- B. Prepare surfaces in accordance with manufacturer's instructions.
- C. Ensure that substrate is sound, clean, dry, and free of dust, dirt, oils, grease, laitance, efflorescence, mildew, fungus, biological residues, and other contaminants that could prevent proper adhesion.
- D. Ensure concrete substrates have a minimum 28-day cure and are free of bond-inhibiting contaminants.
- E. Clean surface to achieve texture similar to medium-grit sandpaper.
- F. Repair holes and spalled and damaged concrete with repair materials approved by coating manufacturer.
- G. Remove protruding concrete accessories and smooth out irregularities.
- H. When chemical cleaners are used, neutralize compounds and fully rinse surface with clean water. Allow surface to dry before proceeding.
- I. Remove blisters or delaminated areas and sand edges to smooth rough areas and provide transition to existing paint areas.
- J. Check adhesion of existing paint in accordance with ASTM D3359, measuring adhesion by Tape Method A.
- K. Treat cracks greater than 1/32 inch (0.8 mm) with knife-grade or brush-grade patching compound.
- L. Treat cracks greater than 1/4 inch (6 mm) as expansion joints and fill with sealant approved by coating manufacturer.
- M. Prepare and treat cracks in accordance with manufacturer's instructions.

3.3 PRIMING

Apply primer in accordance with manufacturer's instructions.

Use primer approved by coating manufacturer.

3.4 MIXING

- A. Mix coating in accordance with manufacturer's instructions to ensure uniform color and aggregate disbursement and to minimize air entrapment.
- B. In multi-pail applications, mix contents of each new pail into partially used pail to ensure color consistency and smooth transitions from pail to pail.

3.5 APPLICATION

- A. Apply coating in accordance with manufacturer's instructions.
- B. Apply coating as a two-coat system.

- C. Maintain proper uniform wet-film thickness during application to ensure performance characteristics desired.
- D. Apply coating using consistent application techniques to achieve uniform color and texture.

3.6 PROTECTION

- A. Protect applied coating from damage during construction.

END OF SECTION

SECTION 09 30 13 - TILING
(Ceramic & Porcelain)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY:

- A. This Section includes all labor & materials as needed for complete installation of Tile floor including all accessories and products for a smooth transition to adjacent flooring. (See Plans for Schedules & Locations)
- B. Limited existing flooring has been removed by Asbestos Abatement Contractor outside of this contract.
- C. Provide leveling agent and filler patch on all floors as needed for leveling prior to new flooring installation.
- D. **FULL VISUAL INSPECTION REQUIRED PRIOR TO BIDS** - Contractor shall be responsible for visually inspecting all existing floor areas scheduled to receive new flooring prior to bid date and include in bid the cost of all preparatory work for a uniform looking, top quality flooring installation, including all floor leveling materials and crack suppression membranes over all large cracks, control joints and expansion joints
- E. Porcelain tile where scheduled.
- F. Crack suppression & waterproof membrane.
- G. Sealing the tile floor joints.

1.3 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.4 QUALITY ASSURANCE

- A. Single Source: Provide materials obtained from one source for each type and color of tile, grout, and setting materials.
- B. Installation shall be in accordance with Tile Council of America Handbook for Ceramic Tile Installation.
- C. Mockup: Submit the following:
 - 1. Samples for each type of tile and for each color and texture required, not less than 4' x 4' square, on concrete slab, grouted, and sealed for Architects approval prior to ordering material.
 - 2. Full size samples for each type of trim, accessory and for each color.
 - 3. Samples of metal edge strip & flooring transition.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information and installation instructions for materials required, except bulk materials.
- B. Shop Drawings: Submit dimensioned shop drawings with indicated patterns and locations and widths of control, contraction and expansion joints in tile surfaces.
- C. Samples for Initial Selection Purposes: Submit manufacturer's color charts consisting of actual tiles or sections of tile showing full range of colors, textures and patterns available for each type of tile indicated. Include samples of grout and accessories involving color selection.
- D. Submit Resume of Water jetting company with Shop Drawings with evidence of 5 years of architectural experience.
Provide the following with the Shop Drawings indicating:
 - 1. Design
 - 2. Color Specifications
 - 3. Tolerance
 - 4. Revisions to line integrity
 - 5. Area for approval signature and date
 - 6. Installation map to include telephone number of the waterjet company.
 - 7. Installation map to include these sentences.

1.6 PERFORMANCE REQUIREMENTS

- A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with a minimum of 0.42 DCOF, as measured by the DCOF AcuTest. This means that tiles suitable for level interior spaces expected to be walked upon when wet should have a DCOF value of 0.42 or greater. Product may require periodic deep cleaning or traction-enhancing maintenance to maintain DCOF values.

1.7 PRODUCT HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Prevent damage or contamination to materials by water, freezing, foreign matter or other causes.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions and protect work during and after installation to comply with referenced standards and manufacturer's printed recommendations.
- B. Maintain temperatures at 50°F (10°C) or more in tiled areas during installation and for 7 days after completion, unless higher temperatures required by referenced installation standard or manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Standard for Tile Installation Materials: Comply with ANSI standard referenced with installation, products, and materials indicated. Furnish tile complying with "Standard Grade" requirements unless otherwise indicated.
- B. Colors, Textures and Patterns: For tile and other products requiring selection of colors, surface textures or other appearance characteristics, provide products to match characteristics indicated or, if not otherwise indicated, as selected by Architect from manufacturer's full selection.
- C. Factory Blending: For tile exhibiting color variations within the ranges selected during sample submittals, blend tile in factory and package accordingly so that tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.

2.2 TILE PRODUCTS:

- A. Manufacturers - Subject to compliance with the requirements, provide product specified from one of the following manufacturers.
1. American Olean Tile Company.
 2. Dal-Tile Corporation.
 3. Crossville
 4. Equal per Section 01 25 00

2.3 TILE PRODUCTS SCHEDULE

Flooring – Equal to Dal Tile 12" x 24" Color Body Stone Attache Series

Wall – Equal to Dal Tile 12" x 24" Volume 1 Glazed Porcelain

- A. Tile products as shown on Plan Sheets.
- B. Trim Units: Provide tile trim units to match characteristics of adjoining flat tile and to comply with following requirements:
1. Size: As indicated, coordinated with sizes and coursing of adjoining flat tile where applicable.
 2. Shapes: As selected from manufacturer's standard shapes. Use ceramic coves at all bases and bullnose at all exposed edges of wainscots.

2.4 WATERPROOFING /CRACK SUPPRESSION MEMBRANE

1. Liquid Membrane required under all tile floors and behind all wet walls to receive tile, applied with fiberglass mesh if needed to eliminate the telegraphing of colds joints in concrete.
 - a. "Laticrete Hydro Ban"; Laticrete International Inc.

- b. "Aqua Defensen"; Mapei Corp.
- c. Approved Equal.

- B. General: Product that complies with ANSI A118.12 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
- C. Provide self-bonding elastomeric membrane capable of heavy-duty service per ASTM C627.
- D. Primer: As required by the membrane manufacturer.
- E. Furnish in 12 inch and 36 inch wide sheets in lengths required for full coverage under all ceramic or porcelain.

2.5 LEVELING COMPOUND

- A. Leveling coat shall be 1/4" thick or less and shall consist of one of the following products:
Product for minor floor leveling as follows:
 - 1. Mapei Plani Patch
 - 2. Ardex Feather-Finish
 - 3. Approved Equal
 Product for major floor leveling as follows:
 - 1. Mapei M-20 Self-Level
 - 2. Ardex K-15 Self-Level
 - 3. Approved Equal
- B. Maximum variation in surface of leveling coat shall not exceed 1/8" in 8'-0" from required plane.
- C. Leveling coat shall be cured at least 24 hours before tile is applied.

2.6 MORTAR/GROUT MATERIALS: FLOOR & WALL TILE

- A. Floor Tile Bond Coat: Thin Set Mortar with Polymer or Acrylic/Latex Additive.
- B. Wall Tile Mastic Type Adhesive: High strength latex-based, non-flammable adhesive formulated to meet or exceed the requirements of ANSI A136.1, Type 1 and ISO 13007 D2TE.
- C. Latex Portland Cement Grout consisting of mortar with an acrylic latex or polymer additive. Use in conformance with ANSI A108.5 and ANSI A108.10. Materials shall conform to ANSI A118.3 and ANSI A118.7. **Color to be selected from manufacturer's full range of colors.**
- D. Approved Manufacturers & Products:
 - 1. Laticrete International Inc.
 - a. Floor Tile < use Laticrete 254 Platinum Multipurpose. Thinset Mortar Floor Tile > use Laticrete 255 Multi-Max.
 - b. Wall Tile < use Laticrete 15 Premium.
 - c. Grout: Laticrete Premium Grout.
 - 2. Mapei Corp.
 - a. Floor Tile < use Ultraflex 3 Floor Tile > use Ultraflex LFT
 - b. Wall Tile < use Type 1 Mastic Wall Tile > use Ultraflex LFT
 - c. Floor & Wall Grout: Mapei "Keracolor"
 - 3. Equal Products by the following manufacturers:
 - a. Custom Building Products
 - b. TEC Specialty Construction Brands
 - c. Approved Equal

2.7 ACCESSORY MATERIALS

- A. Transition Thresholds: Uniform in color and finish, fabricated to produce transition from tile surfaces to adjoining surfaces and to be not more than 1/2 inch above an adjacent floor finish with transition edges beveled on a slope of not greater than 1:2.
 - 1. Material: Aluminum, complying with minimum abrasive hardness value of 10 per ASTM C 241.
 - 2. Color and Finish: As selected from manufacturer's full range.
- B. Elastomeric Sealants: ASTM C 920.
 - 1. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with the requirements of section 07 90 00 "Joint Sealants" including ASTM C 920 as referenced by Type, Grade, Class, and Uses.
 - 2. Colors: Provide colors of exposed sealants to match colors of grout in the tile adjoining sealed joints

unless otherwise indicated.

- C. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement based formulation approved by manufacturer of tile setting materials.
- D. Aluminum Edge Trim: Schluter Trim anchored to underlayment where shown on plans.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Installation Methods: Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA designations indicated.
- B. Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" applicable to installation methods and setting and grouting materials indicated.
- C. Verify that substrates for setting tile are firm; dry; clean; free from oil, waxy films, and curing compounds; and within flatness tolerances required by ANSI A108 Series tile installation standards for installations indicated. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Apply trowelable leveling and patching compounds to fill cracks, holes, and depressions in substrates. Where indicated on Plans floor tile for ceramic tile and porcelain shall be set in a full mortar bed and sloped to floor drains. Provide shrinkage mesh in mortar bed with waterproof membrane. Fill joints with grout as indicated on Drawings. **Joints shall be right/small with smooth transition between tiles.** Provide cove mold at all corners of floor to wall transitions.
- E. Allowable Substrate Tolerances:
 - 1. Thin set method:
 - a. Maximum variation in substrate surface: 1/8 inch in 8 feet.
 - b. Maximum height of abrupt irregularities: 1/32 inch.
- F. Subfloors that have cracks, ridges, depressions, scale, and foreign deposits of any kind shall be properly leveled & prepared by sanding or grinding. Install crack isolation membrane over all cold joints in existing concrete topping over concrete pan joist. Install floor leveling compound as needed and as recommended by manufacturer. Verify Quantities of materials needed Prior to Bids.
- G. Waterproofing: Install to produce a waterproof membrane of uniform thickness that is securely bonded to substrate. Do not install tile over waterproofing until waterproofing has cured and has passed testing to determine that it is watertight.
- H. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile, unless otherwise indicated.
- I. Field-Applied Temporary Protective Tile Coating: Apply a continuous film to protect tile surfaces from adhesion of grout.
- J. Solid Backing: Produce 100 percent mortar coverage on tile backs to comply with applicable special requirements for back buttering in ANSI A108 Series tile installation standards in the following locations:
 - 1. Floors installed with chemical-resistant mortars and grouts.
 - 2. Floors composed of 8-by-8-inch tile or larger.
 - 3. Floors composed of rib-backed tiles.
- K. Blending: For tile with color variations, install blended tiles to produce color variations that match approved Samples.
- L. Extend tile work into recesses and under or behind equipment and fixtures to produce a complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- M. Accurately form intersections and returns. Cut and drill tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items to produce straight aligned joints. Fit tile to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- N. Jointing Pattern: Align joints when adjoining tiles on floor, base, walls, and trim are the same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths.
 - 1. Lay tile in grid pattern.

- O. Joint Widths: Produce uniform joint widths as follows:
 - 1. Floor Tile:
 - a. Ceramic Tile: 1/8 inch
 - b. Porcelain Tile: 1/8 inch
 - 2. Wall Tile: 1/8 inch. Larger joints may be needed and acceptable, verify with Architect.
- P. Expansion Joints: Form expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
 - 1. Locate joints in tile surfaces directly above joints in concrete substrates.
 - 2. Prepare joints and apply sealants to comply with requirements of Division 7 Section "Joint Sealants."
- Q. Grout: Install to comply with ANSI A108.10, unless otherwise indicated.
 - 1. Chemical-Resistant Epoxy Grouts: Comply with ANSI A108.6.
 - 2. Chemical-Resistant Furan Grouts: Comply with ANSI A108.8.
- R. Thresholds: Install thresholds set in same type of thin-set setting bed as abutting field tile, unless otherwise indicated.
 - 1. Set thresholds in latex-portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent nontile floor finish.
- S. Cleaning: After grouting, clean ceramic tile surfaces so they are free of grout and foreign matter.
 - 1. Temporary Protective Coating: Remove by method recommended by coating manufacturer that is acceptable to tile and grout manufacturers. Trap and remove coating to prevent it from clogging drains.

3.2 TILE INSTALLATION

- A. See Plans for TCA designation on detailed drawings. Comply with TCA installation recommendations.
- B. Use Primer or mechanically roughen existing floors for good adhesion. Site verify existing conditions prior to bids.

3.4 CLEANING AND PROTECTION

- A. Cleaning: Upon completion of placement and grouting, clean all tile surfaces so they are free of foreign matter.
 - 1. Unglazed tile may be cleaned with specified solutions only when permitted by tile and grout manufacturer's printed instructions, but no sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of cleaning. Flush surface with clean water before and after cleaning.
- B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work. Install the sealer in methods as recommended by the manufacturer.
- C. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage and wear.
 - 1. Seal all floor joints with a grout sealer as recommended by grout manufacturer and approved by Architect.
 - 2. Prohibit foot and wheel traffic from using tiled floors for at least 7 days after grouting is completed.
 - 3. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

SECTION 09 51 13 – ACOUSTIC PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 SUMMARY

- A. Section Includes all labor & materials as required for complete installation of Acoustic Panel Ceilings including:
1. Acoustical ceiling panels.
 2. Exposed grid suspension system.
 3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings. (Re-use existing wire where salvageable)
- B. Include all items necessary for the completion of work whether or not they are shown in the documents, but are necessary to provide the intended results. Provide custom cutouts or shapes as needed to fit existing ceiling obstructions/penetrations. Site Verify prior to Bids.
- C. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.
- D. Include in Bid cost to re-install all existing ceiling mounted equipment that cannot remain during the ceiling tile replacement.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 2. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 3. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 4. ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 5. ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 6. ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 7. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 8. ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
 9. ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems.
 10. ASTM E 1264 Classification for Acoustical Ceiling Products.
 11. ASTM E 1477 Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
 12. ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 13. ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material.
- B. ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"

1.4 SUBMITTALS

- A. Product Data: In accordance with Section 01 33 00, submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
- B. Samples: In accordance with Section 01 33 00, submit minimum 6 inch x 6 inch samples of

specified acoustical panel; samples of exposed wall molding and suspension system, including main runner and cross tees.

- C. Shop Drawings: In accordance with Section 01 33 00, submit layout and details of acoustical ceilings & Clouds, indicating locations of items which penetrate tile and are to be coordinated with, or supported by the ceilings. Indicate connection type proposed to secure to concrete structure.
- D. Certifications: Provide manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
- E. Submit Warranty information for review with Shop Drawings.

1.5 MAINTENANCE SUBMITTALS

- A. Acoustical Ceiling Panels: At Project Closeout, provide Owner with 2 boxes (20 tiles per box min.) of each type of tile used in the Project.

1.6 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
- B. Fire Performance Characteristics: Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 - 1. Surface Burning Characteristics: As follows, tested per ASTM E 84 and complying with ASTM E 1264 for Class A products.
 - a. Flame Spread: 25 or less
 - b. Smoke Developed: 50 or less
- C. Coordination of Work: Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems sprinklers and work by others under separate contract with Owner.
- D. Coordination Meeting: Job Superintendent and installer shall conduct meeting 45 days prior to initial ceiling installation. All trades and workers under separate contract shall be notified. Notify Architect 14 days in advance.
- E. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.8 PROJECT CONDITIONS

- A. Space Enclosure: Unless approved by Manufacturer and Architect not install interior acoustical ceilings until space is enclosed and weatherproof, wet work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

1.9 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
 - 1. Acoustical Panels: Sagging and warping

- 2. Grid System: Rusting and manufacturer's defects
- B. Warranty Period: Warranty ALL acoustical panels with humidity protection against sag and grid systems against rust for a period of Ten (10) years from date of Substantial Completion.
- C. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

1.10 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Acoustical Ceiling Units: Furnish 25 extra tiles of each type.
 - 2. Exposed Suspension System Components: Furnish 2 extra types of each part installed.

1.11 MOCK-UP

- A. Mock Up: Provide "mock-up" of each ceiling & cloud type prior to grid installation. Receive Architect's approval prior to proceeding with install. Mockups shall be available for review at regularly scheduled Monthly Meeting.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Ceiling Panels:
 - 1. Armstrong World Industries, Inc.
 - 2. Chicago Metallic Corporation.
 - 4. USG Interiors, Inc.; Subsidiary of USG Corporation
 - 5. Approved Equal.

REFER TO CEILING PLAN FOR TILE ORIENTATION AND ADDITIONAL REQUIREMENTS.

2.2 ACOUSTICAL CEILING UNITS (See Room Finish Schedule for Types)

- A. Acoustical Ceiling **Type 1**: New Offices & New Areas excepted as noted
 - 1. Surface Texture: Fine
 - 2. Composition: Mineral Fiber
 - 3. Color: White
 - 4. Size: 24in X 24in X 1"
 - 5. Edge Profile: Square for interface with compatible new 15/16" white grid
 - 6. Acceptable Product
 - a) Armstrong World Industries Ultima 1940 24" x 24", 15/16" white grid.
 - b) Approved Equal
- B. Acoustical Ceiling **Type 2**: (Moisture or Durability)
 - 1. Surface Texture: Fine
 - 2. Composition: Fiberglass
 - 3. Color: White
 - 4. Size: 24in X 24in X 3/4 in
 - 5. Edge Profile: Square for interface with compatible 15/16" white grid.
 - 6. Acceptable Products:
 - a) Armstrong World Industries **Outdoor Georgian High Washability** square layin
 - b) Approved Equal
- C. Acoustical Ceiling **Type 3: Existing Areas with grid to support new tile**
 - 1. Surface Texture: Fine
 - 2. Composition: Mineral Fiber
 - 3. Color: White

1. Size: 24in X 48in X 1in **Ultima 1943** square layin
4. Edge Profile: Square for interface with compatible 15/16" white grid
- D. Acoustical Ceiling **Type 4**: Sound Control
 5. Surface Texture: Fine
 6. Composition: Mineral Fiber
 7. Color: Black
 8. Size: 24in X 24in X 1in
 9. Edge Profile: Square for interface with compatible 15/16" black grid
 1. Armstrong World Industries **Ultima 1940** square layin
 2. Approved Equal

Include in Bid cost to paint black if not available

2.3 EXPOSED SUSPENSION SYSTEMS FOR ACOUSTICAL PANELS

- A. Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with 15/16 IN type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel in baked polyester paint. Main beams and cross tees shall have rotary stitching
 1. Structural Classification: ASTM C 635 HD.
 2. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
 3. Acceptable Products by the following manufacturers:
 - a) Armstrong World Industries
 - b) USG
 - c) Chicago Metallic
 - d) Approved Equal in accordance with Section 01 25 00
- B. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three design load, but not less than 12 gauge.
- D. Hold-Down Clips: Provide manufacturer's standard hold-down clips spaced at 24 inches (610mm) o.c. on all cross tees at Entrance Vestibules after confirming acceptance with User Agency.
- E. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as 'exposed runner.

2.5 ACOUSTICAL SEALANT

- A. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the work include:
 1. Acoustical sealant for Exposed and Concealed Joints:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant
 - b. USG Corporation; SHEETROCK Acoustical Sealant
 - c. Approved equal.
 2. Acoustical Sealant for Concealed Joints:
 - a. Henkel Corporation; OSI Pro-Series SC-175 Acoustical Sound Sealant
 - b. Pecora Corporation; AIS-919
 - c. Tremco, Inc.; Tremco Acoustical Sealant
 - d. Approved equal.
- B. Acoustical Sealant: Manufacturer's standard sealant complying with ASYM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 1. Exposed and Concealed Joints: Non-sag, paintable, non-staining latex sealant.
 2. Concealed Joints: Nondrying, non-hardening, non-skinning, non-staining, gunnable, synthetic-rubber sealant.

PART 3 - EXECUTION**3.1 COORDINATION**

- A. Do not begin final installation until all work above ceiling by this Contract or by Owner's Separate Contract is complete.
- B. Do not proceed with installation until all wet work such as concrete, terrazzo, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.
- C. Do not begin work until Fire Marshal and other Regulatory Agency personnel have inspected fire wall and rated partitions which extend from floor to deck or bottom of roof.

3.2 SITE CONDITIONS

- A. Do not proceed with installation until all wet work such as concrete, tile, plastering and painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.

3.3 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
- B. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
 - 1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.4 INSTALLATION

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and the authorities having jurisdiction.
- B. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, counter-splaying or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling-suspension members and to above supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws or other devices that are securer and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion or elevated temperatures.
 - 5. Space hangers not more than 48 inches (1200mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
 - 6. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, steel deck tabs or concrete deck. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.
- D. Install edge molding and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels..
 - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of molding before they are installed.

2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
 - E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent or kinked members.
 - F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 1. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 2. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
 3. Install hold-down clips in Entrance Vestibules, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions unless otherwise indicated.
- 3.6 ADJUSTING AND CLEANING
- A. Replace damaged and broken panels.
 - B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Touch up minor scratches with paint if undetectable by the naked eye. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 65 13 - RESILIENT WALL BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 1. Section 06 40 23 "Interior Architectural Millwork."
 2. Section 06 41 00 "Casework."
 3. Section 09 65 19 "Resilient Tile Flooring."
 4. Section 09 68 13 "Carpeting"

1.2 SUMMARY

- A. Section Includes all labor & materials as required for complete installation of:
 1. Resilient wall base where scheduled and along all base cabinet toe kicks..
 2. Resilient flooring accessories.
 3. On site visual inspection of existing flooring conditions is required prior to Bidding this Work.
- B. Include all items necessary for the completion of work whether or not they are shown in the documents, but are inferable as being necessary to provide the intended results.

1.3 BIDDING REQUIREMENTS

- A. Prior to Bids, the contractor shall decide that there is nothing that would deter the contractor's required warranty, and that no existing conditions at the site preventing the contractor from performing the job in a professional and safe manner. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.4 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and division 1 Specification Sections.
- B. Product data for each type of product specified.
- C. Samples for initial selection purposes of manufacturer's standard sample sets in form of pieces cut from each type of product specified showing full range of colors and patterns available.
- D. Product certificates, in lieu of laboratory test reports when permitted by Architect, signed by manufacturer certifying that each product complies with requirements.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility for products: Obtain each type and color of product specified from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- B. Fire Performance characteristics: Provide products with the following fire performance characteristics as determined by testing products per ASTM test method indicated below by UL.
 1. Cove Base:
 - a. Class B rating in ASTM E-84, NFPA 255, UL No. 273, ANSI 2.5, UBC No. 42.1 "Tunnel Test" with a smoke density of 150-200.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to Project site in original manufacturer's unopened cartons and containers, each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

- B. Store products in dry spaces protected from the weather with ambient temperatures maintained between 50 degrees F (10 degrees C) and 90 degrees F (32 degrees C).
 - C. Move products into spaces where they will be installed at least 48 hours in advance of installation.
- 1.7 PROJECT CONDITIONS
- A. Maintain a minimum temperature of 70 degrees F (21 degrees C) in spaces to receive products specified in this Section for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 degrees F (13 degrees C).
 - B. Do not install products until they are at the same temperature as that of the space where they are to be installed.
 - C. Close spaces to traffic during installation of products specified in this Section.
- 1.8 SEQUENCING AND SCHEDULING
- A. Sequence installing products specified in this Section with other construction to minimize possibility of damage and soiling during remainder of construction period.
- 1.9 MOCK UP
- A. Install sample piece of straight & corner base for Architect's approval. Notify Architect 7 business days prior to installation.
- 1.10 TOLERANCES
- A. Base shall be installed evenly, straight, square & plumb to wall & floor without waves or gaps.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include:
 1. Burke Mercer Flooring Products.
 2. Johnson Rubber Company.
 3. Flexco.
 4. Roppe Corp. USA
 5. Approved equal.

2.2 RESILIENT WALL BASE

- A. Rubber Wall Base: Products complying with the following requirements.:
- B. Resilient Base Standard: ASTM F 1861.
 1. Material Requirement: Type TS (rubber, vulcanized thermoset).
 2. Manufacturing Method: Group I (solid, homogeneous).
 3. Style: Cove (base with toe) at tile and Straight (flat or toeless) at all carpeting.
- C. Minimum Thickness: 0.125 inch (3.2 mm).
- D. Height: 4 inches (102 mm) & 6 inches (153 mm) as indicated on plans.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Job formed or preformed.
- G. Inside Corners: Job formed.
- H. Finish: Matte.
- I. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 TRANSITION STRIPS

- A. Material: Rubber
- B. Profile & Dimensions: As indicated on plan and as needed for smooth ADA compliant transition between resilient & carpet tiles with adjacent materials.
- C. Colors: as selected by Architect from full range of industry standards.

2.4 INSTALLATION ACCESSORIES

- A. Concrete Slab Primer: Nonstaining type as recommended by flooring manufacturer.
- B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland- cement-based formulation provided or approved by flooring manufacturer for applications indicated.
- C. Adhesives: Water-resistant type recommended by manufacturer to suit resilient flooring product and substrate conditions indicated.

2.5 EXTRA MATERIALS

- A. Provide Owner with any leftover materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas where installation of products specified in this Section will occur, with Installer present, to verify that substrates and conditions are satisfactory for installation and comply with manufacturer's requirements and those specified in this Section.

3.2 PREPARATION

- A. General: Comply with manufacturer's installation specifications for preparing substrates indicated to receive products indicated.
- B. Use trowelable leveling and patching compounds per manufacturers directions to fill cracks, holes, and depressions in substrates.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.
- D. Broom or vacuum clean substrates to be covered immediately before installing products specified in this Section. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust and prepare surface as recommended by manufacturer for proper application.
- E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.

3.3 INSTALLATION

- A. General: Install products specified in this Section using methods indicated according to manufacturer's installation directions.
- B. Apply resilient wall base to walls, columns, pilasters, casework, and other permanent fixtures in rooms and areas where base is required. Install wall base in lengths as long as practicable. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
 1. On irregular substrates, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.
 2. Install inside and exterior corners before installing straight pieces.
 3. Form inside corners on job from straight pieces of maximum lengths possible by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce snug fit to substrate.
 4. Form outside corners on job from straight pieces of maximum lengths possible by shaving back of base at point where bending will occur. Remove a strip perpendicular to length of base and only deep enough to produce a snug fit without bends whitening or removal of more than half the thickness of wall base.
- C. Place resilient transitions strips so they butt adjacent materials of type indicated and bond to substrates with adhesive. Install reducer strips at edges of flooring that otherwise would be exposed.

3.4 TOLLERANCE

- A. General: Installed products shall be straight and not wave in any direction more than $\frac{1}{4}$ " in 24".

3.5 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing installation:
1. Remove visible adhesive and other surface blemishes using cleaner recommended by manufacturers of resilient product involved.
 2. Sweep or vacuum floor thoroughly.
 3. Do not wash floor until after time period recommended by manufacturer.
 4. Damp-mop resilient accessories to remove black marks and soil.
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by manufacturer of resilient product involved.
1. Cover resilient accessories on floors and stairs with undyed, untreated building paper until inspection for Substantial Completion.

END OF SECTION

SECTION 09 65 15 LUXURY VINYL TILE

PART 1 GENERAL

1.0 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.01 SUMMARY

- A. This Section includes all labor & materials as needed for complete installation of LVT floor including all accessories and products for a smooth transition to adjacent flooring. (See Plans for Schedules & Locations)
- C. Limited existing flooring has been removed by Asbestos Abatement Contractor outside of this contract.
- D. Provide leveling agent and filler patch on all floors as needed for leveling prior to new flooring installation.
- E. **FULL VISUAL INSPECTION REQUIRED PRIOR TO BIDS** - Contractor shall be responsible for visually inspecting all existing floor areas scheduled to receive new flooring prior to bid date and include in bid the cost of all preparatory work for a uniform looking, top quality flooring installation, including all floor leveling materials and crack suppression membranes over all large cracks, control joints and expansion joints

1.02 RELATED SECTIONS

- A. Section(s) related to this Section include:
1. Wood & Plastics: Division 6.
 2. Thermal & Moisture Protection: Division 7.
 3. Resilient Tile: Division 9

1.03 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. American Society for Testing & Materials (ASTM):
1. ASTM D2047 Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
 2. ASTM E648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 3. ASTM E84 Flame Spread
- C. Resilient Floor Covering Institute (RFCI)
1. RFCI Standard Slab Moisture Test Method (Calcium Chloride Method).

1.04 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
- B. Product Data: Submit product data, including manufacturer's information, for specified products.

- C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including drain details, accessories, finish colors, patterns and textures.
- D. Samples: Submit selection and verification samples for finishes, colors and textures.
- E. Quality Assurance Submittals: Submit the following:
 - 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
 - 2. Manufacturer's Instructions: Current published manufacturer's installation and maintenance instructions.
 - 3. Manufacturer's Field Reports: Manufacturer's field reports specified herein.
- F. Closeout Submittals: Submit the following:
 - 1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
 - 2. Warranty: Warranty documents specified herein.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Experienced in performing work of this section and who is specialized in the installation of work similar to that required for this project. Installation of Plank & Tile shall follow the instructions detailed in the Manufacturer Installation Guide.
- B. Mock-ups: Install at project site a job mock-up using acceptable products and manufacturer approved installation methods, including concrete substrate testing. Obtain Owner's and Consultant's acceptance of finish color, texture and pattern, and workmanship standards.
 - 1. Mock-up Size: 3' x5'
 - 2. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
 - 3. Incorporation: Mock-up may be incorporated into final construction upon Owner's approval.
- C. Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.06 DELIVERY, STORAGE & HANDLING

- A. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer.

1.07 PROJECT CONDITIONS

- A. Temperature Requirements: If storage temperature is below 68F (20C), move the flooring to a warmer place and allow to reach this temperature before installation. Maintain temperature of installation area between 68F (20C) and 80F (26C) for a period of at least 72 hours prior to, during,

and after completion of the installation for acrylic adhesives (12 hours after completion for polyurethane adhesives).

1.08 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

PART 2 PRODUCTS

2.01 LUXURY VINYL TILE

- A. Manufacturer equal to: Mannington
- B. Product equal to: Nature's Path 20 **20 mil. With V 88 Adhesive, color by Architect from full range of color selection.**
- C. Warranty Period: 10 Years commencing on Date of Installation.

2.02 ACCESSORIES

- A. V 95 Epoxy Adhesive

2.03 PRODUCT SUBSTITUTIONS

- A. Substitutions: Per Section 01 25 00. Include samples, photographs of recent installations and warranty.

2.04 SOURCE QUALITY

- A. Source Quality: Obtain flooring products from a single manufacturer.

2.05 REDUCER STRIP at Door transitions with different height flooring

- 1. Per Manufacturer recommendation.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog, installation instructions and product label instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- B. Subfloors/underlayments shall be dry, clean and smooth. They shall be free of dust, solvents, varnish, paint, wax, oil, grease, residual adhesive, adhesive removers, permanent markers and other foreign materials that might affect the adhesion of resilient flooring or cause a discoloration of the flooring from below.
- C. Spray paints, permanent markers and other indelible ink markers must not be used to write on the back of the flooring material or used to mark the concrete slab as they could bleed through, telegraphing up to the surface and permanently staining the flooring material. If these contaminants

are present on the substrate, they must be mechanically removed prior to the installation of the flooring material.

3.03 PREPARATION

- A. Flooring shall be installed over subfloors conforming to ASTM F710 for concrete and other monolithic floors or ASTM F1482 for wood subfloors.
- B. Moisture Testing: Moisture emissions from concrete subfloors must not exceed 5 lbs per 1000sf per 24 hours (2.25 kg H₂O/24 hr/93 m²) via the Calcium Chloride Test Method (ASTM F1869) and not to exceed 90% relative humidity as tested in accordance with ASTM F2170-02. If subfloor moisture exceeds the allowable maximum for installing the products, call the manufacturer for advice.
- C. The pH level of the subfloor surface shall not be higher than 9.9. If higher, subfloor must be neutralized.
- D. Underlayment and Patching Compounds: Use only gray colored Portland cement based underlayments; patching compounds are used for filling cracks, holes and leveling. White gypsum materials are not acceptable.

3.04 INSTALLATION

- A. Plank & Tile Installation: Install products in accordance with the current published manufacturer Installation Guide including temperature requirements.
- B. Remove and re-install thresholds where tile is to be installed. Neatly cut flooring to butt adjacent flooring or install vinyl transition piece.

3.05 FIELD QUALITY REQUIREMENTS

- A. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.06 CLEANING & POLISHING

- A. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project site and legally dispose of debris. Apply coat of ZEP Wet Look Floor polish for high gloss. DO NOT USE WAX UNLESS SPECIFICALLY LISTED BY MANUF.

3.07 PROTECTION

- A. Protection: Protect the newly installed flooring from foot traffic for 24 hours and heavy rolling traffic for 72 hours.
Protect installed product and finish surfaces from damage during construction.
- B. Cover and protect finished installation from damage that may be caused by other trades using a plywood or non-staining temporary floor protection system, such as textured plastic sheeting.

End

SECTION 09 65 19 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Section 09 65 13 "Resilient Base and Accessories" for reducer strips and other accessories installed with resilient floor coverings.

1.3 SUMMARY

- A. This Section includes all labor & materials as needed for complete installation of vinyl composition floor tile. (See Plans for Schedules & Locations)
- B. Vinyl Tread/Riser system for stairs
- C. Limited existing flooring has been removed by Asbestos Abatement Contractor outside of this contract.
- D. Provide leveling agent and filler patch on all floors as needed for leveling prior to new flooring installation.
- E. VISUAL INSPECTION REQUIRED PRIOR TO BIDS - Contractor shall be responsible for visually inspecting all existing floor areas scheduled to receive new flooring prior to bid date and include in bid the cost of all preparatory work for a uniform looking, top quality flooring installation.

1.4 BIDDING REQUIREMENTS

- A. Prior to Bids, the contractor shall decide that there is nothing that would deter the contractor's required warranty, and that no existing conditions at the site prevent the contractor from performing the job in a professional and safe manner. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Product data for each type of product specified.
 - 1. Certification by tile manufacturer that products supplied for tile installation complies with local regulations controlling use of volatile organic compounds (VOC's).
- C. Samples for initial selection purposes in form of manufacturer's color charts consisting of actual tiles or sections of tiles showing full range of colors and patterns available for each type of resilient floor tile indicated.

1.6 QUALITY ASSURANCE

- A. Single-Source Responsibility for Floor Tile: Obtain each type, color, and pattern of tile from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- B. Vinyl Tile must meet Scientific Certification System's FloorScore Program Criteria. Product Equal to Armstrong Imperial Texture is acceptable.
- C. Stair Riser, Tread, & Base System must also be FloorScore Certified. Product Equal to Armstrong Stair Tread Riser Base is acceptable.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver tiles and installation accessories to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.
- B. Store flooring materials in dry spaces protected from the weather with ambient temperatures maintained between 50 deg F (10 deg C) and 90 deg F (32 deg C).
- C. Store tiles on flat surfaces. Move tiles and installation accessories into conditioned spaces where they will be installed at least 48 hours in advance of installation.

1.8 PROJECT CONDITIONS

- A. Maintain a minimum temperature of 70 deg F (21 deg C) in spaces to receive tiles for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, until Substantial Completion, maintain a temperature of not less than 55 deg F (13 deg C).
- B. Do not install tiles until they are at the same temperature as the space where they are to be installed.
- C. Close spaces to traffic during tile installation.
- D. Moisture Testing - Include in Bid the cost to perform moisture (Calcium Chloride) Test per 2000 SF of floor areas prior to floor installation. Should moisture test reveal that excessive moisture is present, advise Architect.

1.9 SEQUENCING AND SCHEDULING

- A. Install tiles and accessories after other finishing operations, including painting, have been completed.
- B. Do not install tiles over concrete slabs until the slabs have cured and are sufficiently dry to bond with adhesive as determined by tile manufacturer's recommended bond and moisture test.

1.10 WARRANTY

- A. Manufacturer's standard 5 (five) year limited warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Vinyl Composition Tile: Subject to compliance with requirements, resilient floor tiles that may be incorporated in the Work include:
 - 1. Armstrong World Industries www.armstrong.com
 - 2. Azrock www.azrock.com
 - 3. Mannington Resilient Floors www.mannington.com
 - 4. Prior Approved Equal

Color shall be selected by Architect from full range of colors.

2.2 RESILIENT TILE (Only IF/WHERE shown on Room Finish Schedule)

- A. Vinyl Composition Floor Tile: STANDARD TILE, STANDARD PATTERN, Products complying with ASTM F 1066, Composition 1 (non-asbestos formulated), and with the following requirements:
 - 1. Class 2: Through tile pattern.
 - 2. Gage: 1/8" thick.
 - 3. Static Load Limit: not less than 75 psi.
 - 4. Color: as selected by Architect
 - 5. Size: 12"x12"
 - 6. Coefficient of friction: conforming to ADA, 6 min. wet, .7 min. dry

2.04 VINYL STAIR TREADS, RISERS AT STAIRS

The following specification uses Johnsonite Company products to establish quality. Equals by Flexco, Musson Rubber Co., RCA Rubber Company, or approved equals.

Requirements: All products shall comply with ADA Requirements including the visually impaired, and commercial requirements for slip resistance.

- A. Stair Tread: Shall be Tarkett Heavy Duty Safe-T-Rib square nose, Color by Architect, with yellow Safe-T-Grip 2" abrasive strip insert.
- B. Stair Riser: Shall be Tarkett 7" X length X .125" vinyl riser. Color shall be selected by Architect.
- C. Stair Stinger: Shall be 10" height Tarkett product to match riser material.
- D. Stair Landings: Shall be Tarkett Vinyl to match the above tread with visually impaired tactile warning at bottom landing for ADA approval.
- E. Adhesive shall be 2 component epoxy type recommended by manufacturer for maximum adhesion.

2.3 INSTALLATION ACCESSORIES

- A. Concrete Slab Primer: Non-staining type as recommended by flooring manufacturer.
- B. Adhesives (Epoxy): Water-resistant type recommended by tile manufacturer for flood proof application of resilient floor tile products and substrate conditions indicated.
- C. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edge of tiles, and in maximum available lengths to minimize running joints.
- D. Rubber transition strips in compliance with ADA requirements where floor surfaces change material.

2.4 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents.
 - 1. Furnish in whole boxes, two 12 tile boxes of each type & color and size of resilient floor tile installed.
 - 2. Provide a typed list of materials with quantities.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. General: Examine areas where installation of tiles will occur, with Installer present, to verify that substrates and conditions are satisfactory for tile installation and comply with tile manufacturer's requirements and those specified in this Section.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by tile manufacturer.
 - 2. Finishes of subfloors comply with tolerances and other requirements specified in Division 3 Section "Cast-In-Place Concrete" for slabs receiving resilient flooring.
- C. Correct all unsatisfactory conditions prior to installation of flooring so that when finished, the flooring will appear level without irregularities.
- D. Allowable Substrate Tolerances:
 - 1. Thin set method:
 - a. Maximum variation in substrate surface: 1/8 inch in 8 feet.
 - b. Maximum height of abrupt irregularities: 1/32 inch.

3.2 PREPARATION

- A. General: Comply with manufacturer's installation specifications to prepare substrates indicated to receive

- tile.
- B. Use trowelable leveling and patching compounds per tile manufacturer's directions to fill cracks, holes, and depressions in substrates.
 - C. Remove coatings, including curing compounds, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush.
 - D. Broom or vacuum clean substrates to be covered by tiles immediately before tile installation. Following cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust.
 - E. Apply concrete slab primer, if recommended by flooring manufacturer, prior to applying adhesive. Apply according to manufacturer's directions.

3.3 INSTALLATION

- A. General: Comply with tile manufacturer's installation directions and other requirements indicated that are applicable to each type of tile installation included in Project.
- B. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths at perimeter that equal less than one-half of a tile. Install tiles square with room axis.
- C. Match tiles for color and pattern by selecting tiles from cartons in same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures. Discard broken, cracked, chipped, or deformed tiles.
 - 1. Lay tiles with grain running in one direction.
- D. Where accordion partitions and other items are indicated for installing on top of finished tile floor, install tile before these items are installed.
- E. Scribe, cut, and fit tiles to butt tightly to vertical surfaces, permanent fixtures, built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.
- F. Extend tiles into toe spaces, door reveals, closets, and similar openings.
- G. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other nonpermanent marking device.
- H. Use full spread of adhesive applied to substrate in compliance with tile manufacturer's directions including those for trowel notching, adhesive mixing, and adhesive open and working times.
- I. Hand roll tiles where required by tile manufacturer.
- J. Place resilient accessories so they are butted to adjacent materials of type indicated and bond to substrates with adhesive. Install reducer strips at edges of flooring that otherwise would be exposed.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after completing tile installation:
 - 1. Remove visible adhesive and other surface blemishes using cleaner recommended by tile manufacturers.
 - 2. Sweep or vacuum floor thoroughly.
 - 3. Do not wash floor until after time period recommended by resilient floor tile manufacturer.
 - 4. Damp-mop tile to remove black marks and soil.
 - 5. Apply multiple (3-5) coats of a high quality cross-linked acrylic floor finish to the thoroughly clean, dry floor to protect the surface.
- B. Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by tile manufacturer.
 - 1. Cover tiles with undyed, untreated building paper until inspection for Substantial Completion.

2. Do not move heavy and sharp objects directly over tiles. Place plywood or hardboard panels over tiles and under objects while they are being moved. Slide or roll objects over panels without moving panels.
- C. Clean tiles not more than 4 days prior to dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean tiles using method recommended by manufacturer.

END OF SECTION

SECTION 09 68 10 – TURF

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 SUMMARY

- A. This section includes all labor & materials as required for complete installation of the following:
 - 1. Artificial Turf - See Room Finish schedule for Area 154 Covered Outdoor Space.
 - 2. Transition Strip of rubber or vinyl trim piece between vertical and horizontal & edge changes.
- B. Limited existing flooring has been removed by Asbestos Abatement Contractor outside of this contract.
- C. Provide leveling agent and filler patch on all floors as needed for leveling prior to new flooring installation.
- D. VISUAL INSPECTION REQUIRED PRIOR TO BIDS - Contractor shall be responsible for visually inspecting all existing floor areas scheduled to receive new flooring prior to bid date and include in bid the cost of all preparatory work for a uniform looking, top quality flooring installation.
- E. Related sections:
 - 1. Section 09 65 13 "Resilient Base & Accessories"

1.3 BIDDING REQUIREMENTS

- A. Prior to Bids, the contractor shall decide to his satisfaction that all the drawings and specifications are workable as specified, that there is nothing that would deter the contractor's required warranty, and that no existing conditions at the site prevent the contractor from performing the job in a professional and safe manner. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.4 SUBMITTALS

- A. Manufacturer's Data - Submit two (2) copies of manufacturer's specifications and installation instructions for carpet tile and related items specified.
- B. Fiber and backing verification - Certification from the producer verifying use of the branded fiber and backing in the submitted carpet product. Certification should include the % recycled content by weight for fiber and backing, describing the source of this recycled content. If virgin nylon or backing is used, the manufacturer shall include as part of the fiber and backing certification, the precise method that will be used to recapture the nylon and backing at the end of the useful life of the carpet tile. State how it will be returned to carpet production, fiber into fiber and backing into backing. Fiber types shall not be mixed to facilitate future recycling.
- C. Shop Drawings - Submit shop drawings for areas to be carpeted showing installation of carpeting, seam diagram, pattern direction, necessary installation accessories, and provisions for work of other trades. Show location of different patterns or styles of carpet. Also, show locations of any threshold conditions.
 - 1. The construction manager will supply reproducible prints on request, to facilitate shop drawing preparation.
- D. Samples - Submit standard size carpet samples of each type of carpet, in each specified pattern, color and construction.
 - 1. Any alternates to specified products must be submitted to Architect for approval by a representative of the end user at least ten (7) working days prior to bids..
 - 2. Final Sample Submittal - Submit two (2) sets of samples for each carpet type.

3. No carpet shipments are permitted until acceptance of final samples by representative of the end user or architect/design firm, certifying that samples are the approved color, pattern, and texture.
 4. Custom Color Only - Quality color samples shall be signed by a representative of the end user or architect/design firm, certifying that samples are the approved color, pattern, and texture.
 5. Samples submitted will be assumed to be the manufacturer's best obtainable match to the carpet described under Materials section.
- E. Maintenance Instructions - Submit to the Construction Manager two (2) copies of the manufacturer's carpet maintenance instructions, including information needed for the removal of common stains from each type of carpet required.
1. A representative from the carpet manufacturer shall meet with the Construction Manager in the presence of a representative of the User Agency and architect firm to review the recommended procedures, prior to occupancy of the finished spaces.
- G. Spare Tiles: provide 12 extra tiles of each field color and 2 extra tiles of each accent solid color to User Agency in properly labeled boxes.

1.5 QUALITY ASSURANCE

- A. Manufacturer - Carpet manufacturer shall have no less than three years of production experience with recyclable carpet tile (fiber to fiber and backing to backing) similar to type specified in this document; and whose published product literature clearly indicates compliance of products with requirements of this section.
- B. Trade Contractor - firm with not less than five years of successful carpet tile experience similar to work of this Section and recommended and approved by the carpet manufacturer. Upon request, submit letter from carpet manufacturer stating certification qualifications and acceptance of all environmental requirements.
- C. Substitutes - Where a selected manufacturer or product has been specified, an equal or superior product must be submitted to the Architect no less than (7) working days prior to bids. Product may be accepted only upon review of data & sample tile and written acceptance by the architect. It is mandatory that such review and approval be obtained prior to bidding, or the substitution will not be considered. All such proposed substitutions shall be submitted to the architect with appropriate manufacturer's specifications, literature, environmental compliance assurance, independent laboratory testing data and sample of carpet. The architect's decision as to whether a product is equal or superior to the one specified shall be final. This section applies to any "or equal" noted in the specification.

1.6 PRODUCT DELIVERY AND STORAGE

- A. Deliver carpeting materials in sealed protective packaging for carpet tile and sealed containers for related materials. Carpet materials shall be bound with secure protective wrapping. Consideration should be given to bulk packaging of carpet tile when delivery is made to the jobsite for immediate installation to reduce packaging waste.
- B. Storage and staging area at the site must be coordinated with the Construction Manager.
- C. Materials shall be stored in an enclosed and dry area protected from damage and soiling.

1.7 PRE-INSTALLATION MEETING

- A. The manufacturer shall meet at the project site with representatives of end user, Construction Manager and the Trade Contractor to review the carpet installation procedure and coordination with other trades. The Trade Contractor must have available at this meeting the carpet manufacturer's installation procedures, instructions for the carpet types specified in the various applications required.
- B. Store carpet in working areas which have been enclosed and have maintained environmental conditions as those planned for occupancy. Carpet shall be allowed to reach room temperature or minimum temperature recommended by manufacturer before installation.

1.8 WARRANTY

- A. Provide warranties by Carpet Manufacturer and Trade Contractor agreeing to replace defective materials and workmanship of carpet work during one (1) year warranty period following substantial completion. Also, submit carpet manufacturer's warranties as follows:
- B. Submit manufacturer's certified independent test results to show that carpet meets or exceeds product performance specification criteria for carpet testing requirements (i.e. see section 2.3 flame, smoke, Aachen test, etc.).
- C. Lifetime Commercial Limited Warranty - Owner will be completely satisfied with the performance of the carpet product when installed in accordance with the manufacturer's current installation specifications and is maintained in accordance with the current carpet care recommendations and such maintenance continues throughout the duration of the original installation when owned and maintained by the original end user.

PART 2 - PRODUCTS

2.1 MANUFACTURER –

Prior Approved Equal in accordance with Section 01 25 00 will require actual samples of carpet.

2.2 TURF – Equal to Shawgrass “Elevate 48 5mm .75” with 5mm Urethane cushion. Field Green

2.4 RELATED CARPET MATERIALS

- A. Leveling Compound - Latex type as recommended by carpet manufacturer and is compatible with carpet adhesive and curing/sealing compound on concrete.
- B. Adhesive –Release Type as recommended by carpet manufacturer which complies with flammability requirements. Note: Adhesive on the ground floor shall be water resistant type as recommended by manufacturer because it is believed that the 50 year old plastic vapor barrier sheet membrane has deteriorated.
- C. Carpet Edge Guard, Nonmetallic - Extruded or molded heavy duty vinyl or rubber carpet edge guard of size and profile indicated and with minimum 2 inch wide anchorage flange; colors selected by architect/designer from among standard colors available within the industry. **Use ample adhesive for good adhesion to substrate.**
- D. Miscellaneous Materials - As recommended by manufacturer of carpet, cushion and other carpeting products and selected by Trade Contractor to meet project circumstance and requirements.

PART 3 - EXECUTION

3.1 PRE-INSTALLATION REQUIREMENTS AND PREPARATORY WORK

- A. The Trade Contractor shall measure carefully and check all dimensions and other conditions in the field to insure proper fit in the areas designated. Trade Contractor shall be totally responsible for the accuracy of his measurements on total yardage requirements, individual floor yardage requirements and dye lot yardage requirements. No request for carpet or installation extras from the owner will be considered due to measurement or takeoff errors by the Trade Contractor. The Trade Contractor shall confirm total yardage required, including spare tiles along with bid.
- B. The Contractor shall review all conditions at time of installation and prepare as necessary for a flawless job. Install floor leveling compound and crack suppression membrane as needed prior to carpet installation.
- C. Sequence carpeting with other work so as to minimize possibility of damage and soiling of carpet during remainder of construction period. Carpet installation must not commence until painting and finishing work is complete and ceiling and other overhead work has been tested, approved and completed, unless specifically approved by owner's Project Manager, in writing.
- D. Trade Contractor and manufacturer's representative must examine substrates for conditions over which carpeting is to be installed PRIOR TO INSTALLATION
 - 1. New concrete (including concrete patch) shall be allowed to cure for ninety (90) days before carpet installation.

2. Bond and Moisture Test shall be performed in compliance with ASTM D 4263-93, Standard Test Method for indication of Moisture in Concrete by Plastic Sheet Method after room temperature and humidity reached design conditions. Trade Contractor shall perform moisture content testing as required in manufacturer's instructions to ensure pH readings of no more than 9. Moisture transmission of 5.5 pounds per sq. meter per 24 hours is acceptable. If values exceed this level manufacturer's recommendations must be followed for moisture transmission mitigation. Do not proceed until bond and moisture testing has been done to assure that moisture levels and alkalinity are acceptable levels to the manufacturer of carpet & adhesive. Testing technician shall be certified by the Academy of Flooring and Textiles. Provide Test Results to the Architect.
 3. Cracks 1/16 inch or more, holes, unevenness and roughness must be filled, leveled and made smooth with a compatible latex floor patching compound. Prior to filling, the floor must be swept clean of all loose granular debris. After filling, allow filler to dry. Then damp mop the floor with warm water and allow drying. Vacuum after mopping, to ensure all loose granular debris is removed and provide a proper substrate to install carpet.
- F. All surfaces to receive carpet shall be clean and dry, and in a condition satisfactory to the Trade Contractor. Trade Contractor shall notify Construction Manager in writing of any conditions which will prevent him from producing satisfactory finish work after above specified preparatory work is completed.
- G. Trade Contractor shall vacuum floors again immediately before installation of carpeting.
- H. Confirm compatibility of adhesive with curing compounds on concrete floors. All adhesives and curing compounds shall comply with the CRI Green Label Certification program for low VOC.
- I. Environmental Conditions - Areas to be carpeted must be pre-heated at a minimum of 68° F. for 72 hours prior to installation with the relative humidity not more than 65%. A minimum temperature of 50° F. shall be maintained thereafter. Carpet and adhesive must be stored at a minimum temperature of 68° F. for 72 hours prior to installation.
- J. Once the Trade Contractor commences installation work under this contract, it shall be assumed that the condition of the floor has been accepted and any repairs or further corrections in the floor surface shall become the responsibility of the Trade Contractor.

3.2 INSTALLATION

- A. General
1. Comply with manufacturer's instructions and recommendations for uniformity of direction of carpet installation.
 2. Install carpet under open-bottom obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.
 3. Provide cut outs where required. Conceal cut edges with protective edge guards or overlapping flanges.
 4. Run carpet under open-bottom items such as heating convectors and install tight against walls, columns and cabinets so that the entire floor area is covered with carpet. Cover over all floor type door closures.
 5. Install edging guard at all openings and doors wherever carpet terminates, unless indicated otherwise. Prior to installation, report to the Construction Manager all other obstructions which may occur.
 6. Cutting shall be done in accordance with the manufacturer's recommendation, using the tools designed for the carpet being installed.
 7. Edges shall be butted together with the proper pressure to produce the tightest joint possible without distortion.
 8. All carpet shall be installed with pile-lay in the same direction except when directed to use a quarter turned method as specified in the drawings.
 9. Use leveling compound where necessary. Any floor filling or leveling shall have a minimum of 4'0" of feather.
 10. Expansion joints - Do not bridge building expansion joints with continuous carpeting. Provide for movements.

B. Installation

1. Install carpet according to carpet manufacturer's printed instructions.
2. Measuring - Divide the room into four quadrants and snap a chalk line. Make sure quadrants meet at right angles (offset the center line, if necessary, to ensure that perimeter tiles will be cut no less than half size (9 inches).
3. Apply environmentally approved adhesive as per instructions in the area to be carpeted first.
4. Note carefully if the product is designed to be installed "quarter turned" only. Arrows should point in the same direction every other tile and diagonally. Arrows on alternating tiles should be turned 90° in either direction, consistently.
5. Begin installing by laying an anchor row of tiles on one side of the center chalk line. Ensure straight lines and square corners. Repeat anchor rows in each quadrant, extending out from center. Fill in each quadrant with tiles using a stair step technique.
6. Tip individual tiles into place to avoid catching pile in the joint. Frequently check tile joints for proper alignment and firm abutment.
7. Although tiles are nominally 24 inches by 24 inches square, there will be slight gain due to joints. To check, measure 10 installed tiles from edge to edge, spanning 10 joints. This measurement should be no greater than 240 and 1/8 inches for tufted product. If more gain is measured, tiles are not butted tightly enough. Reposition and check again. Use this method to continually check for excessive gain. See manufacturer's instructions for 24" x 24" modular tiles.
8. Fixtures, architectural elements, and perimeters will require tile cutting. Cut tiles from the back. Secure cut or partial tiles with adhesive.
9. Electrical floor outlets are usually wired after tile installation. Install tile over electrical boxes and mark locations with a piece of tape. Tiles can be lifted for cut-outs later.
10. Center trench headers directly under a full tile row.
11. In open perimeter designs, use a fixed reducer strip to secure the tile area.

3.4 CLEANING AND PROTECTION

- A. On completion of the installation in each area, all dirt, carpet scraps, etc., must be removed from the surface of the carpet. Any soiling spots or excessive adhesive on the carpet shall be removed with the proper spot remover. (See Section 1.3.7)
- B. Construction traffic other than as may be required to fit up specific carpeted area will not be allowed to traverse the completed work.
- C. Protect carpeting against damage during construction. Cover with 6-mil thick polyethylene covering with taped joints during the construction period, wherever protection is required, so that carpet will be without any indication of deterioration, wear, or damage at the time of acceptance. Damaged carpeting will be rejected.
- D. At the completion of the work and when directed by the Construction Manager, vacuum carpet using commercial dual motor vacuum of type recommended by carpet manufacturer. Remove spots and replace carpet where spots cannot be removed. Remove rejected carpeting and replace with new carpeting. Remove any protruding yarns with shears or sharp scissors.
- E. Protection of carpeting shall be maintained on each floor or area until accepted.

3.5 INSPECTION

- A. Preliminary Acceptance - Upon completion of the carpet installation of each floor, it shall be inspected by Owner, the Construction Manager and Trade Contractor.
- B. Upon completion of the installation, verify that work is complete, properly installed and acceptable. Remove and replace all work not found acceptable to the owner at the installer's expense.

END OF SECTION

SECTION 09 68 13 - TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 SUMMARY

- A. This section includes all labor & materials as required for complete installation of the following:
 - 1. Tufted carpet tile - See Room Finish schedule for carpet.
 - 2. Transition Strip of rubber or vinyl trim piece between vertical and horizontal & edge changes.
- B. Limited existing flooring has been removed by Asbestos Abatement Contractor outside of this contract.
- C. Provide leveling agent and filler patch on all floors as needed for leveling prior to new flooring installation.
- D. VISUAL INSPECTION REQUIRED PRIOR TO BIDS - Contractor shall be responsible for visually inspecting all existing floor areas scheduled to receive new flooring prior to bid date and include in bid the cost of all preparatory work for a uniform looking, top quality flooring installation.
- E. Related sections:
 - 1. Section 09 65 13 "Resilient Base & Accessories"

1.3 BIDDING REQUIREMENTS

- A. Prior to Bids, the contractor shall decide to his satisfaction that all the drawings and specifications are workable as specified, that there is nothing that would deter the contractor's required warranty, and that no existing conditions at the site prevent the contractor from performing the job in a professional and safe manner. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.4 SUBMITTALS

- A. Manufacturer's Data - Submit two (2) copies of manufacturer's specifications and installation instructions for carpet tile and related items specified.
- B. Fiber and backing verification - Certification from the producer verifying use of the branded fiber and backing in the submitted carpet product. Certification should include the % recycled content by weight for fiber and backing, describing the source of this recycled content. If virgin nylon or backing is used, the manufacturer shall include as part of the fiber and backing certification, the precise method that will be used to recapture the nylon and backing at the end of the useful life of the carpet tile. State how it will be returned to carpet production, fiber into fiber and backing into backing. Fiber types shall not be mixed to facilitate future recycling.
- C. Shop Drawings - Submit shop drawings for areas to be carpeted showing installation of carpeting, seam diagram, pattern direction, necessary installation accessories, and provisions for work of other trades. Show location of different patterns or styles of carpet. Also, show locations of any threshold conditions.
 - 1. The construction manager will supply reproducible prints on request, to facilitate shop drawing preparation.
- D. Samples - Submit standard size carpet samples of each type of carpet, in each specified pattern, color and construction.
 - 1. Any alternates to specified products must be submitted to Architect for approval by a representative of the end user at least ten (7) working days prior to bids..
 - 2. Final Sample Submittal - Submit two (2) sets of samples for each carpet type.

3. No carpet shipments are permitted until acceptance of final samples by representative of the end user or architect/design firm, certifying that samples are the approved color, pattern, and texture.
 4. Custom Color Only - Quality color samples shall be signed by a representative of the end user or architect/design firm, certifying that samples are the approved color, pattern, and texture.
 5. Samples submitted will be assumed to be the manufacturer's best obtainable match to the carpet described under Materials section.
- E. Maintenance Instructions - Submit to the Construction Manager two (2) copies of the manufacturer's carpet maintenance instructions, including information needed for the removal of common stains from each type of carpet required.
1. A representative from the carpet manufacturer shall meet with the Construction Manager in the presence of a representative of the User Agency and architect firm to review the recommended procedures, prior to occupancy of the finished spaces.
- G. Spare Tiles: provide 12 extra tiles of each field color and 2 extra tiles of each accent solid color to User Agency in properly labeled boxes.

1.5 QUALITY ASSURANCE

- A. Manufacturer - Carpet manufacturer shall have no less than three years of production experience with recyclable carpet tile (fiber to fiber and backing to backing) similar to type specified in this document; and whose published product literature clearly indicates compliance of products with requirements of this section.
- B. Trade Contractor - firm with not less than five years of successful carpet tile experience similar to work of this Section and recommended and approved by the carpet manufacturer. Upon request, submit letter from carpet manufacturer stating certification qualifications and acceptance of all environmental requirements.
- C. Substitutes - Where a selected manufacturer or product has been specified, an equal or superior product must be submitted to the Architect no less than (7) working days prior to bids. Product may be accepted only upon review of data & sample tile and written acceptance by the architect. It is mandatory that such review and approval be obtained prior to bidding, or the substitution will not be considered. All such proposed substitutions shall be submitted to the architect with appropriate manufacturer's specifications, literature, environmental compliance assurance, independent laboratory testing data and sample of carpet. The architect's decision as to whether a product is equal or superior to the one specified shall be final. This section applies to any "or equal" noted in the specification.

1.6 PRODUCT DELIVERY AND STORAGE

- A. Deliver carpeting materials in sealed protective packaging for carpet tile and sealed containers for related materials. Carpet materials shall be bound with secure protective wrapping. Consideration should be given to bulk packaging of carpet tile when delivery is made to the jobsite for immediate installation to reduce packaging waste.
- B. Storage and staging area at the site must be coordinated with the Construction Manager.
- C. Materials shall be stored in an enclosed and dry area protected from damage and soiling.

1.7 PRE-INSTALLATION MEETING

- A. The manufacturer shall meet at the project site with representatives of end user, Construction Manager and the Trade Contractor to review the carpet installation procedure and coordination with other trades. The Trade Contractor must have available at this meeting the carpet manufacturer's installation procedures, instructions for the carpet types specified in the various applications required.
- B. Store carpet in working areas which have been enclosed and have maintained environmental conditions as those planned for occupancy. Carpet shall be allowed to reach room temperature or minimum temperature recommended by manufacturer before installation.

1.8 WARRANTY

- A. Provide warranties by Carpet Manufacturer and Trade Contractor agreeing to replace defective materials and workmanship of carpet work during one (1) year warranty period following substantial completion. Also, submit carpet manufacturer's warranties as follows:
 - 1. Wear - Surface wear shall not be more than 10% by weight throughout the life of the product.
 - 2. Static - Carpet will maintain static generation at less than 3.5 KV at 70 degrees F, and 20% R.H. throughout the life of the product.
 - 3. No delamination throughout the life of the product.
 - 4. No edge ravels throughout the life of the product.
 - 5. No dimensional instability, i.e. shrinkage, curling, and doming which adversely affect the ability of the tile to lay flat throughout the life of the product (per installation instructions). See Aachen test.
 - 6. Colorfastness Warranties: Lifetime Colorfastness to Light, Lifetime Colorfastness to Atmospheric Contaminants for 100% solution dyed nylon products.
 - 7. Stain Removal: Lifetime Stain Removal Limited Guarantee
- B. Submit manufacturer's certified independent test results to show that carpet meets or exceeds product performance specification criteria for carpet testing requirements (i.e. see section 2.3 flame, smoke, Aachen test, etc.).
- C. Lifetime Commercial Limited Warranty - Owner will be completely satisfied with the performance of the carpet product when installed in accordance with the manufacturer's current installation specifications and is maintained in accordance with the current carpet care recommendations and such maintenance continues throughout the duration of the original installation when owned and maintained by the original end user.

PART 2 - PRODUCTS

2.1 MANUFACTURER –

Prior Approved Equal in accordance with Section 01 25 00 will require actual samples of carpet.

2.2 CARPET TILE – Equal to products indicated on sheet FL 1.1

2.3 MINIMUM CONSTRUCTION STANDARDS IN ADDITION TO PRODUCT SPECIFICATIONS

- A. Nylon Specification - All nylon fiber shall be branded nylon containing pre-consumer recycled content.
- B. Carpet average density shall be 9,300 minimum. Average pile thickness as determined by ASTM D418.
- C. Appearance Retention Rating (see performance standards)
- D. Antimicrobial with broad spectrum efficacy against bacteria and fungus for the life of the product (see product specification). Minimizes likelihood of Building Related Illness, Sick Building Syndrome, and assists in improving Indoor Air Quality.

2.4 RELATED CARPET MATERIALS

- A. Leveling Compound - Latex type as recommended by carpet manufacturer and is compatible with carpet adhesive and curing/sealing compound on concrete.
- B. Releasable pressure sensitive type adhesive - Use the following as recommended by the carpet manufacturer which will allow removal of carpet at any time without damage or adherence to carpet: N5000 low VOC (no solvents) carpet tile adhesive.
- C. Adhesive –Release Type as recommended by carpet manufacturer which complies with flammability requirements. Note: Adhesive on the ground floor shall be water resistant type as recommended by manufacturer because it is believed that the 50 year old plastic vapor barrier sheet membrane has deteriorated. Note: Modular carpet connectors, pressure sensitive tile pads or dots are acceptable but installer must use adequate number to keep carpet tile from sliding under seating and stair (tread & riser) . If pads or dots are used, installer shall provide additional pads or dots to all areas with seating.

- D. Carpet Edge Guard, Nonmetallic - Extruded or molded heavy duty vinyl or rubber carpet edge guard of size and profile indicated and with minimum 2 inch wide anchorage flange; colors selected by architect/designer from among standard colors available within the industry. **Use ample adhesive for good adhesion to substrate.**
- E. Miscellaneous Materials - As recommended by manufacturer of carpet, cushion and other carpeting products and selected by Trade Contractor to meet project circumstance and requirements.

PART 3 - EXECUTION

3.1 PRE-INSTALLATION REQUIREMENTS AND PREPARATORY WORK

- A. The Trade Contractor shall measure carefully and check all dimensions and other conditions in the field to insure proper fit in the areas designated. Trade Contractor shall be totally responsible for the accuracy of his measurements on total yardage requirements, individual floor yardage requirements and dye lot yardage requirements. No request for carpet or installation extras from the owner will be considered due to measurement or takeoff errors by the Trade Contractor. The Trade Contractor shall confirm total yardage required, including spare tiles along with bid.
- B. The Contractor shall review all conditions at time of installation and prepare as necessary for a flawless job. Install floor leveling compound and crack suppression membrane as needed prior to carpet installation.
- C. Sequence carpeting with other work so as to minimize possibility of damage and soiling of carpet during remainder of construction period. Carpet installation must not commence until painting and finishing work is complete and ceiling and other overhead work has been tested, approved and completed, unless specifically approved by owner's Project Manager, in writing.
- D. Trade Contractor and manufacturer's representative must examine substrates for conditions over which carpeting is to be installed **PRIOR TO INSTALLATION**
 1. New concrete (including concrete patch) shall be allowed to cure for ninety (90) days before carpet installation.
 2. Bond and Moisture Test shall be performed in compliance with ASTM D 4263-93, Standard Test Method for indication of Moisture in Concrete by Plastic Sheet Method after room temperature and humidity reached design conditions. Trade Contractor shall perform moisture content testing as required in manufacturer's instructions to ensure pH readings of no more than 9. Moisture transmission of 5.5 pounds per sq. meter per 24 hours is acceptable. If values exceed this level manufacturer's recommendations must be followed for moisture transmission mitigation. Do not proceed until bond and moisture testing has been done to assure that moisture levels and alkalinity are acceptable levels to the manufacturer of carpet & adhesive. Testing technician shall be certified by the Academy of Flooring and Textiles. Provide Test Results to the Architect.
 3. Cracks 1/16 inch or more, holes, unevenness and roughness must be filled, leveled and made smooth with a compatible latex floor patching compound. Prior to filling, the floor must be swept clean of all loose granular debris. After filling, allow filler to dry. Then damp mop the floor with warm water and allow drying. Vacuum after mopping, to ensure all loose granular debris is removed and provide a proper substrate to install carpet.
- F. All surfaces to receive carpet shall be clean and dry, and in a condition satisfactory to the Trade Contractor. Trade Contractor shall notify Construction Manager in writing of any conditions which will prevent him from producing satisfactory finish work after above specified preparatory work is completed.
- G. Trade Contractor shall vacuum floors again immediately before installation of carpeting.
- H. Confirm compatibility of adhesive with curing compounds on concrete floors. All adhesives and curing compounds shall comply with the CRI Green Label Certification program for low VOC.
- I. Environmental Conditions - Areas to be carpeted must be pre-heated at a minimum of 68° F. for 72 hours prior to installation with the relative humidity not more than 65%. A minimum temperature of 50° F. shall be maintained thereafter. Carpet and adhesive must be stored at a minimum temperature of 68° F. for 72 hours prior to installation.

- J. Once the Trade Contractor commences installation work under this contract, it shall be assumed that the condition of the floor has been accepted and any repairs or further corrections in the floor surface shall become the responsibility of the Trade Contractor.

3.2 INSTALLATION

A. General

1. Comply with manufacturer's instructions and recommendations for uniformity of direction of carpet installation.
2. Install carpet under open-bottom obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.
3. Provide cut outs where required. Conceal cut edges with protective edge guards or overlapping flanges.
4. Run carpet under open-bottom items such as heating convectors and install tight against walls, columns and cabinets so that the entire floor area is covered with carpet. Cover over all floor type door closures.
5. Install edging guard at all openings and doors wherever carpet terminates, unless indicated otherwise. Prior to installation, report to the Construction Manager all other obstructions which may occur.
6. Cutting shall be done in accordance with the manufacturer's recommendation, using the tools designed for the carpet being installed.
7. Edges shall be butted together with the proper pressure to produce the tightest joint possible without distortion.
8. All carpet shall be installed with pile-lay in the same direction except when directed to use a quarter turned method as specified in the drawings.
9. Use leveling compound where necessary. Any floor filling or leveling shall have a minimum of 4'0" of feather.
10. Expansion joints - Do not bridge building expansion joints with continuous carpeting. Provide for movements.

B. Installation

1. Install carpet according to carpet manufacturer's printed instructions.
2. Measuring - Divide the room into four quadrants and snap a chalk line. Make sure quadrants meet at right angles (offset the center line, if necessary, to ensure that perimeter tiles will be cut no less than half size (9 inches).
3. Apply environmentally approved adhesive as per instructions in the area to be carpeted first.
4. Note carefully if the product is designed to be installed "quarter turned" only. Arrows should point in the same direction every other tile and diagonally. Arrows on alternating tiles should be turned 90° in either direction, consistently.
5. Begin installing by laying an anchor row of tiles on one side of the center chalk line. Ensure straight lines and square corners. Repeat anchor rows in each quadrant, extending out from center. Fill in each quadrant with tiles using a stair step technique.
6. Tip individual tiles into place to avoid catching pile in the joint. Frequently check tile joints for proper alignment and firm abutment.
7. Although tiles are nominally 24 inches by 24 inches square, there will be slight gain due to joints. To check, measure 10 installed tiles from edge to edge, spanning 10 joints. This measurement should be no greater than 240 and 1/8 inches for tufted product. If more gain is measured, tiles are not butted tightly enough. Reposition and check again. Use this method to continually check for excessive gain. See manufacturer's instructions for 24" x 24" modular tiles.
8. Fixtures, architectural elements, and perimeters will require tile cutting. Cut tiles from the back. Secure cut or partial tiles with adhesive.
9. Electrical floor outlets are usually wired after tile installation. Install tile over electrical boxes and mark locations with a piece of tape. Tiles can be lifted for cut-outs later.
10. Center trench headers directly under a full tile row.
11. In open perimeter designs, use a fixed reducer strip to secure the tile area.

3.4 CLEANING AND PROTECTION

- A. On completion of the installation in each area, all dirt, carpet scraps, etc., must be removed from the surface of the carpet. Any soiling spots or excessive adhesive on the carpet shall be removed with the proper spot remover. (See Section 1.3.7)
- B. Construction traffic other than as may be required to fit up specific carpeted area will not be allowed to traverse the completed work.
- C. Protect carpeting against damage during construction. Cover with 6-mil thick polyethylene covering with taped joints during the construction period, wherever protection is required, so that carpet will be without any indication of deterioration, wear, or damage at the time of acceptance. Damaged carpeting will be rejected.
- D. At the completion of the work and when directed by the Construction Manager, vacuum carpet using commercial dual motor vacuum of type recommended by carpet manufacturer. Remove spots and replace carpet where spots cannot be removed. Remove rejected carpeting and replace with new carpeting. Remove any protruding yarns with shears or sharp scissors.
- E. Protection of carpeting shall be maintained on each floor or area until accepted.

3.5 INSPECTION

- A. Preliminary Acceptance - Upon completion of the carpet installation of each floor, it shall be inspected by Owner, the Construction Manager and Trade Contractor.
- B. Upon completion of the installation, verify that work is complete, properly installed and acceptable. Remove and replace all work not found acceptable to the owner at the installer's expense.

END OF SECTION

SECTION 09 70 00 - CUSTOM DIGITAL WALLCOVERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Related Sections include the following:
1. Section 09 90 00 Painting

1.3 SUMMARY

- A. Section includes: wallpaper with images of custom photographs provided by the Architect
1. All labor/material/graphics/etc included for complete installation of wall paper from floor to ceiling on the walls indicated on Sheet A6.1.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
1. E 84-91a - Test Method for Surface Burning Characteristics of Building Materials. Tested on re-enforced cement board.
 2. G 21-90 - Recommended Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- B. Chemical Fabrics and Film Association (CFFA):
1. CFFA - W- 101-B - Quality Standard for Vinyl Coated Fabric Wallcovering.
- C. Federal Specifications (FedSpec):
1. CCC-T-191b
- D. New York State 1006 Quantitative Bacterial Resistance
- E. State of Washington, Department of General Administration Indoor Air Quality Product chase Specification
- F. EPA Headquarters New Product Procurement Emission Testing Requirement
- G. EPA Pesticide Regulations, 40 C.F.R. 152.25

1.03 SUBMITTALS

- A. Samples to be submitted by manufacturer directly to Architect/Designer of all materials specified, in accordance with Section 1.03C. Do not order materials until approval is received.
1. Submit "mini-mural" of complete finished image printed on actual substrate specified.
 2. Submit sample section of final image at 100% resolution printed on actual substrate specified.
- B. Manufacturer's Data: For each type of digital wallcovering proposed for use on the project, submit certified copies of reports of tests specified, together with complete description of each wallcovering, including: pattern, total weight, fabric backing, tensile strength, tear strength, and fire hazard classification.

1.04 QUALITY ASSURANCE

- A. Submittals other than the specified material shall match the appearance and color of the selected material, and equal or exceed the quality, total weight,

- fabric backing, tensile and tear strength, fire ratings and mildew resistance of the specified product(s). The decision of the Architect/Designer shall be final.
- B. Imperfections such as engraving roller die marks, roller repeat marks or other features deemed not in conformance with the specified materials, will be cause for rejection by the Architect/Designer, if evidenced in either the submitted samples, or the manufactured material delivered to the job.
- C. Tests: All tests shall be performed in accordance with Federal Specification CCC-T-191b, except as follows: Adhesion of vinyl coating to the fabric backing shall be tested in accordance with ASTM D 751.
2. Materials shall have a zone inhibition rating of "0" on face, and "1" on backing to resist the growth of mildew and bacteria, as determined by test method ASTM G 21.
- D. Applicators Qualifications: Work of this section shall be performed by a firm regularly engaged in the installation of vinyl wallcoverings of the types and qualities specified, and acceptable to the Architect/Designer.

1.05 PROJECT SITE CONDITIONS

- A. Temperatures
1. Maintain substrate surface and ambient temperatures above 65 degrees F, unless required otherwise by manufacturer's instructions.
 2. Do not apply adhesive when substrate surface temperature or ambient temperature is below 65 degrees F.
 3. Maintain these conditions 72 hours before, during, and after installation of vinyl wallcovering.
- B. Lighting: Provide not less than 80 foot-candles per square foot minimum, on the surfaces to receive wallcoverings.
- C. Wall Condition
1. The wall surface should be clean, dry, structurally sound, and free of mildew, grease, dust, or
 2. Old wallcovering and old adhesive should be completely removed from the wall.
 3. Plaster and masonry wall surfaces should not exceed 5.5% moisture when measured by a moisture meter. Gypsum board wall surfaces should not exceed 16% moisture.
 4. Room humidity should not exceed 90%.
 5. Wall surfaces should be primed with a good quality wallcovering primer. Wall surfaces with significant color variation should be primed with a good quality pigmented wallcovering primer.
 6. New plaster should age 60-90 days before painting or installing wallcovering.

1.06 WARRANTY

- A. Submit manufacturer's written five year warranty against manufacturing defects.
1. All wallcovering materials when adhered to a sound surface with the manufacturer's recommended procedures and adhesive, shall be warranted free of manufacturing defects for a period of 5 years from the date of acceptance of the project.
 2. Assuming no deterioration in the subsurface, if such manufacturing defects are claimed in writing during the warranty period, and proper documentation is presented to the manufacturer with regard to date of

sale, plus adhesive used and surface applied to, the manufacturer, as its option, will either replace the vinyl wallcovering or refund the purchase price.

3. The foregoing limited warranty is in lieu of all other warranties, expressed or implied, written or oral.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Custom Digital Wallcovering as provided by MDC Wallcoverings or Wallsource.

Digital wallcovering shall be printed on 53"/54" vinyl wallcovering substrate using piezo drop-on-demand technology incorporating eight colors, CYMK and half density CYMK. Printed image shall be dried from both front and back using combinations of IR and platen heaters to prevent media distortion.

B. Vinyl wallcovering substrate: supported vinyl material, consisting of a through-pigmented, mildewinhibitorized polyvinyl chloride, adhered to cotton, cotton/blend fabric backing, or a cellulose polyester nonwoven backing. All materials shall be Cadmium and Mercury free, and shall conform to the CFFA-W-101-B, using test methods as outlined in FedSpec CCC-T-191b, except as otherwise specified.

1. Total Weight: minimum 13 ounces per square yard, 19.5 ounces per linear yard.
2. Backing Weight: minimum 2 ounces per square yard.
3. Fabric backing and content: cotton, cotton/blend fabric, or a cellulose polyester non-woven.
4. Adhesion of coating to fabric: 3 pounds per 1 inch strip (ASTM D751)
5. Tensile strength: 97 X 92 (W x F).
6. Tear strength: 55 X 40 (W x F).
7. Flame Spread (UL): 10 (ASTM E84) or UL 723.
Smoke Developed (UL): 25 (ASTM E84) or UL 723
Tested on reinforced cement board.
8. Mildew resistance: Zone inhibition rating of "0" on face, "1" on backing (ASTM G21).
9. Staphylococcus resistance: 100 percent reduction within 24 hours.
1006 NYS Quantitative Bacteria Resistance
10. Accepted by the City of New York Department of Building MEA 310-89-M.
11. Meet the State of Washington Purchase Specification for Product Emissions (Formaldehyde and TVOC's) 7 days after installation.
12. Meet the EPA Headquarters Procurement specification for Product Emission (Total Aldehydes) within 7 days.
13. Product registered with the State of California Department of Forestry and Fire Protection Building Materials Listing Program.
14. Meets Heavy Metal Solubility Requirements of ASTM F-963.
15. Contains bactericides and mildew inhibitors to protect the product from microbiological and mildew growth, consistent with 40 C.F. R.β152.25.
16. Provide the benefit of advanced notice of smoke or fire when used in conjunction with ionized smoke detectors.

C. Adhesive: Heavy Duty Clay or Heavy Duty Clear or brands approved as equals by the manufacturer.

PART 3 - EXECUTION**3.01 INSTALLATION**

- A. Contractor shall examine surface for any imperfections, if found bring to the attention of the general contractor.
- B. Install digital wallcovering in accordance with the manufacturer's instructions using heavy-duty vinyl wallcovering adhesive recommended by the manufacturer (Wheat paste shall not be used).
- C. Before cutting, lay out panels in numeric order and examine each panel for color consistency, accuracy and proper image dimension.
- D. Install each panel in numerical sequence hanging first panel to a vertical line. Overlap subsequent panels to match crop lines and double cut on the wall. Selvage (excess trimmed edge) should be removed from the wall and the seam closed within one hour.
- E. Re-inspect after the application each panel. Request inspection by the Architect/Designer if there are variations in color or pattern that are considered to be excessive. The wallcovering distributor or manufacturer's representative shall then be notified for their inspection, before any further wallcovering is installed.
- G. The wallcovering shall be smoothed to the hanging surface, using a stiff bristled sweep brush or a flexible broad-knife to eliminate air bubbles.
- H. Remove excess adhesive along finished seams immediately after each wallcovering strip is applied. Use clean warm water, a natural sponge and clean towels. Change water often to maintain water cleanliness.

3.02 CLEAN-UP COMPLETION

- A. Upon completion of the work, remove surplus materials, rubbish and debris resulting from the wallcovering installation. Leave areas in neat, clean and orderly condition.

END

SECTION 09 77 00 - FIBERGLASS REINFORCED PLASTIC PANELS

PART 1 - GENERAL

1.1 GENERAL CONDITIONS

The provisions of the General Conditions of the Contract for Construction are hereby made a part of this Section.

1.2 SCOPE OF WORK

Provide all material and installation of Prefinished polyester glass reinforced plastic sheets that are adhered to unfinished plywood wallboard. Complete system with all accessories for a professional installation.

1.3 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.1 PRODUCT

- A. The wall and/or ceiling panels shall be Glasbord-P fiberglass reinforced plastic panels with Surfaseal by Kemlite Company Inc., Joliet, Illinois, 800-435-0080; Glasteel, Inc., Collierville, Tennessee, 800-238-5546; or approved equal.
- B. Panel thickness to be 0.090". Width 4'-0" & 9'-0" length.
- C. Color shall be selected by architect from standard color chart.
- D. Accessories shall include outside corner, inside corner, capping strip, and division bar.
- E. Panels shall have normal water absorption property of 0.08%.
- F. Panels shall have an expansion coefficient not to exceed 1.7×10^{-5} in./in./EF.
- G. Panels shall meet flame spread and smoke development ratings specified for Class A (I) interior finish under the indicative operative code.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation shall be in accordance with manufacturer's written instructions.
- B. Secure to wall substrate with adhesive as recommended by manuf.
- C. Install above base material.

END

SECTION 09 84 00 - ACOUSTICAL WALL TREATMENT**PART 1 - GENERAL**

1.01 GENERAL CONDITIONS

- A. The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.02 SCOPE: All labor & materials as required for complete installation of Acoustic Wall Treatment as follows:

- A. See Plans.
- B. Provide all materials for a complete wall treatment system.

1.03 REFERENCES

- A. ASTM C423-81a, Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- B. ASTM E-84-81a, Surface Burning Characteristics of Building Materials.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site, store and protect under provisions of Section 01 60 00.

1.05 SUBMITTALS

- A. Shop Drawings: Submit shop drawings with product data, appropriate details indicating field dimensions, panel layout, and installation & anchoring methods. Manufacturer shall provide panel layout for optimum performance based on their recommendations using the number of panels indicated on the plan.
- B. Product Data: Submit manufacturer's product data including specifications, installation instructions, test data, maintenance, and warranty information.
- C. Samples: Submit one sample (12" x 12") of each type of acoustical panel color as shown on the drawings and schedule.
- D. Samples: If no colors are selected on the plans, provide color selection swatch of complete color line for selection.

1.6 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.01 MANUFACTURER'S

- A. The following Acoustical Products/Manufacturers are approved subject to compliance with the specifications:
 1. Armstrong Industries. Soundsoak Custom Panel. www.armstrong.com - Basis of Design. The following are approved as equals:
 2. Acoustical Resources, Inc. Impact Resistant www.acousticalresources.com
 3. AVL Systems, Inc. ATP 1.1Fabric High Impact Panel. www.avlonline.com
 4. Kinetics Noise Control Inc. High Impact Hardside Panel www.Kineticsnoise.com
 5. Conwed Designscape. Respond High Impact Acoustical Panels www.conweddesignscape
 6. Approved Equal in accordance with Section 01 25 00. Panels shall not be painted in the Field.
- C.1 Impact Resistant / Tackable Series Acoustical Panels shall be constructed of a single core construction of dimensionally stable rigid fiberglass of medium density (6-7 PCF). Thickness 1" that is laminated to an 1/8" high density, smooth, glass fiber face (16-20 PCF).
- C.2 Panel Sizes: as shown on drawings. Panels are to be manufactured according to field dimensions supplied by the installing contractor. Standard tolerances are $\pm 1/16$ " in width and length.

- C.3** Panel Edge Profile for Individual Panels shall be: Half Radius. Edge Treatment shall be: chemically hardened.
- C.5** Panel Finish: Panel finish shall be selected from standard colors of 100% woven polyester fabric Architect to select color from full range of available colors. Finish shall be applied directly to the face and edges of the panel and returned to the back of the panel to provide a full finished edge. All corners are fully tailored.
- C.6** Panel Mounting shall be mechanical z-clip, hook & loop on inside face of exterior walls, or adhesive on interior walls. Maintain 1/4" air space between panel and gypsum board on exterior walls for breathability. Adhesive or other incidental materials are to be supplied by the installing contractor.
- C.7** Acoustical Performance: Wall panels shall have a minimum Noise Reduction Coefficient (NRC) of $1 \frac{1}{8} = .85$, in accordance with ASTM C-423-81a, Sound Absorption & Sound Absorption Coefficients by the Reverberation Room Method.
- C.8** Flammability: All components utilized in the construction of the wall panels shall have a Class "I" (0-25) rating in accordance with ASTM E-84-81a, Surface Burning characteristics of Building Materials.

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Installation of acoustical panels shall not begin until all wet work (plastering, concrete, etc.) is completed and dry. Building shall be properly enclosed and under standard occupancy conditions (temperature of 60-85 degrees F. and not more than 80% relative humidity) before installation begins.
- B. The contractor shall be responsible for the examination and acceptance of all surfaces and conditions prior to the acoustical panel installation.
- C. Review the plans by other trades and consult with the General Contractor for coordination of all trades that have wall mounted equipment. Provide all cut outs in panels for receptacles, light switches, all wall mounted devices, etc.

3.02 INSTALLATION, GENERAL

- A. Acoustical panels shall be installed according to manufacturer's recommendations and instructions.

END OF SECTION

SECTION 09 90 00 - PAINTING**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 RELATED SECTIONS

- A. Related sections include:
1. Section 04 20 00 "CMU"
 2. Division 5 Section for Shop Priming of prime coat of lintels, steel, etc.
 3. Section 08 11 13 Hollow Metal Frames for prime coat.
- B. Unless otherwise specified, shop priming of ferrous metal items is included under the various sections for structural steel, miscellaneous metal, hollow metal work, and similar items.
- C. Site verification of existing painted materials is required prior to Bids so that the contractor can estimate the preparation needed for the new paint to properly adhere to existing materials.

1.3 SUMMARY:

- A. The work includes all labor & material as needed for complete painting and finishing of all interior and exterior building surfaces exposed to view and not noted as pre-finished throughout the project and as noted below:
1. Surface preparation, priming and coats of paint specified are in additions to shop-priming and surface treatment specified under other sections of the work.
 2. Interior non finished metals
 3. Parking Striping & Markings
 4. Interior concrete masonry unit wall surfaces and partitions.
 5. Doors and frames.(Enamel Gloss) Exterior face shall be high performance paint.
 6. Metal railings, lintels, bollards, pipe columns.
 7. Interior gypsum board, gypsum board ceilings or plywood if scheduled.
 8. Exposed screw heads in millwork.
 9. Stenciled lettering markings on both sides of all new rated walls per IBC.
 10. Site Verification prior to bids is required to learn of existing materials, paint types and prep work needed to include in Bid for good appearance & adhesion.
 11. All new visible conduit, panels, wire, pipe, brackets, on interior walls & open ceiling areas.
 12. Paint all exposed gas piping on Roof traffic yellow.
 13. All Existing wood trim that remains to be lightly sanded and re-coated with clear polyurethane sealer. (verify latex or oil).
 14. 2 coats of clear water based polyurethane sealer over face only of Acoustic Wood Slat wall panels shown on Sheet A6.1 and Section 10 10 00.
- B. The work excludes painting on prefinished items, finished metal surfaces, operating parts, labels and concealed surfaces unless otherwise noted. Exposed plumbing piping, HVAC ductwork, and electrical conduit is required to be painted.
1. Prefinished items not to be painted include the following factory-finished components: acoustic materials, architectural woodwork and casework, finished mechanical and electrical equipment, light fixtures, switchgear and distribution cabinets.
 2. Concealed surfaces not to be painted include wall or ceiling surfaces in the following generally inaccessible areas: foundation spaces, furred areas, pipe areas and duct shafts.
 3. Finished metal surfaces not to be painted include: anodized aluminum, stainless steel, copper and bronze.
- C. SCOPE:
1. See Plans & this Section.

D. Include all items necessary for the completion of work whether or not they are shown in the documents.

1.4 BIDDING REQUIREMENTS

A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.5 REFERENCE

- A. Code of Federal Regulations
1. 40 CFR, Part 59, Subpart D-2001: National Volatile Organic Compound Emission Standards for Architectural Coatings (EPA Method 24)
- B. Green Seal, Inc. Publications:
1. GS-11 "Green Seal Environmental Standard for Paints", First Edition 1993.

1.6 SUBMITTALS

- A. Samples, Painting:
1. Submit samples for Architect's review of color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor. Provide a listing of the material and application for each coat of each finish samples.
 2. On Painted Gypsum Board: Provide two 12" x 12" samples of each color and material, with texture to simulate actual conditions. Resubmit samples as requested by Architect until acceptable sheen, color and texture is achieved.
 3. On Actual Wood Surfaces: Provide two 4" x 8" samples of natural painted and stained wood finish. Label and identify each as to location and application.
 4. On Concrete Masonry: Provide two 4" square samples of masonry for each type of finish and color, defining filler, prime and finish coat.
 5. Prior to final painting provide 2' X 2' brush-out on wall to receive finish to be reviewed in the final project lighting.
- B. Painting Schedule: In a form similar to the schedule herein outlining the type of paint to be used for each category, application, and color. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
- C. Certifications: Manufacturer's statement that paint materials conform to current regulations relating to lead content and air pollution emission requirements.
- D. VOC content of all products.

Prior to Shop Drawing Submittal and beginning paintwork, Paint Supplier shall confirm that proposed Paint type is suitable for the intended purpose. Site Verify installed materials and discuss with Architect and adjust as necessary for proper adhesion & maintenance.

1.7 DELIVERY AND STORAGE

A. Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturer's name, label, thinning instructions, VOC content, color name & number and application instructions.

1.8 JOB CONDITIONS

- A. Apply water-base paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50°F and 90°F unless otherwise permitted by the paint manufacturer's printed instructions. Do not apply paint in the rain, fog, mist or when relative humidity is above 85%.
- B. Include in Bid, cost to make 4 "10' x 10' color mock ups" for each Department to select from. Mock up selected can remain on the wall. Others will need to be covered with the selected paint.

1.9 RATED WALLS

- A. On each side of rated wall, (fire or smoke rated walls) label these walls above ceiling with 2 inch high letters reading "FIRE WALL,(SMOKE WALL) DO NOT PENETRATE" on each side of firewall at 6'-0" o.c. Confirm acceptance of wording with the authority having jurisdiction prior to installation.

1.10 WASTE MANAGEMENT AND DISPOSAL

- A. Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.) are regarded as hazardous products and are subject to regulations for disposal. Obtain information on these controls from applicable government agencies having jurisdiction.
- B. Set aside and protect surplus and uncontaminated finish materials not required by the Owner and deliver or arrange collection for verifiable re-use or re-manufacturing.

1.11 VOC CONTENT REQUIREMENTS

- A. VOC content shall be determined according to and comply with the following limits requirements:
Architectural Paints, coatings and primers applied to interior walls and ceilings Green Standard GS-11.
- B. Clear wood finishes, floor coatings, stains, sealers and shellacs: SCAQMD Rule 1113.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- | | |
|---------------------|----------|
| 1. Sherwin Williams | 2. PPG |
| 3. Benjamin Moore | 4. Devco |
| 5. Glidden | 6. ICI |
| 7. Approved equal. | |

2.2 PAINTING MATERIALS

- A. Primers, Sealers, Fillers, and special coatings shall be of the highest quality manufactured by approved coating manufacturers.
- B. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- C. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated.
 - 1. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
 - a. Interior paint: Recycled content paints and primers will not be permitted for interior application.
 - b. Toxicity/IEQ: Comply with applicable regulations regarding toxic and hazardous materials, and as specified. Paints and coatings must meet or exceed the VOC and chemical component limits of Green Seal requirements and shall comply with Green Seal GS-11.
 - c. Chemical Components of Interior Paints and Coatings: Provide products that comply with the scheduled limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.3 PROTECTIVE COATINGS

- A. Bituminous Paint: Acid and alkali resistant type conforming to ASTM D1187.
- B. Zinc Chromate Primer: Standard zinc chromate primer, selected from manufacturers listed in this Section.
- C. Aluminum Pigmented Paint: Fibrated aluminum complying with ASTM D2824, Type IV. D. Apply protective coating, bituminous paint, to isolate aluminum member as required.

2.4 PAINTING SCHEDULE

- A. INTERIOR METAL-LATEX FINISH:
 - 1. All metal shall be primed & painted as follows:
 - 2. Metal that has been factory primed such as structural steel, hollow metal doors and frames, etc. shall be touched up after erection. All welds, abrasions, cuts, etc., shall be touched up and primed.
 - 3. 1 Primer Coat: Acrylic Latex Max VOC content 250 g/L)
 - a. Sherwin Williams Pro Industrial Pro-Cryl Universal Primer, 3 Dry Mill Thickness
 - b. Benjamin Moore Acrylic Metal Primer, 1.5 Dry Mill Thickness

- c. Equal Product by Approved Manufactures listed in Article 2.1
 - d. Approved Equal.
 - 4. 2 Finish Coats: Acrylic Latex Semi-Gloss (Max VOC content 150 g/L)
 - a. Sherwin Williams Pro Classic Waterborne Acrylic Semi-Gloss B31 Series, 1.3 Dry Mill Thickness per coat
 - b. Benjamin Moore Eco Spec Interior Latex Semi Gloss Enamel , 1.4 Dry Mill Thickness per coat.
 - c. Equal Product by Approved Manufactures listed in Article 2.1
 - d. Approved Equal.
- B. EXTERIOR METAL – See High Performance Coatings below.
- C. INTERIOR GYPSUM BOARD-ACRYLIC LATEX:
- 1. All walls & ceilings shall be primed & painted as follows:
 - 2. Prepare drywall for painting.
 - 3. 1 Primer Coat: Acrylic Latex (Max VOC content 150 g/L)
 - a. Sherwin Williams Pro Green 200 Interior Latex Primer, 1.5 Dry Mill Thickness
 - b. Benjamin Moore Eco Spec Interior Latex Primer Sealer, 1.0 Dry Mill Thickness
 - c. Equal Product by Approved Manufactures listed in Article 2.1
 - d. Approved Equal.
 - 4. 2 Finish Coats: Acrylic Latex Eggshell (Max VOC content 150 g/L)
 - a. Sherwin Williams Pro Green 200 Interior Latex Egg Shell, 1.7 Dry Mill Thickness per coat
 - b. Benjamin Moore Eco Spec Interior Latex Eggshell enamel, 1.4 Dry Mill Thickness per coat.
 - c. Equal Product by Approved Manufactures listed in Article 2.1
 - d. Approved Equal.
- D. INTERIOR WOODWORK - PAINTED: **Walls shall be eggshell sheen and doors/trim shall be semi-gloss.**
- 1. All woodwork indicated to be painted shall be primed & painted as follows:
 - 2. Prepare woodwork for painting as indicated elsewhere.
 - 3. 1 Primer Coat: Acrylic Latex (Max VOC content 150 g/L)
 - a. Sherwin Williams Harmony Interior Latex Primer, 1.3 Dry Mill Thickness
 - b. Benjamin Moore Aura Semi-Gloss Waterborne Interior Paint 1.5 Dry Mill Thickness
 - c. Equal Product by Approved Manufactures listed in Article 2.1
 - d. Approved Equal.
 - 4. 2 Finish Coats: Acrylic Latex Semi-Gloss (Max VOC content 150 g/L)
 - a. Sherwin Williams Pro Classic Waterborne Acrylic Semi-Gloss, 1.3 Dry Mill Thickness per coat
 - b. Benjamin Moore Aura Semi-Gloss Waterborne Interior Paint 1.5 Dry Mill Thickness per coat.
 - c. Equal Product by Approved Manufactures listed in Article 2.1
 - d. Approved Equal.
- E. INTERIOR FACE OF ALL CMU WALLS WHERE EXPOSED- LATEX / EPOXY FINISH:
- 1. Block Filler - Heavy duty block filler 18 - 34 wet mils.
 - 2. Finish - Two coats of waterbased catalyzed epoxy. 6.5 mils min. dry each coat with Class A Flamespread.
- EXTERIOR FACE OF ALL CMU WALLS – Sherwin Williams Super Paint Exterior Acrylic Latex- installed as recommended in written instructions.
- F. PARKING LANES AND MARKING
- 1. Finish - Two coats of Pro Mar Aklyd Traffic Marking Paint, B29Y2 or Benjamin Moore Super Spec HP Safety & Zone Marking Latex
- G. NON-SLIP CONCRETE SEALER FINISH ON INTERIOR CONCRETE FLOORS

1. Provide skid-resistant floor finish over existing concrete where shown.
2 coats of H&C Clarishield Oil Based Concrete Sealer, acid etch and prep as recommended by manuf. 200 SF per gallon coverage
2. Material Preparation
 - a. Clean new floors and clean existing floors by acid edtching.
 - b. Mix and thin materials according to manufacturer's latest printed instructions.
 - c. Apply as directed by manufacturer.
 - d. Approved Equal by Section 01 25 00.

H. INTUMESCENT PAINT

1. Where indicated on plans or required for protection of foam or wood materials
 2. Prepare surface as recommended by manuf..
 3. 2 Coat over primer.
 - a. Flame Control Coatings No. 20-20A
 - b. Benjamin Moore 220 Latex Fire Retardant Paint
 - c. Equal Product by Approved Manufactures listed in Article 2.1
 - d. Approved Equal.
- I. HIGH PERFORMANCE COATING – For all exterior exposed metal, including metal doors.
All exterior metal work shall receive prime coat with Sherwin Williams DTM Primer; finish coat with Sherwin DTM.

At Walk Drains, add slip resistant additive equal to H & C Sherkgrip to Traffic Yellow color Paint.

- J. TILE CLAD – For coating Ceramic Tile walls & Floors, toilet partitions where indicated on plans, install Sherwin Williams Tile-Clad HS two component Epoxy polyamide Coating as recommended in written instructions.

- K. EPOXY FLOOR PAINT – For coating existing or new concrete floors, use Sherwin Williams Armorseal Tread-Plex, one-component general purpose waterborne floor coating installed as recommended in written instructions. Bead Blast existing painted concrete to ensure good adhesion.

Approved Equals: Other manufacturers subject to compliance with the specifications shall be considered in accordance with Section 01 25 00.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Applicator must examine the areas and conditions under which painting work is to be applied and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Applicator.

Prior to Shop Drawing Submittal and beginning paintwork, Paint Supplier shall confirm that proposed Paint type is suitable for the intended purpose. Site Verify installed materials and discuss with Architect and adjust as necessary for proper adhesion & maintenance.

- B. Starting of painting work will be construed as the Applicator's acceptance of the surfaces and conditions within any particular area.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.
- D. General: Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's

instructions and as herein specified, for each particular substrate condition.

1. Remove all hardware, hardware accessories, machined surfaces, plates lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.
2. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Program the cleaning and painting so that contaminants from the cleaning process will not fall onto wet, newly-painted surfaces.

3.2 CEMENTITIOUS MATERIALS

- A. Prepare cementitious surfaces of concrete, concrete block, cement plaster and cement-asbestos board to be painted by removing all efflorescence, chalk, dust, dirt, grease, oils, and by roughening as required to remove glaze.

3.3 WOOD

- A. Clean wood surfaces to be painted of all dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer, before application of the priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dried.
- B. Prime, stain, or seal wood required to be job-painted immediately upon delivery to job. Prime edges, ends, faces, undersides, and backsides of such wood, including cabinets, counters, cases, paneling, etc.
- C. When transparent finish is required, use spar varnish for backpriming.
- D. Backprime paneling on interior partitions only where masonry, plaster, or other wet wall construction occurs on backside.
- E. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to job.

3.4 FERROUS METALS

- A. Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
- B. Touch-up shop-applied prime coats wherever damaged or bare, where required by other sections of these specifications. Clean and touch-up with the same type shop primer.

3.5 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions.
- B. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density, and stir as required during the application of the materials. Do not stir surface film into the material. Remove the film and if necessary, strain the material before using.

3.6 SURFACE PREPARATION:

- A. Clean and prepare surfaces to be painted in accordance with manufacturer's instructions for each particular substrate condition. Notify Architect in writing of problems anticipated using specified finish coat material with substrates primed by others.
- B. Ferrous Metals: Clean non-galvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
 1. Touch-up shop-applied prime coats that have been damaged, and bare areas. Wire-brush, clean with solvents, and touch-up with the same primer as the shop coat.
 2. At areas to receive epoxy paint, prepare steel surfaces to SSPC-SP11 power tool clean.

- C. Galvanized Surfaces: Utilize SSPC-SP1 solvent cleaning and chemical wash (tri-sodium phosphate). Power wash with tri-sodium phosphate type cleaner (5% solution at 140 degrees F.) and solvent clean after rinsing and drying with a non-petroleum based solvent cleaner so that surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock, by mechanical methods.
 - 1. Touch-up shop-applied prime coats that have been damaged, and bare areas. Wire-brush clean with solvents, and touch-up with the same primer as the shop coat.
- D. Wood Surfaces:
 - 1. General:
 - a. Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - b. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - c. Delete subparagraphs below if these requirements are specified in other Sections.
 - d. Prime, stain or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides and backsides of wood, including cabinets, counters, cases and paneling.
 - e. When transparent finish is required, backprime with spar varnish.
 - f. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
 - g. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

3.7 APPLICATION

- A. Apply paint in accordance with the manufacturer's directions. Use applicators and techniques best suited for the substrate and type of material being applied.
- B. Apply additional coats when undercoats, stains or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
- C. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with prime coat only before final installation of equipment.
- D. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint.
- E. Finish doors on tops, bottoms and side edges the same as the exterior faces, unless otherwise indicated.
- F. Sand lightly between each succeeding enamel or varnish coat.
- G. Omit the first coat (primer) on metal surfaces, which have been shop-primed and touch-up painted, unless otherwise indicated.
- H. Scheduling Painting:
 - 1. Apply the first coat materials to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 - 2. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not defer or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lighting or loss of adhesion of the undercoat.
- I. Minimum Coating Thickness:
 - 1. Apply each material at not less than the manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer and as needed for a consistent, even appearance without streaks or bleed-through from the previous coat.
- J. Prime Coats: Apply a prime coat of material which is required to be painted or finished, and which has not been prime coated by others.
 - 1. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.

- K. Pigmented (Opaque) Finishes:
 - 1. Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfection will not be acceptable.
- L. Completed Work:
 - 1. Match approval samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.6 CLEAN-UP & PROTECTION

- A. Clean-Up:
 - 1. During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.
 - 2. Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- B. Protection:
 - 1. Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to the Architect.
 - 2. Provide "Wet Paint" signs as required to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations.
 - 3. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces.

END OF SECTION

SECTION 09 97 23

MasterProtect® HB 400 Waterproof Coating (Formerly Thorocoat)

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Application of water-based, high-build, 100 percent acrylic, waterproof coating.
- B. Related Sections:
 - 1. Section 04 20 00 – Unit Masonry Assemblies.

1.2 SUBMITTALS

- A. Comply with Section 01 33 00
- B. Product Data: Submit manufacturer's technical data sheets.
- C. LEED Submittals: Comply with requirements for each product to achieve points indicated in LEED Project Checklist provided by the architect/engineer.
- D. Submit list of project references as documented in this specification under Quality Assurance Article. Include contact name and phone number of the person charged with oversight of each project.
- E. Quality Control Submittals:
Provide protection plan of surrounding areas and non-cementitious surfaces.

1.3 QUALITY ASSURANCE

- A. Comply with Section 01 40 00
- B. Qualifications:
 - 1. Manufacturer Qualifications: Company with minimum 15 years of experience in manufacturing of specified products.
 - 2. Manufacturer Qualifications: Company shall be ISO 9001:2000 Certified.
 - 3. Applicator Qualifications: Company with minimum of 5 years' experience in application of specified products on projects of similar size and scope and is acceptable to product manufacturer.
 - a. Successful completion of a minimum of 5 projects of similar size and complexity to specified work.
- C. Field Sample:
 - 1. Install at project site or another pre-selected area of the building, minimum 4 feet by 4 feet (1.2 m by 1.2 m), using specified material.
 - 2. Apply material in accordance with manufacturer's written application instructions.
 - 3. Manufacturer's representative or designated representative will review technical aspects; surface preparation, repair and workmanship.

4. Field sample will be standard for judging workmanship on remainder of project.
5. Maintain field sample during construction for workmanship comparison.
6. Do not alter, move, or destroy field sample until work is completed and approved by architect/engineer.
7. Obtain architect/engineer written approval of field sample before start of material application, including approval of aesthetics, color, texture and appearance.
8. Perform adhesion test in accordance with ASTM D3359, Method A. Minimum adhesion rating of 4A required on 0 to 5 scale.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section [01 60 00] [__ __ __].
- B. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Store tightly sealed materials off ground and away from moisture, direct sunlight, extreme heat and freezing temperatures.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements:
 1. Do not apply material when substrate or ambient temperature is 40 degrees F (4 degrees C) or below or is expected to fall below 40 degrees F (4 degrees C) within 24 hours after application.
 2. Do not apply material if rain is expected within 24 hours of application.
 3. Do not apply over moving cracks, control joints, or expansion joints.
 4. Do not apply to horizontal traffic-bearing surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products from the following manufacturer:
Master Builders Solutions
889 Valley Park Drive
Shakopee, MN 55379 USA
Customer Service: 800-433-9517
Technical Service: 800-243-6739
Direct Phone: 952-496-6000
Website: www.master-builders-solutions.com/en-us
- B. Substitutions: Comply with Section [01 60 00] [__ __ __].
- C. Specifications and drawings are based on manufacturer's proprietary literature from Master Builders Solutions. Other manufacturers shall comply with minimum levels of material, color selection, and detailing indicated in specifications or on drawings. Architect/engineer will be sole judge of appropriateness of substitutions.

2.2 MATERIALS

- A. Water-based, high-build, 100 percent acrylic, waterproof coating.
 1. Acceptable Product: MasterProtect HB 400 (Formerly Thorocoat) by Master Builders Solutions.

- B. MasterProtect HB 400 Smooth:
1. Density, ASTM D1475: 11.4 to 12.4 lbs per gal (1.37 to 1.49 kg/L).
 2. Solids Content, ASTM D5201:
 - a. By Weight: 53.4 – 56.4 percent.
 - b. By Volume: 37.0 – 39.0 percent.
 3. Viscosity, ASTM D562: 105 to 120 KU.
 4. VOC Content, ASTM D3960: 0.83 lbs per gal (100 g/L), less water and exempt solvents.
- C. MasterProtect HB 400 Fine:
1. Density, ASTM D1475: 13.1 to 14.1 lbs per gal (1.57 to 1.69 kg/L).
 2. Solids Content, ASTM D5201:
 - a. By Weight: 66.6 – 71.2 percent.
 - b. By Volume: 48.0 – 50.0 percent.
 3. Viscosity, ASTM D562: 117 to 125 KU.
 4. VOC Content, ASTM D3960: 0.60 lbs per gal (72 g/L), less water and exempt solvents.
- D. MasterProtect HB 400 Coarse:
1. Density, ASTM D1475: 13.2 to 14.2 lbs per gal (1.58 to 1.70 kg/L).
 2. Solids Content, ASTM D5201:
 - a. By Weight: 67.0 – 71.6 percent.
 - b. By Volume: 50 percent.
 3. Viscosity, ASTM D562: 117 to 125 KU.
 4. VOC Content, ASTM D3960: 0.59 lbs per gal (70 g/L), less water and exempt solvents.
- E. Performance Requirements: MasterProtect HB 400 Smooth:
1. Resistance to Wind-Driven Rain, Federal Specification ASTM D 6904: Meets requirement. No water penetration.
 2. Accelerated Weathering, ASTM G152, 5,000 hours: Passes.
 3. Visual Color Change, ASTM D1729, 5,000 hours: Passes.
 4. Chalking, ASTM D4214, 5,000 hours: Passes.
 5. Freeze/Thaw Resistance, DOT Methods A and B, 50 cycles: Passes.
 6. Water-Vapor Permeance, ASTM D1653: 13 perms.
 7. Moisture Resistance, Federal Specification TT-C-555B: Meets requirement. No blistering, loss of adhesion, or discoloration.
 8. Salt Spray (Fog) Resistance, ASTM B117, 300 hours: Passes.
 9. Carbon-Dioxide Diffusion, PR EN 1062-6:
 - a. R (equivalent air-layer thickness): 1,318 feet (402 m).
 - b. Sc (equivalent concrete thickness): 39 inches (100 cm).
 10. Flexibility, ASTM D1737, 1-inch mandrel: No cracking.
 11. Dirt Pick-Up, ASTM D3719, after 6 months exposure: 92 percent. Passes.
 12. Sand Abrasion Resistance, ASTM D968, Method A, at 3,000 L: Passes.
 13. Impact Resistance, ASTM D2794, at 30 in-lbs: Passes.
 14. Fungus Resistance, ASTM D3273: No growth. Meets requirement.
 15. Mildew Resistance, Federal Specification TT-P-29 (Federal Standard 141, Method 6152 and 6271.1):
 - a. Aspergillus Oryzae, 7 days: No growth.
 - b. Aspergillus Niger, 21 days: No growth.
 16. Surface Burning Characteristics, ASTM E84:
 - a. Flame Spread: 1.
 - b. Smoke: 4.
 - c. Fuel Contribution: 7
 17. Flash point, Greater than 200 degrees F (93 degrees C) ASTM D 56 Tag Closed Tester

- F. Approximate Coverage Rate: 75 to 100 sq ft per gal (1.84 to 2.46 m²/L).
- G. Wet Film Thickness (WFT):
 - 1. Smooth: 16 to 22 mils (406 to 559 microns).
 - 2. Fine: 16 to 22 mils (406 to 559 microns).
 - 3. Coarse: 16 to 22 mils (406 to 559 microns).
- H. Dry Film Thickness (DFT):
 - 1. Smooth: 6 to 8 mils (152 to 203 microns).
 - 2. Fine: 8 to 11 mils (203 to 279 microns).
 - 3. Coarse: 8 to 11 mils (203 to 279 microns).

COATING IS AVAILABLE IN 4 TINT BASES AND 48 STANDARD COLORS THROUGH THE ELEMENTS COLOR PROGRAM. COLOR FORMULATIONS ARE AVAILABLE THROUGH THE ELECTRONIC THORO TINT MANUAL. FOR CUSTOM COLOR FORMULATIONS, CONSULT MASTER BUILDERS SOLUTIONS.

- I. Colors: _____.

DELETE TEXTURE BELOW NOT REQUIRED FOR PROJECT.

- J. Texture:
 - 1. Smooth.
 - 2. Fine.
 - 3. Coarse.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Comply with Section [01 70 00] [___ ___ ___].

3.2 SURFACE PREPARATION

- A. Protection: Protect adjacent work areas and finish surfaces from damage during coating application.
- B. Prepare surfaces in accordance with manufacturer's instructions.
- C. Ensure that substrate is sound, clean, dry, and free of dust, dirt, oils, grease, laitance, efflorescence, mildew, fungus, biological residues, and other contaminants that could prevent proper adhesion.
- D. Ensure concrete substrates have a minimum 28-day cure and are free of bond-inhibiting contaminants.
- E. Clean surface to achieve texture similar to medium-grit sandpaper.
- F. Repair holes and spalled and damaged concrete with repair materials approved by coating manufacturer.
- G. Remove protruding concrete accessories and smooth out irregularities.
- H. When chemical cleaners are used, neutralize compounds and fully rinse surface with clean water. Allow surface to dry before proceeding.
- I. Remove blisters or delaminated areas and sand edges to smooth rough areas and provide transition to existing paint areas.
- J. Check adhesion of existing paint in accordance with ASTM D3359, measuring adhesion by Tape Method A.
- K. Treat cracks greater than 1/32 inch (0.8 mm) with knife-grade or brush-grade patching compound.

- L. Treat cracks greater than 1/4 inch (6 mm) as expansion joints and fill with sealant approved by coating manufacturer.
- M. Prepare and treat cracks in accordance with manufacturer's instructions.

3.3 PRIMING

Apply primer in accordance with manufacturer's instructions.

Use primer approved by coating manufacturer.

3.4 MIXING

- A. Mix coating in accordance with manufacturer's instructions to ensure uniform color and aggregate disbursement and to minimize air entrapment.
- B. In multi-pail applications, mix contents of each new pail into partially used pail to ensure color consistency and smooth transitions from pail to pail.

3.5 APPLICATION

- A. Apply coating in accordance with manufacturer's instructions.
- B. Apply coating as a two-coat system.
- C. Maintain proper uniform wet-film thickness during application to ensure performance characteristics desired.
- D. Apply coating using consistent application techniques to achieve uniform color and texture.

3.6 PROTECTION

- A. Protect applied coating from damage during construction.

END OF SECTION

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SECTION 10 10 00 – SPECIALTIES**PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions, and Division 1 specification sections are hereby made a part of this section.

1.02 SUMMARY

- A. This Section includes all labor & materials for specialty items not indicated elsewhere.
- B. The Contractor shall furnish and install all equipment and specialty items listed below.
- C. Include all related items and work necessary for a complete job according to manufacturer's latest printed specifications, instructions, drawings, recommendations.
- D. Include items listed under products below.

1.03 REQUIREMENTS

- A. Specialties shall be as specified or the latest of its kind available, furnished with all accessories needed for a complete job, installed according to manufacturer's specifications, recommendations. Manufacturers shall furnish diagrams, illustrations, explanations, job assistance for installation.
- B. Contractor shall provide all necessary blocking, anchorage, means of support whether detailed or not.
- C. Furnish shop drawings, submittals, colors finishes to Architect for approval of all items.
- D. Equipment and Specialties shall be delivered to site, unpacked, assembled, marked and set in place ready for any connections by Mechanical and Electrical subcontractors. Demonstrate equipment and furnish parts manual to Owner. Mechanical and Electrical subcontractors shall run any water, gas, drain, electrical utilities and connect all such Specialties requiring service.
- E. Finished work shall be properly installed at recommended heights, securely attached with proper devices, level, plumb, square, perfectly fitted, in perfect working order, free of imperfections and clean.
- F. At completion of Project, furnish to Architect for Owner brochures, operating manuals, maintenance recommendations for all specialties.
- G. Contractor shall obtain exact location of these items before inside finish is installed and provide proper blocking.

1.04 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.01 INCLUDED IN THIS SECTION: All materials(whether indicated or not) needed for complete installation of products Equal to:

- A. **HANDICAP PARKING SIGNAGE:** Where indicated on site plans, provide ADA Approved aluminum signs by www.safetysign.com, www.ussignsandsafety.com, www.stopsignsandmore.com, or Prior Approved equal.
- B. **BOOK DEPOSITORY:** Pre-manufactured Book Drop shall be ¼ inch extruded aluminum construction with engraved letters on hopper door reading BOOK DEPOSITORY. Book drop finished in powder coat Duranodic dark Bronze finish. Model CC11RL by AF Florence manuf. or equal products by www.nationalmailboxes.com, Kingsley company, or equal product submitted for approval prior to installation.
- C. **FLAGS for Existing Poles:** See Site Plan Sheet SP2.1. Provide 2 flags for 4 poles. Provide one 5'x8' Louisiana State Flag, one 5'x8' American Flag. Other flags by owner.

- D. **ALUMINUM LADDER FOR ROOF HATCH:** See Floor plan for location. Furnish and install where indicated on plans ladder – 10'- 0" x 20" fixed access wall mount steel ladder for access to existing roof hatch. Ladder to have Yellow Rust resistant finish. Heavy duty roof hatch access vertical Ladder shall meet or exceed OSHA, ANSI 3123 and A14.3.
 Ladder rungs are 18" wide in the inside, mounted on 12" spacing. Rungs are made with 3/4 solid steel, welded to side rails, and treated for sure-footed climbing.
 Ladder rungs shall have 500 min pound loading capacity. Side rails shall have easy to grasp, 1" diameter, made from 1" Steel pipe.
 The Hatch Access Vertical Ladder is "heavy duty"-- for the heavier loads associated with equipment repair and maintenance personnel, and designed to install just below a hatch door to assure safe entry and exit. Standard wall mounting brackets shall be included with all ladders.
Acceptable Manufacturers:
 Best Materials : www.BestMaterials.com, Aluminum Ladder Company, Nall & Company Inc www.steelaccessladders.com , or O'Keeffe's Inc. www.okeeffes.com
- E. VERTICAL FLAT SCREEN INFORMATION DISPLAY MONITOR at AREA 103 (wall mount)-By Owner
 F. FLAT SCREEN MONITORS/ 15 total wall mount brackets & 4 total ceiling mount brackets-By Owner
 G. PODCAST EQUIPMENT-By Owner
 H. SITE SIGNAGE -Replace Existing with new Cabinet on existing pylon structure, 2 sided 4' x 10' electric message board, MFG Arched Header, black cornice decorative filters, remove existing sign cabinet, paint existing column covers, saddle mount for connect to nearby power. Agnew Sign Company has provided a quote for this work if you want to contact them at 318-323-2202. (see photo of desired sign below).



- I. ACOUSTIC SLAT WOOD WALL PANELS - Install on North & South Walls of Open Area shown on Sheet A6.1. Include three horizontal 1x4 strips secured to wall studs for securing panels. Panels shall be equal to American Oak 3'-11 1/4" high x 2'- 1 1/4" wide Luxury American Oak Acoustic Wood Wall Panels Original Slatpanel with black felt, www.thewoodvenerhub.com 302-216-6177. Install per manuf. instructions using 2 black fasteners between the boards into each of three horizontal 1x4 stripping. Clear waterbased polyurethane finish by Section 09 90 00.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturers written instructions and Division 1 requirements.

END OF SECTION

**Section 10 10 01: Area of Refuge/Elevator Landing
Two-Way Communication System**
(includes Base Station, Call Boxes, and Signage)

Part 1 – General

1.0 Basis of Design - This System is based on the following equipment by:

RATH® Communications
N56 W24720 North Corporate Circle
Sussex, WI 53089
800-451-1460
Website: www.rathcommunications.com

Other Manufacturers with equal equipment are acceptable

2.0 Summary

- 2.1 The *Base Station* is to be located at a central control point on the first floor or as determined by local Authority Having Jurisdiction. Call Boxes are to be located on all floors above and below the first floor, ideally next to a stairwell emergency exit or elevator landing on each floor.
- 2.2 The *Base Station* must be capable of handling a minimum of 5 *Call Boxes*. Visual indicators on the *Base Station* allow rescue personnel to know which *Call Box* needs assistance. The *Base Station* must allow rescue personnel to speak to all *Call Boxes* or individual *Call Boxes*.
- 2.3 The emergency communication hardware shall comply with the Americans with Disabilities Act (ADA). The *Call Box* shall have the ability to be programmed with up to 5 emergency phone numbers. Upon activation of the emergency push button, a call will be automatically placed to the *Base Station*. If no one answers at the *Base Station*, the *Call Box* must dial a secondary location outside the building to activate **two-way off-site person to person voice communication** via landline, cellular or IP device.

3.0 Submittals

- 3.1 Submit product data sheets. Include operation manuals.
- 3.2 Wiring or shop diagrams detailing wiring schematics, cabling.

4.0 Construction

- 4.1 The *Base Station* (models 2500) must have a Stainless Steel or powder coated steel housing, red coil cord emergency handset, be 24vdc or 120vac powered, and include a rechargeable battery to maintain backup power for a minimum of 4 hours of talk time.
 - 4.2 The *Call Boxes* (models 2100) must be in full compliance with ADA requirements. *Call Boxes* require a hands-free speakerphone with an LED to indicate status of call.
-

- 4.3 The *Call Boxes* must allow the programming in of a specific location message of the *Call Box*. This allows rescue personnel to know the location of the activated *Call Box*.
- 4.4 The *Call Boxes* are to be located no higher than 48" front reach, or 54" side reach to the center of the push button above ground level to ensure conformance with the ADA requirements.
- 4.5 The Area of Refuge *Call Boxes* must have a Braille face plate to ensure conformance with the ADA requirements.
- 4.6 The *Base Station* must provide an audible and visual indicator that a *Call Box* has been activated.
- 4.7 The 24vdc *Power Supply* part # 2500-PWR24U must be capable of supplying power to a minimum of 10 *Call Boxes* and the *Base Station*.

5.0 Mounting

- 5.1 The *Base Station* is to be mounted on a wall, surface, or flush mounted.
- 5.2 *Call Boxes* are to be wall, surface, or flush mounted.

6.0 Electrical

- 6.1 *Call Boxes* and *Base Station* are to be powered by RATH® 24vdc *Power Supply* part # 2500-PWR24U. *Base Station* to have option of 120vac power. Wiring shall be RATH® Custom Power Cable (part # RP7500094P).
- 6.2 Wiring from the *Base Station* to the *Call Boxes* shall be RATH® Custom Communication Cable (part # RP7500094). If CI 2 hour fire-rated cable is required, use RATH® Communication Cable part # RP6600300M.
- 6.3 *Call Boxes* must have built-in battery backup and include a rechargeable battery to maintain backup power for a minimum of 4 hours of talk time.
- 6.4 *Base Station* must have a built-in battery backup and include a rechargeable battery to maintain backup power for a minimum of 4 hours of talk time.
- 6.5 System shall be in compliance with all state and local electrical codes.

7.0 Communications

- 7.1 The *Call Boxes* shall be an ADA compliant and vandal resistant speakerphone.
 - 7.2 The *Call Boxes* shall be hands-free and be a push-button-once to talk system. Once the button has been pushed, the *Call Box* will call the *Base Station*. If no answer at the *Base Station*, it will automatically call pre-programmed emergency numbers. The *Call Box* must be capable of being programmed with up to 5 emergency numbers.
-

- 7.3 *Call Box* shall have location message capability. *Call Box* must have a minimum 18 second recordable message capability, programmable to play 1 or 2 times. *Call Box* shall notify called party of the location of the call upon being received at the emergency dispatch center.
- 7.4 *Call Box* shall be capable of allowing the called party to replay the location message if necessary to ensure an understanding of the caller location.
- 7.5 If system is not attended 24 hours a day, the *Call Box* must dial a secondary location outside the building to activate **two-way off-site person to person voice communications**.
- 7.6 Once call has been made (button pushed), the call can only be terminated by the called party.
- 7.7 *Call Box* must have a red LED that will light up upon push of the button. The light shall be a solid color when the *Call Box* is activated and will flash when call has been answered.
- 7.8 The *Call Box* must be capable of being programmed and re-programmed on-site and remotely.
- 7.9 Standard *Call Box* features:
 - 7.9.1 Five number programming.
 - 7.9.2 Operating temperature of between -40°F to +150°F (-40° to + 65° C).
 - 7.9.3 Programmable passwords.
 - 7.9.4 On-site or remote programmable.
 - 7.9.5 EEPROM memory to protect programming.

8.0 Signage

- 8.1 System shall consist of a minimum of one 120/277vac edge light sign (part # 7050 or 7050E), and a "location" and "instruction" sign (part # 7049SS) to clearly indicate location of designated area. A tactile sign (part # 7043/7044 or 7087) with raised letter and Braille shall be located at entrance to area.

9.0 Graphics

- 9.1 *Base Station* must include wording identifying the location of each *Call Box* and light an LED when a particular *Call Box* has been activated.
- 9.2 *Call Box* wording must include "Emergency Phone", International Phone Symbol, and raised Braille lettering.

10.0 Cabling

- 10.1 Cabling for two-way communication system shall meet the applicable requirements for pathway survivability. Cabling installation shall consist of one or more of the following:
 - 10.1.1 2 hour fire-rated circuit integrity (CI) cable – RATH® Part # RP6600300M
————— (for a UL Listed option use part # RPP66010002). —————
 - 10.1.2 2 hour fire-rated cable system.
 - 10.1.3 2 hour fire-rated enclosure or protected area.

11.0 Warranty

11.1 The *Base Station* and *Call Boxes* shall be warranted for a period of two years.



SECTION 10 11 00 - VISUAL DISPLAY BOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.

1.2 SUMMARY

- A. Section Includes all material and labor for the complete installation of:
 - 1. Marker boards.
 - 2. Tack boards.
- B. Furnish and install all markerboards and tackboards (marked M.B. and T.B.) where indicated on plans. Include all clips and mounting brackets, as needed. Height shall be 4'. See Plans for lengths and locations.

1.3 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com

1.4 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. A135.4 - Basic Hardboard.
 - 2. A208.1 - Mat Formed Wood Particleboard.
- B. ASTM International (ASTM):
 - 1. A424 - Standard Specification for Steel Sheets for Porcelain Enameling.
 - 2. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 4. B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 5. E84 - Standard Test Method for Surface Burning Characteristics for Building Materials.
- C. Porcelain Enamel Institute (PEI) - Performance Specifications for Porcelain Enamel Chalkboards.

1.5 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Descriptive data on display boards, including marker board surface, tack boards, frame, trim, and accessories.
 - 2. Samples:
 - a. 3 x 5 inch marker board samples in selected color.
 - b. 3 x 3 inch fabric facing samples showing available colors.

1.6 QUALITY ASSURANCE

- A. Fabric: Fire hazard classification of 25 or less, tested to ASTM E84.
- B. Marker board to be magnetic.
- C. As a writing surface: Must be able to accept water-based marker. All writings shall be clearly visible and cleanly erase. Surface shall be glare free and not reflect light fixtures and windows. Writings shall be clearly visible from any angle. Board shall be magnetic to receive magnets. As a projection surface: Must be optically designed to permit a daylight image projection (with 200 watt projector up to a distance of 8'0"). Projected images shall be uniform with no "hot spot" reflection of the projector. As a bulletin board: Must be able to accept any dry adhesive such as cellophane and masking tapes. Tapes should be easily removed leaving no residue and should not harm or discolor the surface if left for extended periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Aywon Chalkboard and Corkboard, Inc., www.aywon.com
 - 2. Best-Rite Mfg. (www.bestrite.com)
 - 3. Claridge Products and Equipment, Inc., www.claridgeproducts.com
 - 4. Poly vision,
 - 5. American Visual Display
 - 6. Prior Approved Equal.

2.2 MATERIALS

- A. Steel Sheet:
 - 1. ASTM A424, Type 1, Commercial Quality.
- B. Fabric: Manufacturer's standard vinyl fabric.
- C. Cork: Natural cork color impregnated.

2.3 ACCESSORIES

- A. Fasteners: Type best suited to application.
- B. Adhesive:
 - 1. Type recommended by marker board manufacturer; compatible with substrate materials.

2.4 FABRICATION

- A. Marker Boards:
 - 1. Facing: Porcelain enamel on steel sheet, 24 gage. (must hold magnet)
 - 2. Core: Particleboard, 3/8 inch thick.
 - 3. Backing: Galvanized steel sheet, 28 gage.
- B. Frame and Trim:
 - 1. Frame: Extruded aluminum, manufacturer's standard profile, concealed fasteners, with map rail with cork insert at top and continuous tray at bottom.
 - 2. Map/display rail: Extruded aluminum, manufacturer' standard profile, full width of marker board, 1 inch high cork insert.
 - 3. Map supports: Formed aluminum, sliding, to fit map rail; provide two hooks per 4 feet of map/display rail or fraction thereof.
 - 4. Tray: Continuous aluminum eraser tray length of board.

2.5 FINISHES

- A. Baked Enamel: Thermosetting resin enamel, manufacturer's standard, color to be selected.
- B. Fabric: Cork:
- C. Aluminum Frame and Trim: Anodized, clear.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install visual display boards in accordance with manufacturer's instructions.
- B. Set boards plumb and level.
- C. Secure with concealed fasteners.

3.2 PROTECTION

- A. Cover marker board surfaces with temporary protective cover taped to frame.

END OF SECTION

SECTION 10 14 23 - SIGNAGE & DIMENSIONAL LETTERS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.02 SCOPE

- A. Provide and install all identifying devices indicated on drawings and specified herein.
 - 1. Provide ADA Type Signage as indicated on plans. One sign per Room.
 - 2. All signage as indicated on Plan Sheets.
- B. Include all clips, supports, screws and mounting brackets for complete installation.

1.03 SUBMITTALS

- A. Submit manufacturers descriptive brochures and necessary supplemental detailed information indicating quality, finishes and accessories required for complete installation.
- B. Camera ready layout shall be prepared by the manufacturer of graphic panel directory and approved by Architect prior to fabrication.
- C. Colors shall be selected by Architect from manufacturer's color.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver items in manufacturer's original unopened protective packaging.
- B. Store materials in original protective packaging to prevent soiling, physical damage, or wetting.
- C. Handle so as to prevent damage to finished surfaces.

PART 2 - PRODUCTS

2.01 DESCRIPTION

- A. INTERIOR SIGNAGE - PLASTIC ADA: Acrylic sign, custom color to be selected by Architect. Sign size may vary slightly by manufacturer, but must comply with ADA. Approved manufacturers are Concept One, Kapco, Best Manufacturing Sign Systems, and The Southwell Co. See Plans for types and sizes.

All signage shall comply with ADAG with raised characters 1/32" Sans Serif style, 5/8" minimum height, Grade 2 Braille, white letters on blue background, non-glare finish. Character proportion: letters and numbers shall have a width to height ratio between 3:5 and 1:1 and a stroke width to height ratio between 1:5 and 1:10.

- B. FORMED PLASTIC SIGNAGE: All upper case with bevel faced, Helvetica style by Gemini. Provide mounting kit with aluminum stud for mounting to material indicated. Provide adhesive mount where applied to plastic laminate. Approved manufacturers are Gemini, Ark Ramos or Best.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect surfaces to verify suitability.
- B. Do not proceed until all conditions are acceptable.
- C. Existing numbers are mounted on columns, gables, doors, eaves and walls. Verify location with Architect prior to re install.

3.02 INSTALLATION

- A. Provide all clips and mounting brackets for complete installation.
- B. Install adjacent to doors where scheduled on Drawings.
- C. Install all identity devices as per manufacturers recommendations and as indicated on drawings.

END

SECTION 10 14 29 – DIMENSIONAL LETTERS & PLAQUE**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.
- B. Related Sections include the following:
 1. Section 01 50 00 "Temporary Facilities and Controls" for temporary project sign.
 2. Section 10 14 23 "Interior Signage"
 3. Division 23 for labels, tags, and nameplates for mechanical equipment.
 4. Division 26 for labels, tags, and nameplates for electrical equipment.

1.2 SUMMARY

- A. This Section includes all labor & material as needed for identifying devices as indicated on the Drawings including:
 1. Metal and plastic letters.
 2. Cast metal plaque.
 3. Handicap Accessible Sticker at Entrances.
 4. Backlit Letters & Logo
- B. Include in Bid, all graphic design, all artwork layout, all re-creation of graphics in bid documents as necessary including items necessary for the completion of work whether or not they are shown in the documents, but are necessary to provide the intended results. No additional drawings will be provided by the architect.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each product.
- B. Samples for Verification: For each type of sign, include the following Samples to verify color selected:
 1. Dimensional Characters: Full-size Samples of each type of dimensional character (letter and number) required. Show character style, material, finish, and method of attachment.
 2. Casting: Show representative texture, character style, spacing, finish, and method of attachment.
 3. Approved samples will not be returned for installation into Project.
- C. Shop Drawings: Show fabrication and installation details for signs.
 1. Show mounting heights, locations of supplementary supports to be provided by others, and accessories.
- D. Sign Schedule: Use same designations specified or indicated on Plan Sheets A8.2

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative of signage manufacturer for installation and maintenance of units required for this Project.
- B. Single Source: Obtain each sign type through one source from a single manufacturer.
- C. Regulatory Requirements: Comply with the Americans with Disabilities Act (ADA) and with code provisions as adopted by authorities having jurisdiction.
 1. Interior Code Signage: Provide signage as required by accessibility regulations and requirements of authorities having jurisdiction. These include, but are not limited to, the following:
 - a. Signage as indicated & scheduled on Sheet A 8.1.
 2. Exterior Code Signage: Provide signage as required by accessibility regulations and requirements of authorities having jurisdiction. These include, but are not limited to, the following:
 - a. Accessible Entrance Signage.
 - b. Accessible Parking Signage..

1.5 PROJECT CONDITIONS

- A. Field Measurements: Where sizes of signs are determined by dimensions of surfaces on which they are installed, verify dimensions by field measurement before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION

- A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.
 - 1. For signs supported by or anchored to permanent construction, furnish templates for installation of anchorage devices.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within Five years from date of Substantial Completion.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image.
 - c. Separation or de-lamination of sheet materials and components.

1.8 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.1 EXTERIOR PLASTIC LETTERS – (secure with aluminum standoffs to metal siding for uniform smooth appearance)

- A. The Goudy Extra Bold plastic letters by Gemini Inc. are *used to denote the quality standard of product desired and it does not restrict bidders to the specific brand, make, manufacturer, or specification named; it is used only to set forth and convey to prospective bidders the general style, type, character, efficiency, and quality of product desired; and that products listed below with equivalent efficiency and quality will be acceptable.*

- 1. Acceptable Manufacturer's:
 - a. American Graphics Inc.
 - b. Gemini Incorporated.
 - c. Metal Arts; Division of L & H Manufacturing
 - d. Approved equal

- C. Finish: To be selected from Full range of Standard Colors.

2.3 CAST-METAL PLAQUES

- A. General: Provide castings free from pits, scale, sand holes, and other defects. Comply with requirements specified for metal, border style, background texture, and finish and in required thickness, size, shape, and copy. Available Manufacturers:
 - 1. Ark Ramous Inc.
 - 2. Gemini, Inc.
 - 3. Approved equal

- B. Bronze Castings: Provide bronze castings of alloy and temper recommended by sign manufacturer for casting process used and for use and finish indicated. Border Style: Raised flat band. Background Texture: Manufacturer's standard stipple finish. Mounting: Concealed studs for substrates encountered.
- C. Clear Finish: Natural satin finish with clear polyurethane protective coat. Cast-Metal Plaque Finishes:
 - 1. Raised Areas: Hand-tool and buff borders and raised copy with manufacturer's standard satin finish.
 - 2. Background Finish: Leatherette texture.
 - 3. Size: Approximately 36"h X 24"w
 - 4. Content, centered on the plaque in the following order:
Text: Name of Facility in 1.5"h letters, Year facility was completed in ½"h letters, Name of the Owner in 1"h letters, Name of the Architect in ¾"h letters, Name of the Contractor in ¾"h letters.
- D. Final approval of the Owner and the User Agency of the plaque layout or "rubbing" shall be obtained by the Architect prior to the casting of the plaque.

2.4 HANDICAP STICKER

- A. Self-Adhesive vinyl stickers with international symbol of accessibility. 4" x 4".

2.5 EXTERIOR BACKLIT LETTERS & LOGO - **Shown on Exterior Elevations**

- A. Metal Fabricated Channel letters with LED lights –
 - 1. Acceptable Manufacturer's:
 - a. American Graphics Inc.
 - b. Gemini Incorporated.
 - c. Metal Arts; Division of L & H Manufacturing
 - d. Approved equal

2.6 ACCESSORIES

- A. Anchors and Inserts: Provide stainless steel anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.7 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.
- D. Clear Anodic Finish: Manufacturer's standard clear anodic coating, 0.018 mm or thicker, over a satin (directionally textured) mechanical finish.
- E. Exterior letters and mounts shall be Stain Free for a period of 5 years after Substantial Completion.

PART 3 - EXECUTION

3.1 SCHEDULE

- A. Cut Metal Letters: Use template to install in accordance with manufacturer's written instructions and space the letters in accordance with Architect's Directions.
- B. Vinyl Letters & Graphics: See sheets A3.1 & A4.2
 - 1. Verify exact wording with Architect/Owner prior to ordering.
 - 2. Secure letters/graphics where shown on plans.

3.2 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts, provided under other sections of Work are sized and located to accommodate signs.
- C. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

- A. General: Locate signs and accessories where indicated or as coordinated with Architect, using mounting methods of types described and in compliance with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.
- B. Dimensional Characters: Mount characters using standard fastening methods recommended in writing by manufacturer for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.
 - 1. Projected Mounting: Mount characters at projection distance from wall surface indicated.
- C. Cast-Metal Plaques: Mount plaques using standard fastening methods recommended in writing by manufacturer for type of wall surface indicated.
 - 1. Concealed Mounting: Mount plaques by inserting threaded studs into tapped lugs on back of plaque. Set in pre-drilled holes filled with quick-setting cement.

3.4 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION

SECTION 10 21 13

HDPE TOILET COMPARTMENTS

GENERAL

1.1 SECTION INCLUDES

1.2 Solid plastic toilet compartments including the following: (Hiny Hiders)

1. Floor mounted overhead-braced toilet compartments.
2. Privacy screens.
3. Shower and dressing compartments.
4. Include all concealed bracing in wall or above ceiling.

1.3 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry: Anchorage/blocking for attachment of partitions.

1.4 REFERENCES

- A. ASTM A 666 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- B. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- C. National Fire Protection Association (NFPA) 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.
- D. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
5. Preparation instructions and recommendations.
 6. Storage and handling requirements and recommendations.
 7. Installation methods.
- C. Shop Drawings: Provide layout drawings and installation details with location and type of hardware required.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples representing actual product, color, and patterns.
- F. Sustainable Design Submittals:
1. Recycled Content: Certify percentages of post-consumer and pre-consumer recycled content.
 2. Regional Materials: Certify distance between manufacturer and Project and between manufacturer.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A company regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.
- B. Installer Qualifications: A company regularly engaged in installation of products specified in this Section, with a minimum of 5 years experience.
- C. Materials: Doors, panels and pilasters shall be constructed from High Density Polyethylene (HDPE) resins. Partitions shall be fabricated from polymer resins compounded under high pressure, forming a single component which is waterproof, nonabsorbent and has a self-lubricating surface that resists marks from pens, pencils, markers and other writing instruments. All plastic components shall be covered with a protective plastic masking.
- D. Performance Requirements:
 - 1. Fire Resistance: Partition materials shall comply with the following requirements, when tested in accordance with the ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials:
 - 2.
 - a. Class A flame spread/smoke developed rating, tested to ASTM E84.
 - b. Material Fire Ratings:
 - c. National Fire Protection Association (NFPA) 286: Pass.
 - d. International Code Council (ICC): Class B.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

- A. Manufacturer guarantees its plastic against breakage, corrosion, and delamination under normal conditions for 25 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. (Labor not included in warranty.)

PART 2 PRODUCTS

2.1 MANUFACTURERS EQUAL TO:

- A. Acceptable Manufacturer: Scranton Products, which is located at: 801 E. Corey St. ; Scranton, PA 18507; Toll Free Tel: 800-445-5148; Email: [request info \(info@scrantonproducts.com\)](mailto:request_info@scrantonproducts.com); Web: www.scrantonproducts.com
 - 1. Fabricator: Santana Toilet Partitions.
 - 2. Fabricator: Comtec Toilet Partitions.
 - 3. Fabricator: Capitol Toilet Partitions.
- A. Substitutions:
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00.

2.2 MATERIAL

- A. Plastic Panels: High density polyethylene (HDPE) suitable for exposed applications, waterproof, non-absorbent, and graffiti-resistant textured surface;
 - 1. Fire-resistance Rating: Class A.
 - 3. Fire-resistance Rating: NFPA 286.
- B. Zinc Aluminum Magnesium and Copper Alloy (Zamac): ASTM B 86.
- C. Stainless Steel Castings: ASTM A167, Type 304.
- D. Aluminum: ASTM 6463-T5 alloy.

2.3 SOLID PLASTIC TOILET COMPARTMENTS

- A. Basis of Design: Hiny Hiders Toilet Partitions as manufactured by and supplied by Scranton Products.
 - 1. Style: Floor-to-ceiling toilet compartments.
 - 2. Doors, panels, and pilasters shall be 1 inch (25 mm) thick with all edges rounded to a radius. Doors and dividing panels shall be mounted based on height of specified system.
 - 1. Door and Panel Height: 55 inches standard (1397 mm) (standard).
 - 2. Door Design: Traditional 2600.
 - 3. Door & Pilaster Edge: Standard.
 - 4. Pilasters shall be 82 inches (2083 mm) high fastened to floor.
- B. Panel Color: Traditional Series: By Architect
 - 1. Black - Orange Peel.
 - 2. Black - Grip Ex.
 - 3. Paisley - Orange Peel.
 - 4. Shale - Orange Peel.
 - 5. Charcoal Grey - Orange Peel.
 - 6. Grey - Orange Peel.
 - 7. Glacier Grey - Orange Peel.
 - 8. White - Orange Peel.
 - 1. Pilaster shoes shall be 3 inches (76 mm) high stainless steel (type 304, 20 gauge) secured to the pilaster with a stainless steel tamper resistant Torx head sex bolt.
- C. Headrail shall be made of heavy-duty extruded aluminum (6463-T5 alloy) with anti-grip design. The headrail shall have a clear anodized finish and shall be fastened to the headrail bracket by a stainless steel tamper resistant Torx head sex bolt, and fastened at the top of the pilaster with stainless steel tamper resistant Torx head screws.

Headrail brackets shall be 20 gauge stainless steel with a satin finish and secured to the wall with a stainless steel tamper resistant Torx head screws.
- D. Wall Brackets: Full height continuous stainless steel bracket for urinal & toilet partitions secured to wall.
 - 1. Stainless Steel Brackets: Wall brackets shall be made of stainless steel type 304.
 - 2. The brackets are fastened to the pilaster with stainless steel tamper resistant Torx head screws and fastened to the panels with stainless steel tamper resistant Torx head sex bolts.

3. Bracket Type: Continuous 54 inches (1372 mm) stainless steel.
- E. Hinges: 71 inches (1803 mm) continuous stainless steel helix.
1. Continuous Piano type Wrap-Around Hinges : Hinges shall be fabricated from heavy-duty cast aluminum, wrap around flanges through bolted to doors and pilasters. Hinges operate with field adjustable nylon cams. Cams can be field set in 30, 60 or 90-degree increments.
 2. Door strike/keeper shall be made of heavy-duty extruded aluminum (6436-T5 alloy) with a bright dip anodized finish and secured to the pilasters with stainless steel tamper resistant Torx head sex bolts. Bumper shall be made of extruded black vinyl.
 - a. Style: 71 inches (1803 mm) aluminum
 - a. Style: 3 inches (76 mm) stainless steel emergency access
 3. Stainless Steel Paddle Latch and housing shall be made of heavy-duty stainless steel type 304. The latch housing and paddle shall have a bright finish.
 4. Provide occupancy indicator.
 5. Each door shall be supplied with one coat hook/bumper and door pull made of chrome plated Zamak.
 6. Equip outswing handicapped doors with second door pull and door stop.

2.4 SOLID PLASTIC PRIVACY SCREENS – **NOT REQUIRED UNLESS SPECIFICALLY SHOWN ON PLANS**

- A. Provide plastic privacy screens in urinal and entry toilet room applications as indicated or scheduled.
- B. Panels, and pilasters, if required, shall be 1 inch (25 mm) thick with all edges rounded to a radius. Screens shall be mounted at 14 inches (356 mm) above the finished floor. Color as selected by Architect from manufacturer's full line of current colors.
- C. Type: Wall mounted urinal screen.
 1. Screen: Urinal screens shall be 14 inches (457 mm) wide by 42 inches (1067 mm) high secured to wall with continuous stainless steel bracket each side of screen.
- C. Type: Pilaster supported screen.
 1. Configuration: Floor to ceiling pilaster supported screen.
 4. Screen: Urinal screens shall be 18 inches (457 mm) wide by 42 inches (1067 mm)
 12. Headrail brackets shall be 20 gauge stainless steel with a satin finish and secured to the wall with a stainless steel tamper resistant Torx head screws.
 13. Floor to Ceiling Supported Pilaster: A stainless steel angle shall be used to attach pilasters to floor and ceiling. These angles shall be attached to pilasters with 3/4 inch (19 mm) stainless steel tamper resistant Torx head screws. Pilaster sleeves shall be 4 inches (102 mm) high.
 - a. Pilaster sleeves shall be stainless steel (type 304, 20 gauge) secured to the pilaster with a stainless steel tamper resistant Torx head sex bolt.
 - a. Pilaster sleeves shall be stainless steel (type 304, 20 gauge) secured to the pilaster with a stainless steel tamper resistant Torx head sex bolt.

- D. Wall brackets shall be 1-1/2 inches (38 mm) stirrup type made of heavy-duty aluminum (6463-T5 alloy). Stirrup brackets shall be fastened to panel/pilaster with stainless steel tamper resistant Torx head sex bolts.

2.5 SOLID PLASTIC SHOWER AND DRESSING COMPARTMENTS – OVERHEAD BRACED

- A. Provide plastic privacy screens in shower room applications as indicated or scheduled.
- B. Panels and pilasters shall be 1 inch (25 mm) thick with all edges rounded to a radius. Screens shall be mounted at 14 inches (356 mm) above the finished floor. Color as
- C. Type: Floor mounted pilaster supported screen.
 - 1. Panels: Panel screens shall be 76 inches (1930 mm) high.
 - 2. Pilaster: Pilaster screens shall be 82 inches (2083 mm) high.
 - 3. Headrail: Headrail shall be made of heavy-duty extruded aluminum (6463-T5 alloy) with anti-grip design and integrated curtain track. The headrail shall have a clear anodized finish and shall be fastened to the headrail bracket by a stainless steel tamper resistant Torx head sex bolt, and fastened at the top of the pilaster with stainless steel tamper resistant Torx head screws.
 - 3. Headrail brackets shall be 20 gauge stainless steel with a satin finish and secured to the wall with a stainless steel tamper resistant Torx head screws.
 - 4. Pilaster sleeves shall be 3 inches (76 mm) high. Pilaster sleeves shall be stainless steel (type 304, 20 gauge) secured to the pilaster with a stainless steel tamper resistant Torx head sex bolt.
 - 5. Wall brackets shall be continuous made of heavy-duty aluminum (6463-T5 alloy) with a bright dip anodized finish. Brackets shall be fastened to panel/pilaster with stainless steel tamper resistant Torx head sex bolts.
 - 6. Shower Curtains: White non PVC, 42 inches wide x 72 inches high, hung with aluminum curtain hooks with self-lubricating Delrin slides.

2.6 SOLID PLASTIC VANITY

- A. Provide vanities in sizes and applications as indicated or scheduled.
- B. Tops, Splashes, Skirts, End and Center Supports: 1 inch (25 mm) thick with all edges rounded to a radius. Screens shall be mounted at 14 inches (356 mm) above the finished floor. Color as selected by Architect from manufacturer's full line of current colors.
- C. Pilaster sleeves shall be 3 inches (76 mm) high one-piece molded HDPE secured to the pilaster with a stainless steel tamper resistant Torx head sex bolt.
- D. Attachment Brackets: 16 inches (406 mm) long, heavy duty extruded aluminum with bright dip anodized finish.

PART 3 GENERAL

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the

best result for the substrate under the project conditions.

- C. Examine areas to receive toilet partitions, screens, and shower compartments for correct height and spacing of anchorage/blocking and plumbing fixtures that affect installation of partitions. Report discrepancies to the architect.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install partitions rigid, straight, plumb, and level manor, with plastic laid out as shown on shop drawings.
- C. Clearance at vertical edges of doors shall be uniform top to bottom and shall not exceed 3/8 inch (9.5 mm).
- D. No evidence of cutting, drilling, and/or patching shall be visible on the finished work.
- E. Finished surfaces shall be cleaned after installation and be left free of imperfections.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 10 28 00 - TOILET ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.
- B. Related Sections include the following:
 - 1. Section 06 10 00 "Rough Carpentry" for blocking.
 - 2. Section 10 21 13 "Toilet Partitions".

1.2 SUMMARY

- A. This Section includes all labor & all materials required, etc. for complete installation of toilet and bath accessory items as scheduled.

1.3 SUBMITTALS

- A. Product data for each toilet accessory item specified, including construction details relative to materials, dimensions, gages, profiles, mounting method, specified options, and finishes.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise acceptable to Architect.

1.5 PROJECT CONDITIONS

- A. Coordinate accessory locations, blocking in walls, installation, and sequencing with other work to avoid interference with and ensure proper installation, operation, adjustment, cleaning and servicing of toilet accessory items.

1.6 WARRANTY

- A. Warranty Period: 10-years from date of Substantial Completion.
- B. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

1.7 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering toilet accessories that may be incorporated in the Work include, but are not limited to, the following:
 - 1. American Accessories
 - 2. J & J Washroom Accessories.
 - 3. Bobrick Washroom Equipment, Inc.
 - 4. Bradley Corporation.
 - 5. Prior approved equal.

2.2 MATERIALS, GENERAL

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 0.034-inch (22-gage) minimum thickness.
- B. Sheet Steel: Cold-rolled, commercial quality ASTM A 366, 0.04-inch (20-gage) minimum. Surface preparation and metal pretreatment as required for applied finish.
- C. Galvanized Steel Sheet: ASTM A 527, G60.

- D. Mirror Glass: Nominal 6.0-mm (0.23-inch) thick, conforming to ASTM C 1036, Type I, Class 1, Quality q2, and with silvering, electro-plated copper coating, and protective organic coating.
- E. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit, or of galvanized steel where concealed.
 1. Provide each in the rooms as indicated on the drawings: (Refer to manufacturer mounting height specifications for ADA approved height installation).

2.3 PRODUCTS -

- A. SURFACE MOUNT PAPER TOWEL DISPENSER:
Equal to Global Plastic C-Fold/Multi-Fold Paper Towel Dispenser 350 C-Fold/540 Multi-Fold Smoke Gray.
- B. TOILET TISSUE HOLDER:
Equal to Global Plastic Jumbo Bathroom Tissue Dispenser - One 9" Roll-Smoke Gray.
- C. SOAP DISPENSER:
Equal to Global Manual Dispenser for Foam Hand Soap/Sanitizer- Smoke Gray.
- D. STANDARD MIRROR:
Gamco A Series A-18x36, Bradley #mir780-1836, American Accessories AR series 1836 or Prior Approved Equal.
- E. GRAB BARS:
Gamco or Bradley Textured Grip 1 1/2" dia. By length shown on plans with
Concealed flanges. Provide appropriate installation kit for various wall materials, toilet partitions, etc. verify exact sizes and configurations prior to ordering.
- F. ELECTRIC HAND DRYER:
Model DA52-973 surface mount hand dryers shall be manufactured by World Dryer Corporation® to include a cover made of 14 gauge thick brushed stainless steel. Motor shall be universal type, 1/10 HP at 7500 RPM. Dryers shall deliver 200 cubic feet per minute of air volume (7300 LFM). Timer shall be electromechanical cam-style with 25 AMP switch to operate dryer for 30 second period on push button units. Reflective infrared sensor detects hands, initiates and terminates drying on automatic units. Hand dryers shall be listed under re-examination service of Underwriters Laboratories, Inc. Equal product by American Dryer, Inc., Nova Hand Dryers or Prior Approved Equal.
- G. BABY CHANGING STATION:
Basis of Design: Model KB310 with external stainless steel bag hook as manufactured by Koala Kare Products, a Division of Bobrick. Or prior approved equal. (Finish to be selected by architect)
Handles: Station shall have two solid handles that allow operation with less than 5 lbs. of force. Handles rest below 27" for cane detection when unit is in the down position.
Front Panel shall be deep drawn, one-piece, seamless, 18-8, Type 304, 20 gauge (0.91mm) stainless steel with satin finish and laser etched logo with rounded corners.
Flange: Deep drawn, one-piece seamless, 18-8, Type 304, 18 gauge (1.2 mm) stainless steel with satin finish. Flange edges and corners shall have radii that complements the arc on the top, bottom, and side edges of the front panel.
Frame and Hinge Mechanism: Concealed 11-gauge chassis, compromised of 1" diameter integral steel-tubing that supports the changing bed and interacts with 11-gauge steel wall mounting bracket to provide steel-on-steel hinge stop. The wall frame shall serve as wall-mounting bracket.
External Diaper Bag Hook: 18-8, Type 304, 3/4 inch (19mm) diameter, wall-mounted, solid stainless steel rod with satin-finish.
Bed Surface: injection molded polypropylene with Microban® antimicrobial additive, and ISO 22196 tested for efficacy.

Surface is contoured, concave and smooth. Bed surface shall be minimum 535 sq. in.

Complies with requirements applicable in the jurisdiction of the project, including but not limited to ADA, TAS, ICC A117.1, International Building Code (IBC), and state building code requirements as applicable.

Also complies with ASTM Standard F2285, Standard Consumer Safety Performance Specification for Diaper Changing Stations for Commercial use and EN 12221 for changing units for domestic use.

Operation: Concealed pneumatic cylinder providing controlled opening and closing of the changing station bed.

Safety Straps: Replaceable, restraining straps.

2.4 FABRICATION

- A. General: No names or labels are permitted on exposed faces of toilet and bath accessory units. On either interior surface not exposed to view or on back surface, provide identification of each accessory item either by a printed, waterproof label or a stamped nameplate indicating manufacturer's name and product model number.
- B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.
- C. Framed Mirror Units, General: Fabricate frames for glass mirror units to accommodate wood, felt, plastic, or other glass edge protection material. Provide mirror backing and support system that will permit rigid, tamperproof glass installation and prevent moisture accumulation, as follows:
 - 1. Provide galvanized-steel backing sheet, not less than 0.034 inch (22 gage) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.
- D. Mirror Unit Hangers: Provide system for mounting mirror units that will permit rigid, tamperproof, and theftproof installation, as follows:
 - 1. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
- E. Keys: Provide universal keys for access to toilet accessory units requiring internal access for servicing, re-supply, etc. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install toilet accessory units according to manufacturers' instructions, using fasteners appropriate to substrate as recommended by unit manufacturer. Install units plumb and level, firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, according to manufacturer's instructions for type of substrate involved.
- C. Install grab bars to withstand a downward load of at least 250 lbf, complying with ASTM F 446.

3.2 ADJUSTING AND CLEANING

- A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.
- B. Clean and polish all exposed surfaces strictly according to manufacturer's recommendations after removing temporary labels and protective coatings.

END OF SECTION

SECTION 10 44 00 FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 SUMMARY

- A. Section Includes all labor & materials as required for complete installation of:
 - 1. Portable fire extinguishers.
 - 2. Cabinets in finished areas and where shown on drawings.
 - 3. Brackets w/ fire extinguishers in rooms where shown on drawings.
 - 4. Include all items necessary for the completion of work whether or not they are shown in the documents, but are necessary to provide the intended results.
- B. Related Sections:
 - 1. Section 04 20 00 Unit Masonry
 - 2. Section 09 21 16 Gypsum Board Assemblies

1.3 REFERENCES

- A. ASTM International (ASTM) E814 - Standard Test Method for Fire Tests of Through-Penetration Firestops.
- B. National Fire Protection Association (NFPA) 10 - Portable Fire Extinguishers.
- C. Underwriters Laboratories (UL):
 - 1. 154 - Carbon Dioxide Fire Extinguishers.
 - 2. 299 - Dry Chemical Fire Extinguishers.
 - 3. 626 - 2-1/2 Gallon Stored Pressure, Water Type Fire Extinguishers.
 - 4. 711 - Rating and Fire Testing of Fire Extinguishers.
 - 5. 1093 - Halogenated Agent Fire Extinguishers.

1.4 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate [cabinet] [bracket] locations and mounting heights.
 - 2. Product Data: Include data on extinguishers and cabinets, brackets, cabinet dimensions, operational features, materials, finishes, and anchorage.
- B. Closeout Submittals:
 - 1. Maintenance Data: Include test, refill, or recharge schedules and re-certification requirements.

1.5 QUALITY ASSURANCE

- A. Provide fire extinguishers complying with UL 711 and NFPA 10.
- B. Cabinets in Fire Rated Partitions: Tested in accordance with ASTM E814 with fire resistance rating equivalent to adjacent construction.
- C. Conform to applicable accessibility code for locating extinguishers.

1.6 PROJECT CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

1.7 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@LandAIA.com.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Ansul Incorporated, www.ansul.com
 - 2. JL Industries, www.jlindustries.com
 - 3. Larsen's Mfg. Co., www.larsensmfg.com
 - 4. Potter Roemer, www.potterroemer.com
 - 5. Prior Approved Equal in accordance with Section 10 25 00.

2.2 COMPONENTS

- A. Extinguishers:
 - 1. Multi-purpose dry chemical type, UL 299, stainless steel tank, Class 2A:10B:C10 pound nominal capacity
 - 2. Include Green Inspection Tag.
- B. Cabinets:
 - 1. Formed stainless steel 18 gage minimum.
 - 2. Configuration: Recessed sized to accommodate extinguishers.
 - 3. Trim: Flat trim
 - 4. Door:
 - a. Full glass style, equipped with recessed pull handle and keyed lock with emergency release or pull to break glass feature. Key locks alike; furnish six keys.
 - b. Hinge doors for 180 degree opening with continuous piano hinge.
 - c. Glazing: Clear tempered glass.
 - d. Graphics: Letter FIRE EXTINGUISHER vertically on door in red die-cut vinyl pressure sensitive letters.
- C. Wall Brackets: Formed galvanized steel, sized to accommodate extinguisher.

2.3 ACCESSORIES

- A. Mounting Hardware: Type best suited to application.

2.4 FINISHES

- A. Cabinet:
 - 1. Exterior and door: No. 4 satin finish
 - 2. Interior: Baked enamel, white.
- B. Cabinet: No. 4 satin.
- C. Brackets: Baked enamel, black.
- D. Extinguishers: Baked enamel, red color.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install cabinets and brackets in accordance with manufacturer's instructions.
- B. Set plumb, level, and rigid.
- C. Place an extinguisher in each cabinet and on each bracket.

END OF SECTION

SECTION 10 53 00 - ALUMINUM CANOPY SYSTEM
Roll Form & Insulated Deck

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK

A. Work in this section includes fully engineered system including furnishing of all materials, fittings, accessories, trim, labor, tools, and equipment for the complete installation of the walkway system (Insulated Deck for long spans)

1.03 RELATED WORK (Not Applicable)

A. Concrete: General Contractor shall block out openings in concrete slab at each column location.

1.04 QUALITY ASSURANCE

A. Manufacturer: Shall have a minimum of 10 years experience.

B. Installer: Shall have a minimum of five years experience. Installation shall be in accordance with manufacturer's shop drawings.

1.05 REGULATORY REQUIREMENTS

A. Cover shall conform to all building code requirements as listed on the Title Sheet.

1.06 FIELD MEASUREMENTS

A. Confirm field dimensions prior to preparation of shop drawings.

1.07 SUBMITTALS

A. Shop drawings shall be furnished for Architect's approval and general contractor's verification of all dimensions, elevations, and conditions prior to fabrication.

B. Certification: Submit written Certification prepared and signed by a Louisiana Registered Structural Engineer verifying that framing & rod design will safely resist wind uplift as computed by ASCE, as well as meeting wind & structural loading requirements of the International Building Code, latest adopted edition.

C. A Louisiana Registered Structural Engineer shall specifically design all new aluminum walkway covers, including hanger rods, columns and attachments to the concrete walkway slabs. All such design and submittals shall provide for all loads as indicated on the Drawings, shall be signed and sealed by a Louisiana Registered Structural Engineer.

1.08 DELIVERY, STORAGE, and HANDLING

A. Materials should be delivered and stored in a manner so as not to be damaged.

PART 2 - PRODUCT

2.01 DESCRIPTION

A. Aluminum walkway cover shall be roll form or insulated aluminum deck with baked on white or bronze finish. Provide fascia gutter with spouts.

2.02 MANUFACTURER

A. Walkway cover by East Texas Canopy, Ballews Aluminum Products, Mapes Industries, Inc.; Royal Aluminum; Peachtree, Precision Canopy, Morse Canopy or

approved equal.

- B. Provide column to column span as shown on drawing with 10'-0" max. span, not to exceed manufacturer's design limits. Deck spans shall not exceed manufacturer's design limits. Use 3" (.040 aluminum) insulated deck for deck spans greater than 10'-0". **Minimum Column size is 6" x 6" for Bookmobile Cover.**
- C. Make a watertight connection with flashing where new cover butts exterior wall or another canopy.

2.03 MATERIALS

- A. Post & beams shall be extruded aluminum as req'd by manuf. for loads & spans indicated. Decking, Fascia & gutter shall be roll form aluminum .025 or better. All
- B. Baseplate: Design & install baseplate for securement to existing concrete paving.
- C. Factory Finish: Clear, white or Bronze Anodized aluminum.

2.04 ROOF DECK

- A. Roof Panels shall interlock in a homogenous structural unit, with joint designed and fabricated into structurally rigid shape, which is self-flashing. Interlocking joints shall be fastened rigidly with fastenings which shall be 12" on center.
- B. Fastening may be by screws or rivets as required for securing to beams.
- C. Roof deck on simple spans of 15' or more shall be assembled with camber sufficient to neutralize deflection caused by the dead load of the material and to provide positive drainage from the center of the deck. No protruding ribs on the underside of the deck are permissible.

2.07 EXPANSION JOINTS

- A. Structure shall be designed for temperature changes of 120⁰ F., with expansion joints provided if required and shown on shop drawings. Such joints shall have no metal-to-metal contact between deck and beam or clamps.

2.08 SECTION PROPERTIES

- A. All extrusions shall be of dimensions shown on plans, and shall have minimum engineering properties shown in current manufacturer catalog for these sections.

2.09 FLASHING

- A. As needed for watertightness of canopy system and joint between canopy system and building.

PART 3 - EXECUTION

3.01 FABRICATION

- A. Material shall be fabricated from approved shop drawings, approved by the Architect and General Contractor. General Contractor shall field verify all elevations, dimensions and conditions prior to releasing for fabrication.

3.02 INSPECTION

- A. Confirm that surrounding area is ready for installation.
- B. Installer shall confirm dimensions and elevations to be shown on drawings provided by manufacturer.

3.03 DEMOLITION

- A. Remove existing materials where indicated and required for installation.

3.04 INSTALLATION

- A. Erection shall be performed by the manufacturer or his approved installer, and scheduled after all concrete, masonry, and roofing work in the vicinity is complete and cleaned.
- B. Installation shall be in strict accordance with manufacturer's shop drawings. Particular attention should be given to protecting the finish during handling and erection.
- C. Column sleeves, and anchor bolts if required, shall be furnished by the manufacturer and installed by the general contractor to elevations and dimensions on approved shop drawings. Columns and beams shall be aligned with care before columns are grouted. Downspout columns shall be filled to the discharge level to prevent standing water, and downspout deflectors installed after grouting.
- D. Recessed sleeves shall be filled with 2000# compressive strength grout. Mix by volume, 1 part Portland cement and 3 parts masonry sand. Add water to make pouring consistency and vibrate with a small rod to fill voids. Use an accelerator during cold weather.
- E. Extreme care shall be taken to prevent damage or scratching. All workmanship must be of the very best, with neat miters and fitted joints, as befits an ornamental structure.
- F. Isolate different materials such as aluminum deck on steel structure.
- G. After installation, the entire system shall be left in a clean condition.

3.05 WARRANTY

- A. Provide one year manufacturer's warranty including coverage of materials and workmanship.

END

SECTION 10 73 26 EXTRUDED ALUMINUM CANOPY SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes all labor & materials for the **extruded aluminum canopy systems**.
 - 1. Provide aluminum canopies including all necessary accessories to achieve configurations and profiles as indicated on the drawings and specified in this section.
 - 2. Work of this section includes design, fabrication, and installation of a complete watertight extruded aluminum walkway cover system with protective finish. Include flashings as required for watertight installation.
- B. Include all items necessary for the completion of work whether or not they are shown in the documents, but are inferable as being necessary to provide the complete system.

1.3 RELATED WORK SPECIFIED AND PERFORMED UNDER OTHER SECTIONS:

- A. Metal Fabrications as specified in Division 5.
- B. Flashing and sheet metal as specified in Division 7
- C. Joint Sealers as specified in Division 7.

1.4 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com. By submitting a bid, the sub-contractor accepts the plans & specifications as workable. The failure of the sub-contractor to request clarification or details 7 days prior to bids, shall not excuse improper installation and any correction shall be the responsibility of the contractor.

1.5 REFERENCES

- A. AAMA – American Architectural Manufacturers Association.
- B. Aluminum Design Manual 1994, Aluminum Association
- C. ANSI/ASCE 2002, Part 6, Wind Loads – Minimum Design Loads for Buildings and Other Structures.
- D. ASTM B221 – Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
- E. State Requirements for Educational Facilities (SREF) 1999.
- F. International Building Code 2003.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's product information, specifications and installation instructions for components and accessories.
- B. Shop Drawings: Confirm dimensions in the field prior to preparation of shop drawings. Submit complete erection drawings showing attachment system, column and gutter beam framing, transverse cross sections, covering and trim details, and option installation details to clearly indicate proper assembly of components. Detailed shop drawings & design calculations shall be submitted, sealed by a State Registered Structural Engineer.
- C. Certification: Submit written Certification prepared and signed by a Louisiana Registered Structural Engineer verifying that framing & design will safely resist wind uplift as computed by ASCE, as well as meeting wind & structural loading requirements of the International Building Code, latest edition.

- D. A Louisiana Registered Structural Engineer shall specifically design all aluminum walkway covers, including hanger rods, columns and attachments to the concrete walkway slabs. All such design and submittals shall provide for all loads as indicated on the Drawings, shall be signed and sealed by a Louisiana Registered Structural Engineer.
- E. Design and engineering of footings and attachment surfaces are not covered in this specification and scope of work.
- F. The indiscriminate submittal of general structural calculations that have not been specifically prepared for this project will be rejected.

1.7 QUALITY ASSURANCE

- A. Manufacturer to accept total responsibility, from structural design and engineering through fabrication finishing, delivery and erection by factory trained and certified mechanics. Manufacturer shall be a specialist with a minimum five years documented experience in manufacturing product. Installer shall be specialized with a minimum five years documented experience in erecting and applying the work, approved and certified by manufacturer.
- B. Size of members to be not less than those shown on drawings.
- C. Design Loads: Provide walkway cover structure capable of sustaining 90 MPH minimum wind load, and capable of supporting 45 psf live load on roof.
- D. Design each member to withstand stresses resulting from combinations of loads that produce maximum percentage of actual to allowable stress in that member.
- E. Confirm dimensions prior to preparation of shop drawings when possible.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and protect products as instructed by manufacturer.
- B. Promptly inspect shipment to assure the products comply with requirements, quantities are correct, and products are undamaged.
- C. Stack materials to prevent twisting, bending, or abrasion, and to provide ventilation.
- D. Slope metal sheets to ensure drainage.
- E. Prevent contact with materials during storage that may cause discoloration or staining.

1.9 WARRANTY

TWENTY-YEAR PAINT FINISH WARRANTY - Provide manufacturer's paint film written warranty for 20-Years against cracking, peeling, chalking and fading of the coating on fascia, trim, extruded panels, rods, and all components of aluminum walkway system. Warranty shall be signed by aluminum walkway cover manufacturer and state that the coating contains Kynar 500 or Hylar 5000 resin. Manufacturer warrants that coating shall not peel, crack or chip for 20-Years. For 20-years, chalking shall not exceed #8 ASTM and fading shall be 5△E color difference units or less.

MANUFACTURER'S 10-YEAR WEATHERTIGHTNESS WARRANTY - The entire aluminum canopy system (including deck, panels, trim, penetrations, flashing, curb, etc.) shall be guaranteed against water leaks and not allow intrusion of water from the exterior arising out of or caused by ordinary wear and tear by the elements for a period of Ten (10) Years. Warranty shall include all labor and material needed to repair or replace all leaking or defective materials in a timely manner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Basis of Design: System components from Mapes Industries are shown on the Drawings
- B. Subject to compliance with requirement, provide products by one of the following:
 1. American Walkway Covers, L.L.C (Hydroshield 635R)
 2. Dittmer Architectural Aluminum, (Ditt-Deck)
 3. Mapes Industries, Super Lumindeck Walkway Cover

- 4. Morse Canopies
- 5. Prior Approved Equal

2.2 SYSTEM DESCRIPTION

- A. Walkway covers shall be an extruded aluminum system complete with internal drainage in flat canopy configurations as indicated on the Drawings. **Roll form deck is not acceptable for this canopy.** Expansion joints shall be included to accommodate temperature changes of 120 degrees F.

2.3 MATERIALS

- A. Aluminum Columns, Beams and Tubing: alloy 6063, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T6.
- B. Deck Fasteners: 18-8 stainless steel screws, sealed with neoprene "O" ring beneath stainless steel; trim rivets may be aluminum.
- C. Columns shall be radius-cornered tubular extrusions with cutout and internal diverter for drainage.
- D. Wet beams shall be open-top tubular extrusions; top edges thickened for strength and designed to receive deck members in a self-flashing manner. Extruded structural rain cap ties shall be installed in the top of all wet beams.
- E. Deck shall be 2 3/4" extruded self-flashing .078 decking sections interlocking into a composite unit with sufficient camber to offset dead load deflection and cause positive drainage. Welded plates shall be used as closures at deck ends.
- F. Fascia shall be manufacturer's standard extruded J style in size as indicated on drawings.
- G. Aluminum column ends embedded in concrete shall be protected with clear acrylic enamel or other acceptable coating to prevent electrolytic reaction with concrete.
- H. Hanger rods and attachment hardware shall be powder coated to match canopy.
- I. Material Thickness: Provide minimum thickness of metal as follows:
 - 1. Beams: 0.125 inches on vertical faces and 0.190 inches on horizontal faces.
 - 2. Columns: 0.150 inches.
 - 3. Deck: 0.078 inches.
 - 4. Flashing: 0.032 inches.
 - 5. Fascia: 125 aluminum

2.4 FABRICATION

- A. Drainage: Water shall drain internally from deck to beams to columns, for discharge out rain diverters at or below ground level as indicated on architectural drawings.
- B. Bent Construction: Beams and columns shall be heli-arc welded into rigid, one-piece units in the manufacturer's plant. When size of system does not permit shipment, anodizing, or painted finish as welded units, mechanical joints shall be employed. Mechanical joints shall be of stainless steel bolts with a minimum of four bolts per fastening. Bolts and nuts shall be installed in a concealed manner utilizing 1/2" thick by 1-1/2" aluminum bolt bars welded to members.
- C. Pre Welded or Field welding is not permitted.
- D. Roof Deck: Extruded, self-flashing deck sections shall interlock into composite unit, spanning double-bays for superior loading.
- E. Welded dams shall be fabricated into the roof deck pans at all deck terminations.
- F. All connections shall be mechanically assembled utilizing 3/16" fasteners with a minimum shear stress of 350 lb. Pre-welded or factory-welded connections are not acceptable.

2.5 FINISHES

- A. Fluoropolymer Coating: 70 percent PVDF resin based fluoropolymer, AA-C-12C-42R-1, custom color with 3 coat application as selected by architect, comply with AAMA 605. Note that some canopies are a second color.

PART 3 -EXECUTION

3.1 PREPARATION

- A. Field verify column and beam location dimensions and elevations as shown on shop drawings prior to fabrication.
- B. Perform field modifications as may be required to provide the following:
 - 1. Proper transition from walkway cover to building.
 - 2. Flashing systems and provisions for expansion.

3.2 INSTALLATION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- B. Erection shall be performed by manufacturer-approved erectors and shall be scheduled for erection after all adjacent roofing and masonry have been completed.
- C. The manufacturer shall furnish Styrofoam block outs for the columns. Layout and installation shall be by the General Contractor to the dimensions and elevations shown on the approved shop drawings.
- D. Columns and beams shall be carefully aligned prior to installing into concrete mix.
- E. All deck ends and beam joints shall be capped as required to control drainage.
- F. Butt and miter joints shall be executed in a workman like manner.
- G. Walkway covers shall be erected true to line, level and plumb free from distortion or defects detrimental to appearance and performance.
- H. No exposed interlocking deck joints visible on the underside of the deck.
- I. Counter flashing at wall connections shall be installed under this section.

3.3 CLEANING

- A. Clean all walkway cover components promptly after completion.

3.4 PROTECTION

- A. Extreme care shall be taken to protect the finish from scratches, nicks, gouges, dents, concrete exposure, etc. during assemble and installation.

END OF SECTION

SECTION 11 31 00 - APPLIANCES

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.02 SCOPE

- A. Except where Owner is to furnish equipment, the Contractor shall furnish and install all equipment and specialties where indicated in Contract Documents. Include all related items and work necessary for a complete job according to manufacturer's latest printed specifications, instructions, drawings, recommendations.
- B. Where Owner is to furnish certain pieces of equipment, it will be assembled and set in place ready for connections. This Contractor shall verify exact type and location of services required, run such service and connect.

1.03 REQUIREMENTS

- A. Specialties shall be as specified or the latest of its kind available, furnished with all accessories needed for a complete job, installed according to manufacturer's specifications, recommendations. Manufacturers shall furnish diagrams, illustrations, explanations, job assistance for installation.
- B. Contractor shall provide all necessary blocking, anchorage, means of support whether detailed or not.
- C. Furnish shop drawings, submittals, colors finishes to Architect for approval.
- D. Equipment and Specialties shall be delivered to site, unpacked, assembled, marked and set in place ready for any connections by Mechanical and Electrical subcontractors. Demonstrate equipment and furnish parts manual to Owner. Mechanical and Electrical subcontractors shall run any water, gas, drain, electrical utilities and connect all such Specialties requiring service.
- E. Finished work shall be properly installed at recommended heights, securely attached with proper devices, level, plumb, square, perfectly fitted, in perfect working order, free of imperfections and clean.
- F. At completion of Project, furnish to Architect for Owner brochures, operating manuals, maintenance recommendations for all specialties.
- G. Contractor shall obtain exact location of these items before inside finish is installed and provide proper blocking.
- H. Provide residential type equipment which complies with standards and bears certification label from UL.
- I. All appliances must conform to requirements of ada standards for accessible design where applicable, relative to clear floor space, operable parts, operation, height above finished floor, controls, & reach ranges

PART 2 - PRODUCTS

2.01 **SEE EQUIPMENT SCHEDULE IN PLANS**

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with manufacturer's instructions and recommendations. Securely anchor units to supporting cabinetry with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.

END

SECTION 11 52 13 - PROJECTION SCREEN

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 SUMMARY

- A. This Section includes all labor & materials as required for complete installation of the following:
 - 1. New fixed front-projection screen in location(s) as shown on drawings. **(1 required Area 119)**

1.3 SUBMITTALS

- A. Product Data: For each type of screen indicated.
- B. Shop Drawings: Show layouts and types of projection screens. Include the following: Location of screen centerline relative to ends of screen case, location of seams in viewing surfaces, location of screens in relationship to beams, drop length, connections to supporting structure for recess-mounted screens, anchorage details, details of juncture of exposed surfaces with adjacent finishes, frame details, & accessories.
- C. Maintenance Data: For projection screens to include in maintenance manuals.

1.4 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.5 QUALITY ASSURANCE

- A. Single Source: Obtain projection screens through one source from a single manufacturer. Obtain each screen as a complete unit, including necessary mounting hardware and accessories.
- B. Screen shall be Fire Resistant, tested per NFPA 701 under large & small scale tests.
- C. Include all items necessary for the completion of work whether or not they are shown in the documents, but are inferable as being necessary to provide the intended results.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. New Products: Do not deliver projection screens until building is enclosed and other construction within spaces where screens will be installed is substantially complete and ready for screen installation. Store rear-projection screens in manufacturer's protective packaging and according to manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Draper Projection Screens\CES Company – Phone 707-664-9964, Fax: 707-664-9965, MODEL XT1000E, 16:10, 110v, Part No. 152101, 240 lbs., ceiling mount with ceiling box, ready to hang.
- B. Equal by Da-Lite Screen Company - Phone (800) 622-3737 · Fax: (574) 267-7804
- C. Prior approved equal.

2.2 FRONT- PROJECTION SCREENS

- A. Viewing Surface: Matte White
 - 1. Products: Subject to compliance with requirements, provide the following:

- B. Flame-Spread Index: Not greater than 75 when tested according to ASTM E 84.
- C. Seamless Construction: Provide screens, in sizes indicated without seams.
- D. Frame: 3/8" black extruded aluminum thin bezel frame visible from the front that attaches to hidden base frame. The face of the frame shall be less than 1 15/16" away from the wall, with a beveled edge. Base trim frame extrusions provide for up to 1 1/2" of horizontal & vertical surface tension adjustability in 3/8" increments. Frame equipped with mounting flange that mates with wall brackets.
- E. Size Schedule of Viewing Surface: HDTV Format (16:9) Black masking borders 161 inch diagonal, 79 inches x 140 inches. Rolled & sewn to form pockets along all four sides to accept screen insertion tubing for interface with frame attachment system.

2.3 PROJECTOR (by owner)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install projection screens at locations indicated to comply with screen manufacturer's written instructions.
- B. Coordinate layout and installation of projection screens with adjacent construction, including building structure, ceiling framing, light fixtures, HVAC equipment, fire-suppression system, and partitions.

3.2 PROTECTING AND CLEANING

- A. After installation, protect projection screens from damage during construction. If damage occurs despite such protection, remove and replace damaged components or entire unit as required to provide units in their original, undamaged condition. Use type of covering approved by screen manufacturer that will effectively protect screen from abrasion, breakage, or other damage.
- B. Use methods and cleaning materials recommended by screen manufacturer, taking care not to scratch or damage optical coatings or screen substrates.

END OF SECTION

SECTION 12 49 20 – MANUAL ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

- A. The general provisions of the Contract, including General and Supplementary Condition are hereby made a part of this section.
- B. Section Includes all labor & all materials, etc. as required for complete installation of :
 - 1. Manually operated window shades with all accessories for a complete installation. (Where indicated on Plans).
 - 2. Include all items necessary for the complete installation of work.
- C. Related Sections:
 - 1. Section 06 10 00: Rough Carpentry
 - 2. Section 08 41 13: Aluminum Storefront

1.2 REFERENCES

- A. National Fire Protection Association (NFPA) 701 - Fire Tests for Flame-Resistant Textiles and Films.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings:
 - a. Show locations, sizes, relationship to adjacent construction, and other pertinent information.
 - b. Use same room designations as indicated on Drawings.
 - 2. Product Data: Indicate components, materials, finishes, attachment, and operation.
 - 3. Samples:
 - a. 12 x 12 inch shade cloth samples in each color.
 - b. 3 x 3 inch paint samples in each color.
- B. Closeout Submittals:
 - 1. Operation and Maintenance Data.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 5 years documented experience in work of this Section.
- B. Fabric: Pass NFPA 701 small and large-scale vertical burn tests.
- C. Mockup:
 - 1. Size: One typical shade unit for each application.
 - 2. Locate where directed.
 - 3. Include window shade, operator, fascia and accessories.
 - 4. Approved mockup may remain as part of the Work if acceptable to architect and can be protected.

1.5 PROJECT CONDITIONS

- A. Verify dimensions at site prior to fabrication of shades.
- B. Do not install shades until painting and finishing work is complete and ambient temperature and humidity conditions are maintained at occupancy levels.
- C. After installation of metal studs and Prior to Gypsum Board installation, advise General Contractor of all required wood blocking needed for securing shade cassette to wall jamb.

1.6 WARRANTIES

- A. Furnish manufacturer's warranties beginning at Substantial Completion providing coverage for:
 - 1. 5 years against deterioration, sag, and warp of shade cloth.
 - 2. 5 years against defective hardware.
 - 3. 5 years against defective controllers.

1.7 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Lutron www.lutron.com
 - 2. MechoShade Systems, Inc. www.mechoshade.com
 - 3. Solarfective Products Limited www.solarfective.com
 - 4. Solar Shading Systems www.solarshadingsystems.com
 - 5. Hunter Douglas Contract www.hunterdouglascontract.com
 - 6. Prior Approved Equal in accordance with Section 01 25 00

2.2 MANUFACTURED UNITS

- A. Window Shades:
 - 1. Operation: Manual, by offset side mounted chain operator.
 - 2. Shade cloth orientation: Regular rolling with shade cloth falling on window side of roller.
 - 3. Mounting: to Wall Jamb at Exterior Curtainwall windows and to Aluminum Window frame Jamb at Interior Frames
 - 4. Head tube: Extruded aluminum.
 - 5. Fascia: Extruded aluminum.
 - 6. Provide block out side channels.
- B. Shade Cloth:
 - 1. Fabric hem pocket with RF-welded seams and hem weights concealed in continuous sealed hem pocket.
 - 2. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling.
 - 3. Provide battens when required to ensure proper tracking and uniform rolling of shade cloth.
 - 4. Fabricate shade cloth to completely fill openings from head to sill and jamb-to-jamb, unless otherwise indicated.
 - 5. Fabricate shade cloth to hang flat without buckling and distortion.

2.3 FINISHES

- A. Fabric: 10-12oz. vinyl & fiberglass weave, 10 percent openness factor, color to be selected from manufacturer's full color range.
- B. Aluminum: Baked enamel, color to be selected from manufacturer's full color range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide adequate clearances to allow for proper operation.
- C. Place units to locate shade cloth minimum 2 inches from interior face of glass.

3.2 ADJUSTING

- A. Adjust shades for smooth, quiet operation.

3.3 SCHEDULE

- A. See Floor Plans Sheets and Sheet A2.2 for opening sizes.
- B. See "Window General Notes" on Sheet A2.2 for locations & Window Elevations for sizes.

End of Section

SECTION 13 34 19 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.02 WORK INCLUDES

- A. Pre-engineered metal building, complete with structural framing (columns, rafters, struts, purlins, girts); pre-finished standing seam roofing panels, ridge cap, caps, fascias, soffits, closures, sealants, fillers, related flashing, siding; roof and wall insulation; building canopies; metal flashings; trim; gutters and downspouts; bracing; fasteners; ALL other components and material required for a complete warranted watertight installation.
- B. Includes new metal building system ARCHWAY with standing seam roof with 20 year weathertightness warranty.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal building systems capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Engineer metal building systems according to procedures in MBMA's (Metal Building Systems Manual).
 - 2. Design Loads: Apply the appropriate load combinations for this region as prescribed in the MBNA Recommended Design Practices Manual.
- B. Seismic Performance: Design and engineer metal building systems capable of withstanding the effects of earthquake motions determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures", Section 9, "Earthquake Loads".
- C. Thermal Movements: Provide metal panel systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
- D. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for Class 90 or local area wind zone per 2021 IBC if more stringent.

1.04 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/architect at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.05 QUALITY ASSURANCE OF MANUFACTURER

- A. Codes and Standards:
 - 1. Use following where applicable in building design:
 - a. AWS D1.1 "Structural Welding Code-Steel".
 - b. International Building Code, 2021 Edition (IBC 2021).
 - c. AISI "Specifications for the Design of Cold Formed Steel Structural Members", latest edition.
 - d. AISC "Manual of Steel Construction" and "Specification for Structural Steel

Buildings". Allowable Stress Design and Plastic Designs, 9th Ed.

- e. Metal building manufacturer shall be certified in accordance with American Institute of Steel Construction (AISC) quality certification program category MB for Metal Buildings. This certification is to cover areas of general management, architecting and drafting, procurement, operations and quality control. Upon request the manufacturer shall provide proof of certification.
 - f. Metal building manufacturer shall be a member of the Metal Building Manufacturer Association.
 - g. AAMA "Aluminum Construction Manual".
 - h. SJI "Standard Specifications, Load Tables and Weight Tables".
 - i. AISC "Specification for Structural Joints using ASTM A325 or ASTM A490 bolts".
 - j. SDI "Steel Roof Deck Design Manual".
 - k. U.S. Army Corps of Architects - Standing Seam Metal Roof (SSMR) Specification CEGS416.
2. Use the following where applicable in other phases of design:
 - a. Building Code and regulations of other governing authorities having jurisdiction at Project Site.
 - b. Applicable portions of the Structural Painting Council (SSPC) Standards, as referenced herein.
 - c. Federal (Fed. Spec.), Military (MIL) and Commercial (CS) Standards and Specifications, as referenced herein.
 - d. American Society for Testing and Materials (ASTM) Standards, as referenced herein.
 - e. Ratings and Approvals by:
 - 1.) Underwriter's Laboratories, Inc. - UL-90 Rating

B. Design Loads:

1. International Building Code (IBC) 2021.
2. Roof Live Loads: As follows, to be in addition to applicable dead loads and applied to horizontal projection of roof:
 - a. Purlins and Roof Joists: Design for 20 PSF uniformly distributed over roof area, which they support.
 - b. Primary Framing (Frames): Design for 20 PSF uniformly distributed over roof area, which they support with reduction as allowed per IBC 2021.
3. Roof Snow Loads:
 - a. The ground snow load for the building location is 5 PSF.
 - b. Roof snow loads shall be determined and applied per IBC 2021.
4. Miscellaneous:
 - a. Roof Covering: Design to support either 50 PSF uniformly distributed or 200 lbs. concentrated (point) load (over 1' x 1' area) located at center of maximum roofing (panel) span; most severe condition shall govern.
5. Roof Collateral Loads:
 - a. Design all primary and secondary framing components for a 10 PSF uniform mechanical/suspended ceiling load.
 - b. Design structure to support other concentrated loads such as mechanical and electrical equipment, basketball goals or stage curtains where indicated.
6. Wind Loads: Design structure for cities' listed velocity proportioned and applied as horizontal and uplift forces according to IBC 2021. Wind Exposure B, Occ. Cat. 3.
7. Seismic Loads:
 - a. Seismic loads shall be determined and applied per IBC 2015.
8. Horizontal deflections of sheeting, secondary and primary structural framing, under full design wind pressures in combination with other applicable loads, shall be as follows: Lateral sidesway - frames, "H"/300; Longitudinal sideways - bracing, "H"/300; Wall Panels, "L"/120; Girts, "L"/300; Wind Beams "L"/300; Endwall Columns, "L"/300.

- C. **Manufacturer's approved** are Butler Building Systems, Englert, Varco-Pruden, American Buildings Company, Star Building Systems, Whirlwind, AIM, Delta Consolidated, Ideal Steel, Mesco, Pinnacle or equals per Section 01 25 00. The following manufacturers are approved with MBCI Roof Panel and Warranty: CECO, Pinnacle, Ruffin (Mueller) or approved equal. Other manufacturers seeking approval must submit in accordance with Division 1 and include copy of proposed water tightness warranty. All above listed manufactures are approved contingent on having a water tightness warranty equal to MBCI 20 Year Single Source II Warranty. **Roof color shall be bright red.**
- D. **Single Source Responsibility:** All work under this Section shall be under one (1) sub-contract with all structural elements and all panels, fasteners and accessories provided as one (1) total package. The structural system may be one (1) manufacturer's product and the wall and roof panels and trim be supplied by another manufacturer, provided the whole system of complete buildings shall be submitted as a complete set of Shop Drawings by one (1) single responsible Contractor.
- E. Manufacturer's Field Service (Required for Standing Seam and Screw Down Roofing Systems)
1. During installation, provide for two on-site inspections of roof application BY qualified technical representative of the manufacturer.
 2. Upon completion of installation, provide final third inspection by a technical representative of roofing manufacturer to confirm that roofing system has been installed in accordance with manufacturer's requirements.

1.06 QUALITY ASSURANCE OF ERECTION CONTRACTOR

- A. Erector Qualifications: An experienced erector who has specialized in erecting and installing work similar in material, design and extent to that indicated for this Project who is acceptable to manufacturer. The manufacturer shall provide a letter certifying that erector complies with manufacturer's requirements.
- B. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.
1. AISC Certification for Category MB: An AISC-Certified Manufacturer that designs and produces metal building systems and components in an AISC-Certified Facility.
 2. Architecting Responsibility: Preparation of Shop Drawings and comprehensive architecting analysis by a qualified professional architect.
- C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel" and AWS D1.3, "Structural Welding Code-sheet Steel".
- D. Structural Steel: comply with AISC's "Specification for Structural Steel Buildings-Allowable Stress Design, Plastic Design" or "AISC's "Load and Resistance Factor Design Specification for Structural Steel Buildings" for design requirements and allowable stresses.
- E. Cold-Formed Steel: Comply with AISI' "Specification for the Design of Cold-Formed Steel Structural Members" or AISI's "Load and Resistance Factor Design Specification for Steel Structural Members" for design requirements and allowable stresses.

1.07 COORDINATION

- A. General Contractor's Superintendent shall review all work indicated by all trades including mechanical, electrical and foundation. He shall verify all dimensions, foundation requirements and indicate any changes to metal building dimensions or foundation on Shop Drawings.

1.08 SUBMITTALS

- A. General: To Comply with General Conditions.
- B. Shop Drawings and Calculations:

1. Design Calculations and Erection Drawings: Prepared by, or under direct supervision of, Registered Professional Engineer, licensed to practice in the State of Louisiana with all drawings and calculations bearing his seal, signature and date.
 2. Show each type structural building frame required and their locations within structure; details of anchor bolt settings; anchor bolt layout (dimensioned) drawing; sidewall, end wall and roof framing; diagonal bracing and locations within structure; metal floor deck and joist types; wall and roof insulation and types; longitudinal and transverse cross sections; details of curbs, roof jacks and items penetrating roof; canopy framing and details; trim gutters, downspouts, typical valley, liner panels, wall and roof coverings, and all accessory items; materials; finishes; construction and installation details; and other pertinent information required for proper and complete fabrication, assembly and erection of watertight metal building system. Furnish actual sample of such items as trim, valley and fascia when requested.
 3. Submit six (6) copies of drawings and two (2) copies calculations for approval. Fabrication shall not proceed until approval is granted.
- C. Material and Color Samples:
1. For each specific material sample requested by Architect, submit in size, form and number directed.
 2. Submit duplicate color chip sample sets showing color range available to match existing roof panels, for selection purposes.
- D. Product Data: Two (2) copies of manufacturer's specifications and descriptive literature.
- E. Certification: Two (2) copies of written certification, prepared and signed by Registered Professional Engineer licensed to practice in the State of Louisiana, attesting:
1.
 - a. Name and location of Project
 - b. Order number
 - c. Name of manufacturer
 - d. Name of Contractor
 - e. Building dimensions, including width, length, height and roof slope
 - f. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
 - g. Governing building code and year of edition
 - h. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic zone or effective peak velocity-related acceleration/peak acceleration and auxiliary loads
 - i. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
 - j. Building-Use Category: Indicate category of building use and its effect on load importance factors.
 - k. AISI Certification for Category MB: Include statement that metal building system and components were designed and produced in an AISC-Certified Facility by an AISC-Certified Manufacturer.
 2. Erector Certificates: Signed by manufacturer certifying that erectors comply with requirements.
 3. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements or Specifications. Include evidence of manufacturing experience.
- F. Metal building manufacturer shall submit certification and that the roof system shall qualify for FM Class 1-90 and state construction number.

1.09 PRODUCT HANDLING, DELIVERY AND STORAGE

- A. Deliver and store prefabricated components, sheets, panels and other manufactured items so they will not be damaged or deformed.
- B. Stack materials on platforms or pallets above grade or on concrete slab, covered with opaque tarpaulins or other approved weather-resistant ventilated covering.
- C. Store metal sheets and panels if subjected to water accumulation in such a manner so

they will drain freely. Do not store sheets and panels in contact with other materials, which might cause staining.

- D. Damaged material must be reported to determine if replacement is required.
- E. Inspect panels to prevent moisture between panels, and secure as required.

1.10 WARRANTIES

(Shall be based on MBCI Single Source II Warranty Program.)

INSTALLER'S FINISH WARRANTY - 2-Year Labor and Material Warranty Against Leaks By Installation Contractor.

MANUFACTURER'S WARRANTY - Roof panels and wall panels shall be covered by a 20-Year Paint Finish Warranty and 20-Year No Dollar Limit Weather-tightness Warranty equal to MBCI Single Source II Warranty.

TWENTY-YEAR PAINT FINISH WARRANTY - Provide manufacturer's standard paint film written warranty for 20-Years against cracking, peeling, chalking and fading of the coating on painted wall panels, painted roof panels and soffits panels. Warranty shall be signed by building system or roof system manufacturer and state that the coating contains Kynar 500 or Hylar 5000 resin. Manufacturer warrants that coating shall not peel, crack or chip for 20-Years. For 20-years, chalking shall not exceed #8 ASTM and fading shall be 5 Δ E color difference units or less.

MANUFACTURER'S 20-YEAR NO DOLLAR LIMIT WEATHER-TIGHTNESS WARRANTY - Notwithstanding the requirements of these Specifications regarding warranties, the entire metal building roof system (including exterior shell, panels, trim, penetrations, flashing, curb, etc.) shall be guaranteed against water leaks and not allow intrusion of water from the exterior arising out of or caused by ordinary wear and tear by the elements for a period of Twenty (20) Years. Warranty shall include all labor and material needed to repair or replace all leaking or defective roof materials in a timely manner. Warranty shall be equal to MBCI Single Source II.

The Roofing Manufacturer shall have the SOLE AND EXCLUSIVE obligation to provide warranty work commencing on the date of Substantial Completion and under all circumstances terminates on the 20-Year anniversary of the date certified as Substantial Completion. During the period in which the roofing manufacturer has any warranty obligation, the roofing manufacturer shall take appropriate actions necessary to cause the non-performing portions of the Roof System to perform their proper functions.

PART 2 - PRODUCTS AND FABRICATION

NOTE: This Section is based on Butler Building Systems to establish basis of quality and type of finish. SEE 1.04 C for equals.

2.01 STRUCTURAL STEEL

A. Materials:

1. Structural Plate, Bar Stock and hot-rolled shapes: Minimum yield strength (Fy) of 50,000 PSI.
2. Cold Formed Structural Steel: Minimum yield strength (Fy) of 55,000 PSI.
3. Primary Structural Bolts and Nuts: ASTM A325; size and quantity as required by analysis. Secondary Connections: ASTM A 307 or A 325 as required by analysis.
4. Prime Coat Paint: Manufacturer's standard equal to Fed. Spec. TT-P-636D.
5. Steel Joists:
 - a. Type and Size: Open web type in series and sizes shown on Drawings, with and without extended ends or bottom chords as shown, designed to support loadings shown on Drawings or Specified.
 - b. Accessories: Provide wall anchors, bearing plates, ceiling extensions, beam

bolts and other accessories necessary or required for complete installation.

c. Prime Coat Paint: Manufacturer's standard.

B. Fabrication:

1. Primary Framing: Rigid frames of shop-welded steel plate columns and rafters, both tapered and uniform depth sections as required, complete with all necessary stiffeners, connection plates and holes for field-bolted assembly.
 - a. Columns and Rafters: Fabricated with holes in web and/or flanges for attachment of secondary members. **Some Columns this project may have uniform depth for a height if noted on plans.**
 - b. Splice Plates: factory fabricated for precision for all rafter-to-rafter and/or column-to-rafter connections, complete with connection bolt holes.
 - c. Base Plates, Cap Plates, Splice Plates and Stiffeners: Fabricate to sizes required, complete with all holes for connection of primary and secondary structural members. Factory weld into place.
 - d. Join flanges and webs of structural members fabricated of plate or bar stock together by continuous automatic submerged arc welding process with all welding performed under the supervision of certified welders in accordance with standard practices of AWS D1.1.
 - e. Make all primary rigid frame field-bolted connections with A325 high-strength bolts of size required by building system manufacturer.
 - f. Clean all components of oil, dirt, loose scale and foreign matters. Factory paint with one (1) coat of manufacturer's standard primer.
2. Endwall Framing: Precision cold-formed and/or shop-welded steel plate members consisting of rafters and columns fabricated for field-bolted assembly.
 - a. Columns, Rafters, Splice Plates, Clips, Angles and Channels: Factory fabricate to size required.
 - b. Plate Stock Endwall Framing Members: Join flanges and webs by continuous automatic submerged arc welding process, under the supervision of welders certified in accordance with standard practices of AWS D1.1.
 - c. Clean components of oil, dirt, loose scale and foreign matter and apply one (1) coat of manufacturer's standard primer.
3. Secondary Framing, (Purlins, Girts, Struts, Flange Braces, Base Angles, wall or roof opening framing as required): Provide additional purlins and space closer together as required for roof mounted equipment and lengthy overhang at rake. Provide deeper purlin if required for span length.
 - a. Purlins: Manufacturer's standard Z sections, roll formed from minimum (Fy) 55,000 PSI steel, punched for attachment.
 - b. Girts: Z or channel sections of roll formed Fy 55,000 PSI steel, punched for attachment with 2, ½" diameter bolts minimum.
 - c. Eave Struts: sections of cold formed minimum Fy 55,000 PSI steel, with vertical web to receive sidewall panels and four (4) ½" diameter bolts attaching to rigid frame in factory-punched holes in column or bracket.
 - d. Roof Struts: Provide as required, detailed and shown on final shop drawings, as required by design analysis, with attachment to top flange or rigid frame rafters by two (2) ½" diameter bolts at each end of strut, minimum.
 - e. Flange Braces: Steel angles attached to purlin or girt, to stiffen rigid frame flanges as dictated by design and noted on final shop drawings.
 - f. Optional Base Angle for Wall Panels: 3" x 2" x 0.071" angle of commercial grade steel, for field attachment to foundation with approved type drive anchors.
 - g. Clean secondary framing components to be free from oil, dirt, loose scale and foreign matter and apply one (1) coat of manufacturer's standard primer.
4. Anchor Bolts: The anchor bolts shall be provided by the building manufacturer and designed to resist the maximum column reactions resulting from the specified combination of loadings. These designs and sizes shall be specified

by the building manufacturer.

5. Steel Joists:
 - a. Fabricate in accordance with SJI Standard Specifications, except modify design as required to allow compression loads to be carried in top chord and diagonals. The design is also modified to accommodate wind uplift. Verify dimensions and job conditions prior to starting fabrication.
 - b. Moderate camber acceptable to accommodate for dead load deflection.
 - c. Provide extended top or bottom chords where indicated on drawings.
 - d. Clean, prepare and shop prime joists.
 - e. Joists to be (field welded) (bolted) in place.

2.02 ROOFING & SIDING

A. Roofing and Siding Panels: ASTM A526-80, Grade A, G90 zinc coated galvanized steel.

1.
 - a. Curved Panel per plans equal to MBCI Curved Battenlok. See paragraph 1.05 c above for Equals.
 - b. Roof Panel material shall be 24 gauge galvanized (G-90 coating), per ASTM specification A653 (G-90), and painted with exterior colors Equal to MBCI finish system, a full strength 70% Kynar 500® or Hylar 5000® fluoropolymer coating. Manufacturer warrants that coating shall not blister, peel, crack, chip or experience material rust through 20 years. For a period of 20 years chalking shall not exceed #8 - ASTM and fading shall be 5ΔE Color Difference Units or less.
 - c. Panel of maximum possible length shall be used to minimize end-lap; eave panel shall extend beyond the structural line of the sidewall.
 - d. Panel end splice shall be factory punched and pre-notched. Panel end splice shall be floating and allow the roof panel to expand and contract with roof panel temperature change.
 - e. Ridge assembly shall be designed to allow roof panels to move lengthwise with expansion/contraction as the roof panel temperature changes. Parts shall be factory punched for correct field assembly. Panel closure and interior reinforcing strap shall be installed to seal the panel end at the ridge. The attachment fasteners shall not be exposed on the weather side. A lock seam plug shall be used to seal the lock seam portion of the panel. A hi-tensile steel ridge cover shall span from panel closure to panel closure and flex as the roof system expands and contracts.
 - f. Valley Flashing shall be watertight with sections secured to substrate, lapping sections 8" minimum. Metal roofing panels shall overlap into the hemmed valley flashing with no fasteners within the valley flashing.
 - g. **Provisions for expansion/contraction of all materials in all directions shall be addressed by manufacturer and shall be manufacturer's responsibility. System shall be designed to absorb differential movement between each roof, between the roof and adjacent structures, and between the roof and supporting structures. Hips, valleys, ridges, etc., shall have expansion capabilities.**
 - h. No exposed fasteners allowed on roof panels. The panels shall be secured to the structure with concealed clips, either fixed or floating, designed to accommodate 2" of panel expansion/contraction. The clip shall be made of 26-gauge steel, minimum yield of 50 ksi, coated with G-90, meeting ASTM A446. Perimeter trim, ridge cover and transition flashing shall be provided and shall be designed to accommodate the roof's expansion/contraction. Panels shall be joined watertight with electrically operated field seaming equipment. Sealants and fasteners shall be provided as required for a weather-tight installation.

2. Exterior Wall Panels: Equal to MBCI PBR 24 ga. with exposed fasteners. See

paragraph 1.05 c above for Equals.

- 3. Panel Finishes:
 - a. Roof Panel: Manufacturer's standard G-90 galvanized coating with color (20-year warranty) full 70% polyvinylidene fluoride (Kynar) finish. Color to be selected.
 - b. Architectural Wall Panels: Full 70% polyvinylidene fluoride (Kynar) finish.
- 4. Soffit Panels: .025" x 12" wide (concealed fastened) aluminum ribbed vented (where shown) panels. Non Vented Artisan 1 Series soffit panel equal to MBCI. Where curved soffit is shown under Front Canopy, use material equal to MBCI Flexloc soffit panel installed parallel to curved surface. See paragraph 1.05 c above for Equals.
- 5. ~~Interior Wall Liner Panel: .024 aluminum, 2" x 16" or 1"x12" flat perforated panel with concealed fasteners. Include 2" fiberglass insulation for sound.~~
- 6. Standing Seam Sealant: Approved type non-shrinking, non-drying butyl-based sealant specifically formulated for factory application in standing seams and to allow roof panel assembly at temperatures from minus 10 degrees F to 140 degrees F.
- 7. Roof Panel Sealant: Approved type, non-shrinking, non-drying butyl-based sealant, specifically formulated for roof application at temperatures from 20 degrees F to 120 degrees F.

2.03 WIND BRACING

- A. Commercial grade steel rod or cable bracing, wind columns or portal frames located as shown on the design drawings and at locations approved by Architect.
 - 1. Steel Rod or Cable Bracing: Provide complete with necessary slope washers, flat washers and adjusting nuts at each end. NO cable or rod bracing allowed in wall.
 - 2. Wind Columns/Portal Braces: Provide wind columns, portal braces or portal frames where required.
- B. Clean components free of oil, dirt, loose scale and foreign matter.
- C. Portal bracing beam shall be located as high as possible so that it does not interfere with finished areas.
- D. All rod bracing & portal bracing shall not be exposed to view in any finished area.

2.04 WALL AND ROOF INSULATION – **NOT REQUIRED**

- A. ~~Wall and Roof Fiberglass Insulation:~~
 - ~~1. Roof – See Section 13 35 00 or 07 21 30 for double insulation equal to Simple saver.~~
 - ~~2. Walls – Areas without CMU, use Simple saver" vinyl faced fiberglass insulation by Section 13 35 00 or 07 21 30. Insulate all exterior walls above ceilings due to Sprinkler Sys.~~
 - ~~3. Provide polystyrene thermal block between roof panel and purlins. Clip between all purlins and roof panels shall be expansion type to allow horizontal movement to prevent thermal shock.~~
 - ~~4. Provide insulation and facing (as a composite material) carrying UL fire hazard (UL 723) rating indicating a flame spread rating of 15 or less; or FM classification as Class 1 material when rating is applied to each individual component if field assembled, or to composite unit if supplied factory assembled. All faced insulation in concealed spaces shall have a heat content of the facing and substrate that does not exceed 4000BUTH/SF.~~

2.05 ACCESSORIES

NOTE: The roof curbs, penetrations and flashings shall be the responsibility of the MBM and provided by metal building manufacturer as required for complete watertight system and warranties as specified.

- A. GUTTERS AND DOWNSPOUTS: (only where indicated on elevations or detail).
 - 1. Gutters for standing seam roof shall be suspended box sections of 24-gauge-

galvanized steel formed to match the configuration of the gable trim. Gutters shall be independent of the roof seal and shall be attached to the eave strut adapter by means of a gutter hanger.

Gutter hangers shall be spaced at 3'-0" centers and attached to inside face of gutter and eave adapter by #12 self-drilling screws and to outer face of gutter by trim fasteners.

Gutter sections shall be lapped 2" and sealed with sealant and then fastened with fasteners as specified on manufacturer's drawings. Gutter end closures shall be sealed with sealant and fastened with pop rivets as specified on manufacturer's drawings.

2. Downspouts shall be 24-gauge galvanized factory-colored steel with a minimum cross section of 20 square inches, but manufacturer shall size gutters, valleys, downspouts for 100-year rain intensity at the Project's location site. Downspouts shall be located according to design requirements as specified but no less than 24 feet o.c.

Downspouts shall be attached to a thimble installed in the gutter. Downspouts shall be attached to the wall panel using 3 - 24-gauge galvanized factory-colored steel straps on 10'-0" centers. A 75-degree elbow shall be provided at the base of all downspouts to direct the water flow away from the building.

3. Finish: Manufacturer's standard siliconized polyester system finish in color as selected by Architect, guaranteed not to fade, chip or peel for 20-years.
- B. TRIM FASTENERS: Fasteners shall be 1/8" diameter dome head blind rivets x .125 grip range with cadmium plated steel rivet body mandrel
- C. ROOF CURBS: Furnish and install all raised custom fabricated curbs with built-in water diverter for standing seam roof penetrations and vents. Coordinate size required by all mechanical and electrical equipment prior to Shop Drawing submittal. Furnish and install all steel support, bracing, etc. as required for complete support and installation of roof mounted equipment and roof curbs. See Mechanical and Electrical Drawings and Specifications for additional requirements.
- D. PANEL CLOSURE: Closed cell performed laminated polyethylene or neoprene closure matching the configuration of the covering. Shall be provided in conformance with building manufacturer's standard practice at all eaves and where indicated on the Drawings.
- E. OVERHEAD DOORS AND SLIDING DOORS - Not required.
- F. LIGHT TRANSMITTING PANELS: Not required.
- G. VENTILATORS, LOUVERS, ROOF JACKS AND PIPE FLASHING:
1. Roof jack shall be a 26-gauge, Shell White steel cone factory installed and sealed to roof panel. Cone shall be made of same material.
 - a. Stack or pipe penetration shall be at the centerline of a major corrugation of the roof panel.
 2. Pipe flashing shall consist of a molded rubber cone with an aluminum ring bonded to the base. Pipe flashing shall accommodate pipe diameter as specified and be capable of flashing penetration at any location of the roof panel. Flashing shall be sealed and fastened in accordance with manufacturer's drawings.
- H. SEALANTS

Closure Strips: The corrugations of the roof and wall panes shall be filled with solid or closed-cell, preformed rubber or neoprene closures along the eave, ridge and rake when required for weather-tightness.

Metal Closures: The corrugations of the Standing Seam Roof Panel shall be filled with a

formed metal closure at the building eave. The closure shall be formed from 20 gauge aluminum coated material to the shape of the panel rib.

Sealer Standing Seam Roof Panel side laps shall have factory applied mastic, Chemseco Sealum SM-603 or equal. its composition shall be 90% solids by weight. Service temperature range shall be -20°F to +200°F.

All Standing Seam Roof panel end laps, ridges and eave closures shall be sealed with ¾" x 3/16" tape mastic, Schnee-Morehead #5225 or equal. The material shall be non-staining, non-corrosive, non-shrinking, non-oxidizing, non-toxic and non-volatile. Composition shall be 99% minimum solid with a butyl base meeting performance of Mil-C-18969, Type II, Class B and Federal Specification TT-C-1796A and AAMA 804-1. Service temperature shall be -40°F to +300°F.

Caulk: All gutter and downspout joints, rake flashing laps, ridge flashing laps, doors, windows and louvers shall be sealed with white or burnished slate pigmented acrylic based caulk, Schnee-Morehead #5522 or equal. It shall meet or exceed the requirements of AAMA Specification 802.3, Type I, ANSI-A-134.1, ANSI-A134.2 and ANSI-A134.3.

I. FASTENERS

Concealed fasteners for standing seam - self tapping, carbon steel, No. 12 x 1" hex head with washer.

Exposed fasteners for screw down - self tapping, carbon steel, No. 12 x 1" hex head with ½" diameter washer and protective metal cap to prevent over tightening.

PART 3 - EXECUTION

3.01 ERECTION

A. General:

1. Erection shall be accomplished by a trained, competent erector having experience in erecting metal buildings.
2. Install all metal building system components in strict compliance with manufacturer's instructions shown on final shop drawings.
3. Handle and store all materials to avoid damage and replace any damaged materials.
4. Erector shall observe and follow recommendations of the Metal Building Manufacturers Association (MBMA) practice and procedures where applicable.
5. Do not field cut or alter structural members without approval from manufacturer.

B. Structural Frames:

1. Erect true to line, level and plumb, brace and secure with temporary bracing in all directions as required.
2. Level base plates and secure to anchor bolts to level plane with full bearing to foundation supporting structures.

C. Steel Joists:

1. Place and secure in accordance with requirements of SJI Specifications and final shop drawings.
2. Place on supporting work, adjust and align in accurate locations and spacing before permanently bolting or welding in final location.
3. Install bridging and flange braces simultaneously with joist erection before any construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at wall or beams. Install bridging, connections and anchor to ensure lateral stability during construction.

D. Bracing:

1. Install all permanent diagonal rod or angle bracing in roof as approved by manufacturer.
2. Properly tighten rods to avoid excessive sag.

3. Bracing: Visible or exposed wall bracing not allowed in finished areas.
- E. Framed Openings:
1. Securely attach to building structural framing members, square and plumb.
- F. Roofing and Siding Panels:
1. General:
 - a. Install roof and canopy panels in such a manner to permit drainage to eaves of building, with panel ends square to eave.
 - b. Install wall panels with vertical edges plumb.
 - c. Arrange and nest side lap joints away from prevailing winds when possible.
 - d. Apply panels and associated items for neat and weather-tight enclosure.
 - e. Avoid "panel creep" or application not true to grid lines.
 - f. Protect factory finishes from mechanical damage or abrasions.
 - g. Install approved type closures to exclude weather.
 - (1) Install weather seal under ridge cap. Flash and seal roof panels at eave, gable and perimeter of all openings through roof and elsewhere as required or shown on drawings.
 - (2) Flash and/or seal wall and liner panels at perimeter of all openings, under eaves and gable trims, along lower panel edges, and elsewhere as required or shown on drawings, as applicable.
 - h. Remove all fastener or cutting shavings from roof and wall as erection is completed.
 2. Standing Seam Roof Panels:
 - a. Install panels with positive interlock between installation clips and standing seams in manner that will allow panels to support erection loads prior to closing of seams with seamer.
 - b. Install concealed panel clips (of sliding design to allow for expansion and contraction movement of panels) over top of roofing insulation along each standing seam at location and spacing determined by metal building manufacturer.
 - c. Where panel end splices occur, nest panels with 3" end laps and install interlocking clamping plates and sealant. Make splice independent of structure to allow for free expansion and contraction movement of panels without stress on splice.
 - d. Crimp standing seams with approved type motorized seamer tool to assure complete sealant engagement and to assure structural integrity of panel-to-panel and panel-to-clip connections.
 - e. Use fasteners penetrating roof panel only at eaves and end splices (when required). At these conditions, use fasteners in conjunction with clamping plates (with factory-punched holes to assure correct fastener placement) and approved type butyl sealant to assure positive watertight seals.
 - f. Install ridge cover units of approved expansion joint design to accommodate expansion and contraction movement of roof panels without ponding at end splices.
 - g. Coordinate installation of accessories and items to be mounted on metal roofing.
 - h. Maintain proper panel coverage of 2'-0" per panel.
 3. Wall Panels:
 - a. Install wall panels on exterior side of metal framing.
 - b. Align bottoms of panels to proper coverage and fasten with manufacturer's recommended and supplied fasteners.
 - c. Cut and fasten flashing and trims with approved type fasteners.
 - d. Install all fasteners with power tool having adequate torque and proper r.p.m. adjusted to seat fastener without damage to heads, washers or panels.
 - e. Install panel side lap away from prevailing wind or view direction when possible, maintaining proper lap without fastener dimpling or excessive overlap.

- G. Accessories: Install gutters, downspouts, flashings, trim, ridge covers, roof curbs, pipe flashings, closure strips, roof jacks, and other accessories and sheet metal items in accordance with manufacturer's recommendations for positive attachment to building and provide a weather tight mounting.
- H. Swing Doors and Frames: Install doors and frames straight, plumb, and level. Securely anchor frames to building structure. Set units with 1/8" maximum clearance between door and frame at jambs and head, and 3/4" maximum between door leaf and floor. Adjust for proper operation.
- I. Louvers:
 - 1. Install plumb and level, in compliance with requirements of final shop drawings. Anchor securely in final location with perimeter sealed with approved sealant used for trim and flash or roof panels. Adjust louver blades to operate smoothly and easily, without binding, and to be weather tight when in closed position.
- J. Thermal Insulation:
 - 1. Install in accordance with manufacturer's recommended procedure, performed concurrently with installation of wall and roof panels,
 - 2. Roof and Wall Insulation: Install blankets straight and true. Fasten tabs together or lap and glue to provide complete vapor barrier. Place insulation with facing exposed to interior of building unless recommended otherwise.

3.02 PAINTING

- A. Touch-up all abrasions, scratches, field welds or other damages in shop-primed or factory-finished painted surfaces consistent with shop primer or factory-finished painting.
- B. Apply finish paint coats to factory-primed items.
 - 1. Provide finish coats, which are compatible with metal building manufacturer's prime coat paints.

3.03 TOLERANCES

- A. All framing members shall be erected plumb, level or aligned not to exceed a deviation 1:300.

3.04 WARRANTY

- A. 2 Year Contractor and 20 Year Manufacturer Water-tightness Guarantee equal to MBCI Single Source II is required.

END OF SECTION

SECTION 14 21 00 (14 21 23) - ELECTRIC TRACTION PASSENGER ELEVATORS

PART 1 – GENERAL

The general provisions of the Contract, including General and Supplementary Conditions, are hereby made a part of this Section.

1.1 SECTION INCLUDES

A. Electric traction passenger elevators.

1.2 DESCRIPTION OF WORK

- A. Elevator Contractor shall furnish Non-Proprietary equipment including all Engineering, labor, tools, materials, fixtures, equipment, accessories, car enclosures, doors and door frames, access control, elevator cabs, transportation, non-proprietary microprocessor controllers, motors, battery powered UPS lowering rescue feature, any low voltage elevator wiring, including all electrical and mechanical systems including necessary auxiliaries, etc., to complete the electric traction elevator installation as required by this specification that meets or exceeds the requirements of ASME A17.1 - 2010, NFPA 70, State, Parish and City Codes and with the ADAAG (Americans with Disabilities Act Architectural Guidelines).
- B. Include all elevator items customarily provided by the Elevator Manufacturer which is necessary for the completion of work whether or not they are shown in the documents, but are inferable as being necessary to provide the intended results.

1.3 RELATED SECTIONS

A. Section 015000 – Temporary Facilities and Controls: Protection of floor openings and personnel barriers; temporary power and lighting.

B. Section 033000 – Cast-in-Place Concrete: Elevator pits.

C. Section 036000 – Grouts (Grouting): Grouting door frames and sills.

D. Section 042000 – Masonry Units (Unit Masonry): Setting sleeves, inserts, and anchoring devices in masonry for guide-rail brackets.

E. Section 051200 – Metal Stairs Structural Steel (Structural Steel Framing): Support steel, divider beams, and hoist beams.

F. Section 055000 – Gypsum Metal Fabrications: Pit ladders, supports for entrances in drywall hoistways.

G. Section 061053 – Miscellaneous Rough Carpentry: Temporary platform assembly.

H. Section 071600 – Cementitious Waterproofing: Waterproofing of elevator pit.

I. Section 092900 – Gypsum Board: Hoistway walls with variations not to exceed 1/2" at any point

J. Section 099000 – Paints and Coatings (Painting and Coating): Field painting of elevator entrances over primer.

K. Section 283100 – Detection and Alarm (Fire Detection and Alarm): Heat, smoke, and products of combustion sensing devices, fire alarm signal lines to contacts in machine space.

L. Section 23000 – Heating, Ventilating, and Air Conditioning Equipment (Heating, Ventilating, and Air-Conditioning (HVAC)): Heating, cooling, and ventilation of control and machinery space.

M. Section 260500 – Wiring Methods (Common Work Results for Electrical): Light outlets, convenience outlets, light switches, and conduits.

N. Section 262400 – Switchboards, Panelboards, and Control Centers (Switchboards and Panelboards): Disconnect switches.

O. Section 265000 – Lighting: Light fixtures.

P. Section 221429 – Sump Pumps: For sump pumps, sumps, and sump covers in elevator pits.

Q. Section 271500 – Communications Horizontal Cabling: For Telephone service for elevators and for Internet connection to elevator controllers for remote monitoring.

R. Section 273000 – Telephone and Intercommunication Equipment (Voice Communications): Telephone outlets and elevator telephones.

S. Section 31000 – Earthwork: Excavation of elevator pit.

1.4 REFERENCES

A. ANSI/ASME A17.1/CAN/CSA B44 – Safety Code for Elevators and Escalators.

B. ADAAG – Americans with Disabilities Act Accessibility Guidelines.

C. ANSI/NFPA 70 – National Electrical Code.

D. ANSI/NFPA 80 – Fire Doors and Windows.

E. ANSI/UL 10B – Fire Tests of Door Assemblies.

F. CAN/CSA C22.1 – Canadian Electrical Code.

G. Model and Local Building CodesH. ISO 9001: 2000 - Quality Management Systems - Requirements.

1.5 DESIGN REQUIREMENTS

A. Arrange elevator components in control closet or machinery space so equipment can be removed for repairs or replaced with minimal disturbance to other equipment and components.

B. Where permitted by code, provide all elevator equipment including controls, drives, transformers, and rescue features within the elevator hoistway.

1.6 SUBMITTALS

A. Comply with Section 013300 (01 33 00) – Submittal Procedures.

B. Product Data: Submit manufacturer/installer's product data, including,

a. Descriptive brochures or detail drawings of car and hall fixtures, cab ceilings, and product features.

b. Power Information: Horsepower, starting current, running current, machine and control heat release, and electrical requirements.

C. Shop Drawings: Submit manufacturer/installer's shop drawings, including plans, elevations, sections, and details, indicating location of equipment, loads, dimensions, tolerances, materials, components, fabrication, fasteners, hardware, finish, options, accessories, and other information to render totally functional elevators.

D. Samples: Submit manufacturer/installer's samples of standard colors and finishes of finish materials.

E. Operation and Maintenance Manual: Submit manufacturer/installer's operation and maintenance manual; including operation, maintenance, adjustment, and cleaning instructions; trouble shooting guide; renewal parts catalogs; and electrical wiring diagrams.

F. Warranty: Submit manufacturer/installer's standard warranty.

1.7 QUALITY ASSURANCE

A. Manufacturer/Installer's Qualifications: Specialize in manufacturing and installing elevator equipment, with a minimum of 10 years successful experience.

B. Regulatory Requirements:

a. Elevator design, clearances, construction, workmanship, materials, and installation, unless specified otherwise, shall be in accordance with ANSI/ASME A17.1, handicap accessibility, Americans with Disabilities Act, and other codes having legal jurisdiction.

b. ANSI/ASME A17.1 shall govern, except where codes having legal jurisdiction include more rigid requirements or conflict with ANSI/ASME A17.1.

c. Elevator shall follow design and manufacturing procedures certified in accordance with ISO 9001-2000 to meet product and service requirements for quality assurance for new products.

d. Where product is in variance to the published ANSI/ASME A17.1 model code, provide a 3rd party AECO certification demonstrating equivalent function, safety, and performance.

C. Pre-installation Meeting:

a. Convene pre-installation meeting before start of installation of elevators.

b. Require attendance of parties directly affecting work of this section, including Contractor, Architect, and elevator manufacturer/installer.

c. Review examination, installation, field quality control, adjusting, cleaning, protection, and coordination with other work.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to site in manufacturer/installer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer/installer.

B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer/installer's instructions.

C. Handling: Protect materials during handling and installation to prevent damage.

1.9 PROJECT CONDITIONS

A. Temporary Electrical Power:

a. Owner will arrange for temporary 220 VAC, single-phase, 60 Hz., GFCI-protected electricity to be available for installation of elevator components.

b. Comply with Section 015100 – Temporary Utilities.

B. Installation of the Elevator:

a. General Contractor will provide permanent three-phase power prior to installation start.

b. General Contractor will provide clear, rollable access to a 20' x 10' secure and dry storage area prior to delivery.

c. General Contractor will provide a clean, dry, and complete hoistway along with temporary installation platform and all required OSHA-compliant barricades prior to delivery.

C. Temporary Use of Elevator: (**Not Allowed during Construction without Owner's written consent**)

a. Owner may negotiate with manufacturer/installer for temporary use of elevator, if required.

b. Temporary use of elevator shall be in accordance with terms and conditions of manufacturer/installer's temporary acceptance form.

1.10 SCHEDULING

A. Coordinate elevator work with work of other trades, for proper time and sequence to avoid construction delays.

1.11 WARRANTY

A. Manufacturer/installer shall guarantee materials and workmanship of equipment installed under these specifications and make good, defects not due to ordinary wear or to improper use, which may develop within 1 year after completion of installation or acceptance thereof by beneficial use, whichever is earlier.

1.12 MAINTENANCE SERVICE

A. Elevator maintenance service shall be performed by elevator manufacturer/installer.

B. Elevators shall receive regular maintenance on each unit for period of 12 months after completion of work specified herein or acceptance thereof by beneficial use, whichever is earlier.

C. Trained employees shall make periodic examinations and perform work including necessary adjusting, greasing, oiling, and replacing parts to keep elevators in operation, except parts that require replacement because of accidents, vandalism, misuse, or negligence by parties other than manufacturer/installer.

D. Manufacturer/installer shall perform all Work, except emergency minor adjustment call-back service, during regular working hours. Manufacturer/installer shall provide emergency minor adjustment call-back service, during regular working hours.

E. Should Owner request that examinations, cleaning, lubrication, adjustments, repairs, replacements, or emergency minor adjustment call-back service, unless specified herein, be performed on other than manufacturer/installer's regular working hours of regular working days, manufacturer/installer shall absorb straight-time labor charges and Owner will compensate manufacturer/installer for overtime premium, travel time, and expense at normal billing rates.

F. Elevator Control System:

a. Include built-in remote diagnostic module to relay constant status of elevators and control system to a 24-hour, 7-days-a-week central-monitoring facility.

b. Remote Monitoring Device: Transmit information on current status of elevators, including malfunctions, system errors, and shutdown.

G. Maintenance Options

Regular Maintenance: During Regular Working Hours

Callback Service: During Regular Working Hours

Maintenance Period: 12

PART 2 – PRODUCTS

2.1 MANUFACTURER/INSTALLER

- A. Schindler Elevator Corporation, Website www.us.schindler.com.
- B. Equals per Section 01 25 00

2.2 ELEVATOR SYSTEM AND COMPONENTS

A. Electric Traction Passenger Elevators: Basis of design is the Schindler 3100 Gearless Traction Elevator.

B. Elevator Equipment Summary:

- a. Application: Machine Room Less (MRL)
- b. Counterweight Location: Side
- c. Machine Location: Top of the hoistway mounted on car and counterweight guide rails
- d. Control Space Location: Top landing entrance frame or entrance frame at one floor below the top landing
- e. Service: General Purpose Passenger
- f. Quantity: 1 Unit
- g. Capacity: 2100 lbs
- h. Speed: 100 fpm
- i. Travel: 11' 5"
- j. Landings: 2
- k. Front Openings: 2
- l. Rear Openings: 0
- m. Rear Door Hand: N/A
- n. Operation: Microprocessor Single Car Automatic Operation
- p. Clear Inside Dimensions: 5' 9-5/16" Wide X 4' 4-7/8" Deep
- q. Cab Height: 7' 9"
- r. Guide Rails: Equivalent to 12 lb. per foot
- s. Entrance Type and Width: Two Speed Side Opening 3' 0" Wide X 7' 0" High doors

t. Entrance Height: 7'-0"

u. Power Supply: 208 Volts 3 Phase 60 Hz

C. Performance:

a. Car Speed: -10% to +5% of contract speed under any loading condition or direction of travel.

b. Car Capacity: Safely lower, stop and hold up to 125% of rated load per code.

D. Ride Quality:

a. Vertical Vibration (maximum): 25 mg

b. Horizontal Vibration (maximum): 15 mg

c. Vertical Jerk (maximum): 2 ft/sec³

d. Acceleration (maximum): 1.6 ft/sec²

e. In Car Noise: 53-60 dB(A)

f. Stopping Accuracy: ±5mm

g. Starts per hour (maximum): 180

E. Elevator Operation:

a. Simplex Collective Operation: Using a microprocessor based controller, operation shall be automatic by means of the car and hall buttons. When all calls have been answered, the car shall park at the last landing served.

b. Group Automatic Operation with Demand-Based Dispatching: Provide reprogrammable group automatic system that assigns cars to hall calls based on a dispatching algorithm designed to minimize passenger waiting time.

F. Operating Features - Standard:

a. Door Light Curtain Protection

b. Static AC Drive

c. Phase Monitor Relay

d. Cab Overload with Indicator

e. Load-weighing

f. Central Alarm

g. Remote Monitoring

h. Firefighter's Operation

i. Automatic Evacuation

I. When the main line power is lost for longer than 5 seconds the **emergency battery power supply** provides power automatically to the elevator controller. If the car is at a floor when the power fails, it remains at that floor, opens its doors, and shuts down. If the car is between floors, it is raised or lowered to the first available landing, opens its doors, and shuts down.

j. Independent Service

G. Operating Features – Access Control for 1st floor.

2.3 EQUIPMENT: CONTROL COMPONENTS AND CONTROL SPACE

A. Controller: Provide microprocessor based control system to perform all of the functions of safe elevator operation, as well as perform car and group operational control.

a. All high voltage (110v or above) contact points inside the inspection and test panel shall be protected from accidental contact in a situation where the access panels are open.

b. The controller shall be distributed throughout the elevator system located in the overhead, cab and inspection and test panel. The inverter will be mounted in the overhead adjacent to the hoist machine and an inspection and test panel will be located in the door jamb at the top floor or one floor below the top floor. No elevator equipment mechanical rooms or closets are required.

c. Provide multi-bus control architecture to reduce cabling, material and waste.

B. Drive: Provide a Variable Voltage Variable Frequency AC Closed Loop drive system. Provide stable start without high peak current, quickly reaching a low energy consumption level.

C. Inspection and Test Panel: Integrated control equipment, main inspection and test panel in door frame at top level served or at one floor below the top level served.

2.4 EQUIPMENT: HOISTWAY COMPONENTS

A. Machine:

a. Gearless asynchronous AC motor with integral drive sheave, service and emergency brakes.

b. Design machine to enable direct power transfer, thereby avoiding loss of power.

c. Design machine to be compact, lightweight and durable to optimize material usage and save space.

d. Mount to structural support channels on top of guide rail system as applicable in hoistway overhead.

B. Governor:

a. Tension type over-speed governor with remote manual reset.

b. Mount to structural support channels as applicable in hoistway overhead.

C. Buffers, Car and Counterweight: Compression spring type buffers to meet code.

D. Hoistway Operating Devices:

- a. Emergency Stop switch in the pit.
- b. Terminal stopping switches.
- c. Emergency stop switch on the machine.

E. Positioning System: System consisting of proximity sensors and door zone vanes.

F. Guide Rails and Attachments: Provide Tee-section steel rails with brackets and fasteners. Side counterweight arrangements shall have a dual purpose bracket that combines both counterweight guide rails, and one of the car guide rails to building fastening.

G. Suspension System: Non circular Elastomeric coated suspension media with high tensile grade steel cords.

H. Governor rope: Steel wire rope with 6 mm diameter.

2.5 EQUIPMENT: HOISTWAY ENTRANCES

A. Hoistway Doors and Frames:

- a. UL rated with required fire rating.
- b. Doors: Rigid flush panel construction with reinforcement ribs.
- c. Frames: Securely fasten at corners to form unit frame. Frames shall be bolted.

B. Finish:

b. Exposed Areas of Corridor Frames: Stainless Steel - All Floors

c. Exposed Areas of Corridor Frames:

I. 1st Floor: Painted Primer

II. 2nd Floor: Painted Primer

III. Typical Floors: Painted Primer

d. Doors: Painted Color - All Floors

e. Doors: Painted Color - All Floors

f. Doors:

I. 1st Floor: Painted Primer

II. 2nd Floor: Painted Primer

III. Typical Floor: Painted Primer

g. Sills: Aluminum - All Floors

h. Sills: Aluminum - All Floors

C. Entrance Markings and Jamb Plates: Provide standard entrance jamb tactile markings on both jambs, at all floors. Plate Mounting: Refer to manufacturer drawings.

2.6 EQUIPMENT: CAR COMPONENTS

A. Car Frame and Safety: Provide car frame with adequate bracing to support the platform and car enclosure. The safety shall be integral to the car frame and shall be flexible guide clamp type.

B. Platform: Provide platform of steel construction with plywood subfloor and aluminum threshold.

C. Car Guides: Provide sliding guide shoes mounted to top and bottom of both car and counterweight frame. Arrange each guide shoe assembly to maintain constant contact on the rail surfaces. Provide retainers in areas with Seismic design requirements.

D. Provide central guiding system to reduce mechanical friction and energy consumption.

E. Steel Cab:

a. Fire rating: Provide Class B fire rating for cab, or Class A fire rating where required by local Code.

b. Design cab to comply with LEED Indoor Environmental Quality requirements through use of Low-Emitting Materials on walls, ceiling and subflooring.

c. Car wall finish: Steel Plastic Laminate Finish selected from manufacturer's standard selections.

d. Base and frieze: Aluminum.

e. Car front finish: Brushed stainless steel.

f. Car door finish: Brushed stainless steel.

g. Ceiling: Canopy ceiling, finished in #4 Stainless Steel With Down Lit Led Lighting. Provide lighting consisting of four LED lights located in two semi-oval lateral cutouts located on the center-sides of the cab ceiling, Lexan lens cover.

h. Handrail: Round Bushed Stainless Steel - Return End. Locate on Rear & Side Walls.

i. Flooring: By others. Not to exceed 3/8" finished depth.

j. Ventilation: Provide one-speed fan in canopy.

k. Emergency Car Lighting: Provide an emergency power unit employing a 12 volt sealed rechargeable battery and static circuits to illuminate the elevator car and provide current to the alarm bell in the event of building power failure.

l. Emergency Siren: Provide siren mounted on top of the car that is activated when the Alarm button in the car operating panel is engaged.

m. Emergency Exit Switch: Provide an electrical contact to open the safety circuit when the emergency car top exit is opened. When the exit door is opened, the top exit switch shall signal the control and the car will be unable to move.

n. Emergency Exit Lock: Provide an emergency exit lock where required by local code.

o. Emergency Exit Guard: Provide emergency exit guard on top of car when required for hoistway wall to platform clearance exceeds 12" or for multiple cars in hoistway.

2.7 DOOR OPERATOR AND REOPENING DEVICES

A. Door Operator: Provide a closed loop VVVF high performance door operator with frequency controlled drive for fast and reliable operation to open and close the car and hoistway doors simultaneously.

B. In case of interruption or failure of electric power, the doors can be readily opened by hand from within the car, in accordance with applicable code. Provide emergency devices and keys for opening doors from the landing as required by local code.

C. Doors shall open automatically when the car has arrived at or is leveling at the respective landings. Doors shall close after a predetermined time interval or immediately upon pressing of a car button. Provide door open button in the car operating panel. Momentary pressing of this button shall reopen the doors and reset the time interval.

D. Provide door hangers and tracks for each car and hoistway door. Contour tracks to match the hanger sheaves. Design hangers for power operation with provisions for vertical and lateral adjustment. Hanger sheaves shall have polyurethane tires and pre-lubricated sealed for life bearings.

E. Electronic Door Safety Device: Equip car doors with concealed transmitter and receiver infrared beam devices to detect presence of object in process of passing through hoistway entrance and car doorway (light curtain device).

a. Use multi-beam scanning without moving parts to detect obstructions in door opening.

b. Detector Device: Prevent doors from closing, or if they have already started closing, cause doors to reopen and remain open while object is within detection zone.

c. Horizontal Beams: Minimum of 33 infra red beams to fill doorway from ground level to a height of 6 feet.

2.8 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

A. Car Operating Panel: Provide a car operating panel with all push buttons, key switches and message indicators for elevator operation.

a. Full height car operating panel shall be surface-mounted on front return.

b. Comply with handicap requirements.

c. Push Buttons: Mechanical, illuminating using long-lasting LEDs for each floor served.

d. Emergency Buttons: Provide in accordance with code. Emergency alarm button, door open and door close buttons.

B. Features of the Car Operating Panel Shall Include:

- a. Audible chime to signal that the car is either stopping at or passing a floor served by the elevator.
- b. Raised markings and Braille provided to the left hand side of each push button.
- c. Car Lantern: Provide LED illuminated car lantern with direction arrows to comply with local code when hall lanterns are not provided.
- d. Door open and close push buttons.
- e. Firefighter's hat and Phase 2 Key-switch
- f. Inspection key-switch.
- g. Key-switch for optional Independent Service Operation
- h. Illuminated alarm button with raised marking.
- i. Elevator Data Plate marked with elevator capacity and car number.
- j. Help Button: Activation of help button will initiate two-way communication between car and a location inside the building, switching over to alternate location if call is unanswered, where personnel are available to take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.

C. Hall Fixtures: Provide hall fixtures with necessary push buttons and key switches for elevator operation.

- a. Push buttons: Metallic tactile push buttons, up button and down button at intermediate floors, single button at each terminal floor.
- b. Height: Comply with handicap requirements.
- c. Illumination: Illuminating using long-lasting low power LEDs.

D. Hall Lanterns and Position Indicators.

- a. LED illuminated direction arrows with audible and visible call acknowledgement.

E. Hoistway access switches: Provide key-switch at top and/or bottom floor in entrance jamb as required by local code.

F. Firefighter's Phase 1 Service: Key switch in brushed stainless steel cover plate.

G. Fixture Cover Plates: For push buttons, hall lanterns and position indicators, resistant white back-printed glass, no screws required for mounting. Provide stainless steel cover plates for Firefighter's Phase I switch and hoistway access switches, with tamper resistant screws in same finish.

H. Mounting: Mount hall fixtures in entrance frames.

I. Access Control: Provide access control equipment and wiring adjacent to 1st floor elevator. Coordinate with other Access Control Vendor.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine hoistways, hoistway openings, and pits before starting elevator installation.

B. Verify hoistway, pit, overhead, and openings are of correct size, within tolerances, and are ready for work of this section.

C. Verify walls are plumb where openings occur and ready for entrance sill installation. Traditional sill angle or concrete sill support shall not be required.

D. Verify hoistway is clear and plumb, with variations not to exceed -0 to +1 inch at any point. Verify projections greater than 4" must be beveled not less than 75 degrees from horizontal. No negative tolerance is permitted for minimum hoistway dimensions.

E. Verify minimum 2-hour fire-resistance rating of hatch walls.

F. Notify Architect in writing of dimensional discrepancies or other conditions detrimental to proper installation or performance of elevators.

G. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to manufacturer/installer.

3.2 INSTALLATION

A. Install elevators in accordance with manufacturer/installer's instructions and ANSI/ASME A17.1.

B. Set entrances in vertical alignment with car openings, and aligned with plumb hoistway lines.

3.3 FIELD QUALITY CONTROL

A. Perform tests of elevator as required by ANSI/ASME A17.1 and governing codes.

3.4 ADJUSTING

A. Adjust elevators for proper operation in accordance with manufacturer/installer's instructions.

B. Adjust elevators for smooth acceleration and deceleration of car so not to cause passenger discomfort.

C. Adjust doors to prevent opening of doors at landing on corridor side, unless car is at rest at that landing, or is in leveling zone and stopping at that landing.

D. Adjust automatic floor leveling feature at each floor to within 1/4 inch of landing.

E. Repair minor damages to finish in accordance with manufacturer/installer's instructions and as approved by Architect.

F. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.5 CLEANING

A. Clean elevators promptly after installation in accordance with manufacturer/installer's instructions.

B. Do not use harsh cleaning materials or methods that could damage finish.

3.6 PROTECTION

A. Protect installed elevators from damage during construction in accordance with the negotiated temporary use agreement between Owner and manufacturer's installer.

END OF SECTION

DIVISION 21 - FIRE SUPPRESSION**SECTION 21 05 00 - COMMON WORK RESULTS FOR FIRE SUPPRESSION****PART 1 GENERAL****1.1 GENERAL**

The General Conditions, Supplementary Plumbing, Mechanical and Electrical Conditions, and Special Conditions are hereby made a part of this Division to the same extent as if written in full, and this Contractor shall observe all of the requirements thereof insofar as they pertain and apply to his work.

1.2 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 21 of these specifications.

1.3 SUMMARY

Section includes pipe, fittings, valves, and connections for sprinkler and/or combination sprinkler and standpipe systems.

1.4 CODES AND REFERENCES:

- A. All work shall be performed in full accord with the latest editions of the applicable state, and national building codes and local ordinances.
- B. Refer to each section for applicable codes and reference standards.

1.5 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.

1.6 REFERENCES

- A. American Society of Mechanical Engineers:
 - 1. ASME B16.1 through B16.25 – Various Piping types and fittings
 - 2. ASME B36.10M - Welded and Seamless Wrought Steel Pipe.
- B. ASTM International:
 - 1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. ASTM A135 - Standard Specification for Electric-Resistance-Welded Steel Pipe.
 - 3. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
 - 4. ASTM A795 - Standard Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use.
- C. American Welding Society:
 - 1. AWS A5.8 - Specification for Filler Metals for Brazing and Braze Welding.

- 2. AWS D1.1 - Structural Welding Code - Steel.
- D. American Water Works Association:
 - 1. AWWA C110 - American National Standard for Ductile-Iron and Grey-Iron Fittings, for Water and Other Liquids.
 - 2. AWWA C111 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - 3. AWWA C151 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
- E. National Fire Protection Association:
 - 1. NFPA 13 - Installation of Sprinkler Systems.
 - 2. NFPA 24 - Private Fire Service Mains.
 - 3. NFPA 45 – Standard on Fire Protection for Laboratories Using Chemicals
 - 4. NFPA 101 - Life Safety Code

1.7 CODE REQUIREMENTS

All aspects of design, installation and equipment shall conform in all respects to the rules, regulations and requirements of the State Fire Marshal, Property Insurance Association of Louisiana, City of Natchitoches and Local Fire Prevention Bureau. All piping, valves, fittings, etc. shall be U.L. listed and F.M. approved for fire protection service.

1.8 QUALITY ASSURANCE

- A. Perform Work in accordance with NFPA 13 and the requirements of the Louisiana State Fire Marshal.
- B. Maintain one copy of each document on site.

1.9 WARRANTY:

This contractor shall warrant all workmanship, material, equipment systems, etc., provided by him for a period of one year after substantial completion of each phase 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 of each phase. This warranty is in addition to any other guarantees or warranties and is not intended to limit such other guarantees or warranties.

1.10 DEFINITIONS: The following words and phrases as used herein 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; and in a workmanlike manner as defined by good local practice.
- 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. Submittals for approval are required where indicated.

- D. "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.
- 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 authority over interpretation of the "intent" shall rest with the Architect.
- F. "shall": Indicates a mandatory requirement.

1.11 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 shall 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.
- B. All proposals shall take these existing conditions and any revisions required into consideration.

1.12 CONSTRUCTION REQUIREMENTS:

- A. 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.
- B. 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.
- C. 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.
- D. 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 piping 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.

- E. All pipe 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 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.
- F. 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. All concealed lines shall be installed as required by the pace of the job to precede the general construction.
- G. 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.

1.13 SLEEVES AND PENETRATIONS:

- A. Refer to AIA General Conditions.
- B. 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.
- C. Above grade and dry location sleeves shall be constructed from 20 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.
- D. 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.
- E. 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. Fire stop shall be equal to BIO Fireshield, Inc., BIOTHERM 200 or BIO K-2 mortar as applicable. Penetrations shall meet or exceed the requirements set forth in the U.L. Fire Resistance Directory, Volumes I and II.

- F. 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.

1.14 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 insure construction safety. Refer to General Conditions and Supplementary General Conditions for additional information.

1.15 DAMAGE:

- A. 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.
- B. This Contractor shall repair, at no expense to the Owner, any such damage.
- C. 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.

1.16 FLOOR, CEILING AND WALL PLATES:

- A. Refer to AIA General Conditions.
- B. 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.

1.17 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.

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.

2.6 VALVES

- A. Valves shall be U.L. listed and F.M. approved for fire protection piping systems and shall be installed as required by the NFPA.
- B. Gate Valves:
 - 1. Up to and including 2 inches: Bronze body and trim, rising stem, hand wheel, solid wedge or disc, threaded ends.
 - 2. Over 2 inches : Iron body, bronze trim, rising stem pre-grooved for mounting tamper switch, hand wheel, OS&Y, solid bronze or cast iron wedge, grooved ends.
 - 3. Over 4 inches: Iron body, bronze trim, non-rising stem with bolted bonnet, solid bronze wedge, flanged ends, iron body indicator post assembly.
- C. Globe or Angle Valves:
 - 1. Up to and including 2 inches : Bronze body, bronze trim, rising stem and hand wheel, inside screw, renewable rubber disc, threaded ends, with back seating capacity.
 - 2. Over 2 inches: Iron body, bronze trim, rising stem, hand wheel, OS&Y, plug-type disc, flanged ends, renewable seat and disc.

- D. Ball Valves:
1. Up to and including 2 inches : Bronze two piece body, brass, chrome plated bronze, or stainless steel ball, teflon seats and stuffing box ring, lever handle and balancing stops, threaded ends.
 2. Over 2 inches: Manufacturers: Cast steel body, chrome plated steel ball, teflon seat and stuffing box seals, lever handle flanged.
- E. Check Valves:
1. Up to and including 2 inches: Bronze body and swing disc, rubber seat, threaded ends.
 2. Over 2 inches: Iron body, bronze trim, swing check with rubber disc, renewable disc and seat, flanged ends.
 3. 4 inches and over: Iron body, bronze disc with stainless steel spring, resilient seal, threaded, wafer, or flanged ends.
- F. Drain Valves:
1. Compression Stop: Bronze with hose thread nipple and cap.
 2. Ball Valve: Brass with cap and chain, 3/4 inch hose thread.

2.7 UNDERGROUND PIPING

Shall be Class 150 cast iron pipe, with mechanical joints, tar coated and UL approved. Fittings for this pipe shall be mechanical joint type, Class 250, tar coated. Underground piping shall be braced and clamped in an approved manner acceptable to the Rating Bureau. AWWA C-900 DR18 PVC as manufactured by North American Corp. may be used if permitted by local codes and authorities. Provide concrete thrust blocks at each change in direction and at all tees, plugs, caps, and bends in strict accordance with NFPA 24 and Appendix B.

2.8 ABOVE GROUND PIPING

General: Black steel pipe produced to the following: ASTM A-795, A-53 and A-135. Pipe, fittings and joints shall be UL listed and FM approved. Listed restrictions and installation procedures per NFPA-13, and state and local codes must be followed. Piping layout shall be such as to avoid, wherever possible, conflicts or interference with building lighting, multiple pipe runs and mechanical equipment, including piping and equipment not in this contract. Locations of these items will be shown or called for on the drawings.

Threaded Pipe: Schedule 40 pipe 1" through 6" NPS and Schedule 30 pipe 8" NPS and larger may be threaded as approved by UL, FM, and NFPA 13.

Roll-Grooved Pipe: Schedule 10 pipe 1 1/4" through 12" NPS may be roll-grooved and joined with UL listed rubber-gasketed couplings as approved by UL, FM, and NFPA 13.

Other Fittings/Joints: Schedule 10, 30 or 40 pipe with welded outlets and joints are acceptable in accordance with UL, FM, and NFPA 13.

Piping for dry-type systems shall be schedule 40 galvanized steel.

2.9 PIPE HANGERS AND SUPPORTS

- A. Hangers and supports shall be installed as required and shall be ULO listed for use in a sprinkler system. Hangers and supports shall be spaced in accordance with requirements of the NFPA.
- B. Hangers for Pipe Sizes 1/2 to 1-1/2 inch: Carbon steel, adjustable swivel, split ring.

- C. Hangers for Pipe Sizes 2 inch and Over: Carbon steel, adjustable, clevis.
- D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- E. Wall Support for Pipe Sizes to 3 inches: Cast iron hook.
- F. Wall Support for Pipe Sizes 4 inches and Over: Welded steel bracket and wrought steel clamp.
- G. Vertical Support: Steel riser clamp.
- H. Floor Support: Cast iron adjustable pipe saddle, lock nut, nipple, floor flange, and concrete pier or steel support.
- I. Copper Pipe Support: Carbon steel ring, adjustable, copper plated.

2.10 BACKFLOW PREVENTERS: <S><OM>

2.5.1 Provide a lead-free backflow preventer with test cocks, drain elbow and OS&Y gate valves, line size as indicated, as detailed on plans. Preventer shall be designed to equal or exceed the requirements of A.S.S.E. Standard 1015, AWWA Standard C-510 and the performance requirements of U.S.C. Foundation for Cross Connection Control Standard for Backflow Preventers.

2.5.2 Valve body shall be ductile iron Grade 65-45-12 with fusion epoxy coating internal and external per AWWA C550-90. Check seat disc holder, and spring shall be stainless steel. Backflow preventer shall be UL classified and FM approved

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and foreign material, from inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

- A. Install piping in accordance with NFPA 13 for sprinkler systems.
- B. Install Work in accordance with the requirements of the Louisiana State Fire Marshal.
- C. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient. Install piping to conserve building space, to not interfere with use of space and other work. Group piping whenever practical at common elevations.
- D. Install pipe sleeve at piping penetrations through footings, partitions, walls, and floors. Seal pipe and sleeve penetrations to maintain fire resistance equivalent to fire separation.
- E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- F. Pipe Hangers and Supports:

1. Install in accordance with NFPA 13.
 2. Install hangers to with minimum 1/2 inch space between finished covering and adjacent work.
 3. Place hangers within 12 inches of each horizontal elbow.
 4. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
 5. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
 6. Where installing several pipes in parallel and at same elevation, provide multiple or trapeze hangers.
 7. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- G. Slope piping and arrange systems to drain at low points. Install eccentric reducers to maintain top of pipe level.
- H. Prepare pipe, fittings, supports, and accessories for finish painting. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- I. Do not penetrate building structural members unless indicated.
- J. Where more than one piping system material is specified, install compatible system components and joints. Install flanges, union, and couplings at locations requiring servicing.
- K. Die cut threaded joints with full cut standard taper pipe threads with red lead and linseed oil or other non-toxic joint compound applied to male threads only.
- L. Install valves with stems upright or horizontal, not inverted. Remove protective coatings.
- M. Install gate valves for shut-off or isolating service. Install drain valves at main shut-off valves, low points of piping and apparatus.
- N. Where inserts are omitted, drill through concrete slab from below and install through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.
- O. Prime and paint all exposed sprinkler piping, hangers, etc; red unless directed otherwise by architect/owner. Exposed piping shall be approved in writing prior to installation.

3.3 CLEANING

- A. Clean entire system after other construction is complete.

3.4 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.

3.5 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 directly on the ground. 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 loose dirt, construction debris, overspray, etc., to the satisfaction of the Architect. Repairs made necessary by damage shall be paid for by the Contractor.

3.6 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.

3.7 FOUNDATIONS:

- A. Concrete foundations required by mechanical equipment shall be constructed by this Contractor. See Concrete Work.
- B. 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.

3.8 CONFLICTS, INTERFERENCES AND COORDINATION BETWEEN TRADES:

- A. 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.
- B. 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:
 1. Building lines
 2. Structural members
 3. Soil and drain piping
 4. Vent piping
 5. Refrigerant piping
 6. Condensate piping

7. Supply ductwork
 8. Exhaust ductwork
 9. Domestic water
 10. Electrical conduit
 11. Natural gas piping
 12. Automatic fire sprinkler piping
 13. Compressed air piping
- C. 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.
- D. 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.
- E. In the event of conflict between codes, as interpreted by the authority having jurisdiction and the contract documents, the codes shall govern.
- F. In the event of conflict between manufacturer's installation instructions and the drawings, the manufacturer's installation instructions shall govern.
- G. 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.

3.9 CUTTING AND PATCHING:

- A. 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.
- B. This Contractor shall cut and patch all paving as required by the installation of buried piping, including utilities.

3.10 CONCRETE WORK:

This Contractor shall provide all forming, reinforcing and concrete as required for his scope of work. Work shall conform to applicable portion of Division 3 CONCRETE.

3.11 TRENCHING AND BACKFILL:

- A. 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.
- B. 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.
- C. 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 12" 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.
- D. All excavating and backfilling shall be done in a manner so as not to disturb adjacent structures.

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:

- A. 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 all debris caused by his portion of the work.
- B. 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 and other finished products shall be thoroughly cleaned and polished.

3.16 FINAL OBSERVATIONS:

- A. 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.

- B. 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 21 13 13: AUTOMATIC SPRINKLER FIRE PROTECTION**PART 1 - GENERAL****1.1 GENERAL:**

The General Conditions, Supplementary Plumbing and Electrical Conditions, and Special Conditions are hereby made a part of this Division to the same extent as if written in full, and this Contractor shall observe all of the requirements thereof insofar as they pertain and apply to his work.

1.2 SCOPE:

1.2.1 The scope of these specifications includes: the engineering, design and complete installation of the automatic fire sprinkler system. The Sprinkler Contractor shall furnish and install the entire sprinkler system, from the base of the riser to the final installation of each head. Where conditions arise such that the sprinkler system installation is exposed directly to the exterior or to unconditioned interior spaces which will not maintain a space temperature above forty degrees Fahrenheit (i.e. attics, shafts, etc.), provide a dry-type automatic sprinkler system in strict accordance with the requirements of NFPA. Any and all components as required for a complete installation of each system type shall be provided including, but not limited to, piping, fittings, air compressors with power supply (coordinate with electrical contractor), etc. These areas shall be clearly marked in the shop drawing submittal.

1.2.2 It shall be a specific requirement that insofar as possible, all sprinkler system mains and branches shall be installed as close as possible to the deck (top floor) or structural concrete slab (lower floor).

1.2.3 All piping for all systems shall be coordinated with lighting fixtures, air-conditioning ducts, piping and air handling units. Sprinkler heads shall be located in the center of the ceiling tiles each way. Final exact locations shall be verified with the Architect upon shop drawings submittal and immediately prior to installation.

1.2.4 Painting of all exposed sprinkler system piping, controls, valves, etc., shall be accomplished under the work this section. All sprinkler system piping throughout areas without finished ceilings shall be primed and painted; coordinate with the architectural reflected ceiling plans accordingly.

1.2.5 Caulking and sealing of sleeves for piping through floors and walls shall be included under the scope of the work of this section. The installation of all sleeves regardless of location, and the insulation of sprinkler system lines passing through insulated walls and partitions shall be in this Section of the work as specified hereinafter.

1.3 CODE REQUIREMENTS:

All aspects of design, installation and equipment shall conform in all respects to the rules, regulations and requirements of the State Fire Marshal, Property Insurance Association of Louisiana, City of Monroe, and Local Fire Prevention Bureau. All piping, valves, fittings, etc. shall be U.L. listed and F.M. approved for fire protection service.

1.4 SHOP DRAWINGS AND APPROVALS: <S>

The Automatic Sprinkler Subcontractor shall prepare complete shop drawings, hydraulic calculations, and dimensional working drawings for the entire installation. Subcontractor shall design for a minimum 10 PSI safety margin at the base of the riser in all hydraulic calculations. First submit to the Architect for approval the basic arrangement and layout. Such submittal will be noted for corrections or changes if required. Submit in four (4) copies. The corrected drawings shall then be submitted by the Subcontractor with review fees, completed applications, etc. to the Louisiana State Fire Marshal and Property Insurance Association of Louisiana.

Upon securing written approval of these agencies, submit to the Architect seven (7) copies of all drawings, stamped as approved, by each of the agencies.

PART 2 - PRODUCTS

2.1 MATERIALS AND INSTALLATION:

2.1.1 The materials and installation shall be as follows:

- A. Automatic Sprinkler Heads - Recessed, upright or pendent, of proper temperature rating, shall be installed throughout the areas as required by the insurance authority. Where furred or finished ceilings occur, the piping shall be installed above the ceiling with the sprinkler heads nipped to the ceiling and set in white polyester coated metal escutcheon plates. Sprinkler heads shall be recessed type with white polyester coated finish in all finished ceilings unless noted or specified otherwise.
- B. Sprinkler Riser - Shall be equipped with a riser check valve, drain valve, standard trimming and gauges.
- C. Electric Bells - Shall be furnished for alarm system and located as required.
- D. Drains - Shall be piped to outside of building as part of this work, except in locations where a drain fixture is provided by the plumbing design specifically.
- E. Piping System Valves - Shall be U.L. listed and F.M. approved for fire protection piping systems and shall be installed as required by the NFPA.
- F. Fire Department Connections

Wall connections shall be equal to Potter-Roemer 5025-D chrome-plated cast brass body with drop clappers, two way 2-1/2" X 2-1/2" X 4" back inlet, polished chrome-plated brass plate "automatic sprinkler standpipe", polished chrome-plated brass 2-1/2" double female snoots with rigid end N.P.T. X pin lug hose thread swivels, pin lug plugs and chains.

Pedestal connections shall be equal to Potter-Roemer 5763-C polished chrome-plated free-standing cast brass pedestal body, with drop clappers, two way 2 1/2" x 2 1/2" x 4" inlet, polished chrome-plated brass plate "automatic sprinkler standpipe", polished chrome-plated brass 2 1/2" double female snoots with rigid end N.P.T. x pin lug hose thread swivels, pin lug plugs and chains.

- G. Overhead Piping

General: Black steel pipe produced to the following: ASTM A-795, A-53 and A-135. Pipe, fittings and joints shall be UL listed and FM approved. Listed restrictions and installation procedures per NFPA-13, and state and local codes must be followed. Piping layout shall be such as to avoid, wherever possible, conflicts or interference with building lighting, multiple pipe runs and mechanical equipment, including piping and equipment not in this contract. Locations of these items will be shown or called for on the drawings.

Threaded Pipe: Schedule 40 pipe 1" through 6" NPS and Schedule 30 pipe 8" NPS and larger may be threaded as approved by UL, FM, and NFPA 13.

Roll-Grooved Pipe: Schedule 10 pipe 1 1/4" through 12" NPS may be roll-grooved and joined with UL listed rubber-gasketed couplings as approved by UL, FM, and NFPA 13.

Other Fittings/Joints: Schedule 10, 30 or 40 pipe with welded outlets and joints are acceptable in accordance with UL, FM, and NFPA 13.

Piping for dry-type systems shall be schedule 40 galvanized steel.

- H. Hangers - Shall be installed as required and shall be UL listed for use in a sprinkler system. Hangers shall be spaced in accordance with the requirements of the NFPA.
- I. Sprinkler Cabinet - One cabinet with 6 sprinkler heads and a head wrench shall be installed in the project where directed. Sprinklers shall be representative of those installed.
- J. Underground Piping - Shall be Class 150 cast iron pipe, with mechanical joints, tar coated and UL approved. Fittings for this pipe shall be mechanical joint type, Class 250, tar coated. Underground piping shall be braced and clamped in an approved manner acceptable to the Rating Bureau. AWWA C-900 DR18 PVC as manufactured by North American Corp. may be used if permitted by local codes and authorities. Provide concrete thrust blocks at each change in direction and at all tees, plugs, caps, and bends in strict accordance with NFPA 24 and Appendix B.
- K. Trenching and Backfill - Sprinkler lines included under this section shall conform to applicable portions of the specifications for excavation and backfill for buildings, including compaction and soils engineer control.

PART 3 - EXECUTION

3.1 TESTING:

3.1.1 All piping shall be tested for two hours at 200 psi in the presence of the Owner's representative and the inspector for the Rating Bureau and the Fire Marshal's representative and shall be proved tight. Unsatisfactory workmanship shall be corrected to the satisfaction of the above-mentioned persons. Defective materials shall be replaced with new materials and the defective materials removed from the premises.

3.1.2 After testing and inspection of the entire system, and prior to project occupancy, a completed "Contractor's Material and Test Certificate" per NFPA-13 shall be submitted by the contractor for review and approval by the State Fire Marshal.

3.2 GUARANTEE:

All materials and workmanship installed under this section of the specifications shall be guaranteed for a period of one year from the date of acceptance of the installation by the Owner. Any defects noted within this period shall be promptly repaired by the Contractor at no expense to the Owner. The Contractor shall also be responsible for any damage to other work caused by leaks or breaks in work installed under this Contract during the period of construction and the guarantee period.

END OF SECTION

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 15 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 REFERENCED STANDARDS:

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 plumbing 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 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 via U.S. Mail or hand delivery to the Architect in written hard copy form at least 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 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 shall 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 For renovation projects, or projects where additions are being made to any existing building(s) or campus, the contractor shall be *required* to visit the site to field verify existing conditions prior to submitting a proposal. Any cost associated with any conflicts and/or changes that arise during construction due to the contractor's failure to field verify existing conditions shall be the sole responsibility of the contractor and not the owner.

1.10.3 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 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. 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 plumbing 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 SLEEVES AND PENETRATIONS:

1.12.1 Refer to AIA General Conditions.

1.12.2 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.

1.12.3 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.

1.12.4 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.

1.12.5 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. Fire stop shall be equal to BIO Fireshield, Inc., BIOTHERM 200 or BIO K-2 mortar as applicable. Penetrations shall meet or exceed the requirements set forth in the U.L. Fire Resistance Directory, Volumes I and II.

1.12.6 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.

1.13 ISOLATION:

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.

1.14 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 insure construction safety. Refer to General Conditions and Supplementary General Conditions for additional information.

1.15 DAMAGE:

1.15.1 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.

1.15.2 This Contractor shall repair, at no expense to the Owner, any such damage.

1.15.3 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.

1.16 FLOOR, CEILING AND WALL PLATES:

1.16.1 Refer to AIA General Conditions.

1.16.2 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.

1.17 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. WH-1, HWC-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.

1.18 IDENTIFICATION:

1.18.1 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.

1.18.2 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.

1.18.3 Piping systems shall have designation on ten foot (10'-0") centers and closer where required to provide adequate identification, using Brady "all temperature permacode" pipe markers with direction of flow and service indication.

1.18.4 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. All marks shall be as manufactured by Brady or approved equal.

1.19 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.

1.20 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.

1.21 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.

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. 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 LARGE EQUIPMENT:

All large pieces of equipment which will be installed in the building, and which are too large to permit access through doorways, stairways or shafts, shall be brought to the job by the Contractor and placed in the spaces before the enclosing structure is closed in.

3.5 FOUNDATIONS:

3.5.1 Concrete foundations required by mechanical equipment shall be constructed by this Contractor. See Concrete Work.

3.5.2 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.

3.6 CONFLICTS, INTERFERENCES AND COORDINATION BETWEEN TRADES:

3.6.1 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.

3.6.2 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. Refrigerant Piping
- F. Condensate piping
- G. Supply ductwork
- H. Exhaust ductwork

- I. Return ductwork
- J. Domestic water
- K. Electrical conduit
- L. Natural gas piping
- M. Automatic fire sprinkler piping
- N. Compressed air piping

3.6.3 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.

3.6.4 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.

3.6.5 In the event of conflict between codes, as interpreted by the authority having jurisdiction and the contract documents, the codes shall govern.

3.6.6 In the event of conflict between manufacturer's installation instructions and the drawings, the manufacturer's installation instructions shall govern.

3.6.7 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.

3.7 CUTTING AND PATCHING:

3.7.1 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.

3.7.2 This Contractor shall cut and patch all paving as required by the installation of buried piping, including utilities.

3.8 PAINTING:

3.8.1 All painting except "touch-up", exposed piping throughout service shop and car wash areas, gas piping and equipment/mechanical room piping shall be provided under the painting sections 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.

3.9 CONCRETE WORK:

This Contractor shall provide all forming, reinforcing and concrete as indicated such as equipment bases, plumbing stack support pads, valve and cleanout pads and headwalls. Work shall conform to applicable portion of Division 3 CONCRETE.

3.10 TRENCHING AND BACKFILL:

3.10.1 All necessary excavation and backfill for the installation of plumbing, heating, air conditioning and ventilating 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.

3.10.2 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.

3.10.3 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.

3.10.4 All excavating and backfilling shall be done in a manner so as not to disturb adjacent structures and any shoring required shall be provided.

3.11 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.

3.12 ELECTRICAL WORK:

3.12.1 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 and control. This includes mounting of all electrical devices furnished under this section of these specifications.

3.12.2 Conduit and wiring (below 50 VAC) for all automatic controls, and interlock shall be provided by this 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.

3.12.3 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.

3.12.4 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.

3.13 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.

3.14 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.

3.15 EQUIPMENT AND AIR INTAKE ARRANGEMENTS:

3.15.1 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.

3.15.2 Outside air, ventilation and combustion air intakes shall be separated from exhaust air outlets, flues, plumbing vent stacks, etc. to avoid infiltration of odors, fumes and other contaminants. Separation shall be 15 ft. minimum.

3.16 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.

3.17 FLASHING AND WATERPROOFING:

All building penetrations to outside shall be flashed and counter flashed as required to eliminate leaks.

3.18 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, and as required by applicable codes and standards as a minimum.

3.19 CLEAN-UP:

3.19.1 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.

3.19.2 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.

3.20 FINAL OBSERVATIONS:

3.20.1 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.

3.20.2 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 03 - PLUMBING 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 REFERENCED STANDARDS:

National Bureau of Standards (NBS).
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).

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 exterior to the building 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, 1-1/2" and smaller in size, and 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-foe solder and wrought solder joint copper fittings. Pipe larger than 1 1/2" shall be Type-L hard copper per ASTM B-88 with silver-foe solder and wrought 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. <S> At contractor's option Victaulic grooved or Nibco "PressFit" copper systems may be used per manufacturer's recommendations for sizes 2" and larger.

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 <S>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 equal to Nibco's Nib-Seal extended handle. (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. Bronze components shall contain not more than 12% zinc.

- A. Gate valves throughout the domestic water piping shall be equal to Nibco S-111 or Milwaukee Gate 149, solder joint, 125 lb., rising stem, solid wedge disc.
- B. Check valves shall be equal to Nibco S-413-Y or Milwaukee Check 1509-S, 125 lb., bronze check valve with "Buna-N" disc.
- C. Temperature and pressure relief valves shall be ASME rated Watts valve or approved equal.
- D. Ball valves throughout the domestic water system shall be equal to Nibco S-585-70-66, solder joint, 600 psi WOG, stainless steel ball and trim, reinforced TFE seats, full-port, quarter-turn, two-piece.

2.1.7 On each cold supply where serving water closets or urinals, provide a manufactured water hammer 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. On all other hot and cold water supplies provide an air chamber the same size as the supply 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.

2.2 SANITARY DRAINAGE:

2.2.1 All sanitary drainage line (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-188-59, 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 Plumbing Inspector but shall be limited to above ground installation. Any drain line subject to contamination by oil, gasoline, or any other petroleum product shall have "BUNA-N" gaskets, approved for that service.

2.2.2 <S> At the Contractor's option, and where approved by local authority, sanitary drainage and vent piping underslab and sanitary vent piping above slab, may be type DWV Schedule 40 PVC pipe and fittings per ASTM D-2665-78. PVC piping shall not be permitted in return air plenums, or exposed interior and exterior to the building. All drainage piping above slab shall be service-weight cast iron pipe and fittings as previously specified. All vents through roof (VTRs) shall be service weight cast iron with a cast iron to PVC adaptor or transition fitting above ceiling as required.

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, eighth, 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 18" above roof and shall be flashed per roofing manufacturer requirements as follows:

1. 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.
2. 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.
 3. 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.

2.2.5 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.

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 primer valve with 1/2" cold water supply and ball shut-off valve where ProSet Trap Guard is not used. 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 STORM WATER PIPING:

2.3.1 All storm water piping within the building and above ground shall be cast iron pipe per ASTM A53, coated inside and out and shall be labeled with the C.I. mark of quality and permanence as illustrated in

Commercial Standard CS-188-59, 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" or approved lead and oakum joint. "No Hub" piping will be acceptable above slab if approved by Local Plumbing Inspector.

2.3.2 <S> At contractor's option, and where approved by local authority, Schedule 40 PVC DWV pipe and fittings per ASTM D-2665-78 may be used for storm water piping installed below slab. PVC piping shall not be permitted above slab, in return/exhaust plenums or exposed interior or exterior to the building.

2.3.3 Cleanouts shall be provided at each change in direction of the drain lines, at the end of each continuous line, and at 100'-0" intervals exterior to the building. The sizes of cleanouts shall be identical with the size of drain 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. 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.

2.4 DRAIN AND RELIEF PIPING:

2.4.1 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.

2.4.2 All drain piping shall be installed with a minimum fall of 1/8" per foot unless noted otherwise on plan.

2.5 GAS PIPING:

2.5.1 Furnish and install a system of 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.

2.5.2 All gas piping shall be standard weight black steel pipe per ASTM A-53. All intermediate pressure pipe and all pipe larger than 1-1/2" shall be welded joints. Low Pressure fittings 1-1/2" and smaller shall be standard weight black malleable iron screwed per ASTM A-197-65. Intermediate pressure fittings and fittings larger than 1-1/2" shall be "Tube-Turn" forged welding type, or approved equal. Screw thread joints shall be made with an approved compound & shall comply with ANSI Standard for Pipe Threads, B2.1-1968.

2.5.3 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 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.

2.5.4 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.

2.5.5 All equipment connections shall be preceded by a manual stop cock or full-port ball valve, union and 12" drip leg.

2.5.6 Gas cocks 2" and smaller shall be Crane Company No. 324, all iron with brass square head plug; cocks larger than 2" shall be Walworth, or equal, lubricated plug cocks, 150 psi wog. Gas ball valves shall be U.L. listed equal to Nibco K-590 with Teflon seat, 150 psi wog.

2.5.7 Unions 2-1/2" and smaller shall be Grinnell 463, or equal, black malleable iron, ground joint, brass to iron seat unions. Unions 3" and larger shall be Crane Company Standard malleable iron gasket type flange unions with proper gasket.

2.5.8 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.

2.5.9 Provide 17 pound 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.

2.5.10 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.

2.5.11 <S> Underground gas piping, if approved by local code, may be yellow polyethylene plastic pipe per API 15LE ASTM D-2513 with fusion joints equal to PPI PE 2406 in lieu of the wrapping black steel pipe.

2.5.12 Provide anodeless riser at building service entrances and at meter set for transition from polyethylene plastic pipe to above ground piping. Metal pipe shall have factory conforming to Republic "X-TRU-COAT".

2.5.13 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 or through the exterior wall with watertight flashing, gooseneck and birdscreen. Vents shall be the full size of the regulator vent connection and shall extend through the roof/wall undiminished in size.

2.5.14 Provide epoxy-coated flexible stainless steel braided connectors at all radiant heaters and unit heaters. Provide all required adaptors, reducers, etc. for equipment connections.

2.6 PIPING ACCESSORIES GENERAL:

2.6.1 Flanges shall be slip-on or butt welding standard weight 1/16" raised face type with gaskets.

2.6.2 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.

2.6.3 Weldolets and threadolets shall be steel per ANSI B16.9.

2.6.4 Escutcheons shall be single piece, set screw type, chrome plated and shall cover the opening and sleeve.

2.7 LABORATORY WASTE AND VENT SYSTEM: <S><OM>

2.7.1 General - Laboratory acid resistant waste and vent pipe (LW/LV), as shown on drawings, shall be Orion "Super Blue" or Zurn Z9A-PVDF40. Pipe and fittings to be Schedule 40 wall thickness. System shall include pipe supplied in 10 ft. lengths, and shall include fittings and traps. It shall also include recommended adaptors as required.

2.7.2 Material – Plenum rated pipe and fittings shall be flame retardant polyvinylidene fluoride (PVDF). Material shall be U.L. tested in accordance with ASTM E-84 and shall have a flame spread of 5 and a smoke density of 35. Non-plenum rated pipe and fittings shall be flame retardant polypropylene.

2.7.3 Joints - Connections for acid waste and vent pipe and fittings shall be made by means of mechanical coupling (at fixtures and equipment only), electrofusion, socket fusion, slip fit, butt fusion and socket-weld solvent; connections containing copper wire are prohibited. Connections between polypropylene and PVDF of piping material shall be made outside of the return air plenum by mechanical couplings only and with adapters according to manufacturer's recommendations. All connections to equipment, fixtures, etc. shall be made with mechanical couplings.

2.7.4 Installation - Installation shall be in accordance with contract drawings, the manufacturer's recommendations, and the local plumbing code. Entire system shall be installed free of stress and in proper alignment without strain. Horizontal supports shall be split ring or clevis type hanger spaced in accordance with manufacturer's recommendations. Vertical supports shall be standard riser clamps at each floor.

2.7.5 Tests - System shall be tested in accordance with the local plumbing code.

2.7.6 Acceptable Manufacturers: Orion, George Fisher, Spears, Zurn, Charlotte.

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 piping systems shall be installed level and the low points of all risers shall have gate 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, full-port 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 the 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, drains 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 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.

3.1.14 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.

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".

3.2 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 PVC Plastic pipe joints shall be assembled by applying NSF approved Oatey 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.

3.2.4 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.

3.2.5 See Paragraph 2.2 for cast-iron piping joints.

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 1-1/2"	6'-0"
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)
Up to 1-1/2"
2" and larger

SUPPORT SPACING

4'-0"
At the base and at each story level, not
exceeding 20'-0" levels

CAST IRON PIPING

NOMINAL PIPE SIZE
(MAXIMUM)
All pipe sizes

SUPPORT SPACING

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 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, Fee and Mason, Grinnell, F&S Manufacturing, 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 Closet	4"	3"	1"	—
Lavatories	1 1/2"	2"	1/2"	1/2"
Urinals (Wall Mtd)	2"	2"	3/4"	—
Sinks	1 1/2"	2"	1/2"	1/2"
Service Sinks	3"	2"	1/2"	1/2"
Floor Drains	4"	3"	—	—
Wall Faucets/Hose Bibbs	—	—	3/4"	—
Water Coolers	1 1/2"	1 1/2"	1/2"	—

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 furnished under this (general) contract that require natural gas, water, drain, waste or vent connections, furnishing all required shutoff cocks, valves, drain valves and traps unless specified or noted otherwise on plan.

3.5.3 All HVAC equipment requiring connection to the domestic water system shall be provided with a reduced pressure backflow preventer as specified in section 22 40 00.

3.5.4 System shall be capable of passing all Local Plumbing Code tests for conventional pipe and fittings.

3.6 GAS PIPING TESTING:

Gas piping shall be tested in strict accordance with NFPA 54.

3.7 TESTING REQUIREMENTS:

Refer to sections 22 09 00 for further testing requirements.

END OF SECTION

SECTION 22 07 00 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 GENERAL:

Refer to Section 15010 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 DOMESTIC WATER PIPING:

All cold water piping, hot water piping and hot water recirculating piping above grade shall be insulated with 1" thick, 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.

2.2 ALUMINUM METAL JACKET:

2.2.1 All insulation outside, exposed to weather shall be covered with 0.019" aluminum metal jacket (including refrigerant piping).

2.2.2 All insulation exposed in the service shop area shall be covered with a white PVC rigid jacket with sealed seams.

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 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 Refer to Section 22 05 00, for flame spread properties of insulating materials.

3.1.8 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.

3.1.9 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.

3.1.10 Armaflex insulation shall be slid on unslit or shall be applied with contact cement. Duct tape, electrical tape, staples, etc., shall not be permitted.

3.1.11 Rigid PVC and metal jackets shall have side and end lap at least 2-inches wide with the cut edge of the side lap turned inside one inch to provide a smooth edge. Overlap the jacket not less than 2 inches at longitudinal and circumferential joints, seal water-tight with silicone sealant, 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 all seams and joints with a coating recommended by the insulation manufacturer for weatherproofing.

3.1.12 Where pipe installation constraints (i.e. equipment connections, complex fittings, valves, etc.) hamper the addition of the metal jacketing, the Armaflex insulation may be exposed to the weather. At such locations, all Armaflex insulation exposed to the weather shall be coated with a weatherproof finish recommended by the manufacturer.

3.1.13 All Armaflex insulation exterior to the building shall be coated with a weatherproof finish recommended by the manufacturer.

END OF SECTION

SECTION 22 09 00 - CLEANING AND TESTING FOR PLUMBING SYSTEMS**PART 1 - GENERAL****1.1 GENERAL:**

Refer to Section 220500 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.

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.

3.1.2 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.

END OF SECTION

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:

City of Monroe Code and Ordinances
ADA Part II 36 CFR Part 1191 & Part III 28 CFR Part 36
Energy Policy Act of 1992, HR776
International Plumbing 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.).

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>

Reference plans for plumbing fixtures and equipment not listed below.

Acceptable Manufacturers:

Water Closets, Urinals, Lavatories - Kohler, American Standard, Zurn, Sloan.

Flush Valves - Sloan, Delany, Zurn, Delta Commercial.

Carriers - Jay R. Smith, Zurn, Josam, Wade, Mifab, Watts.

Mop Sinks – Acorn, Williams, Zurn.

Lavatory Accessories (excluding faucets and trim)- Kohler, American Standard, Zurn, McGuire, Dearborn, BrassCraft.

Faucets and Trim - Kohler, American Standard, Elkay, Zurn, Delta Commercial, T+S Brass.

Electric Water Coolers - Elkay, Halsey Taylor, Oasis, Haws, Acorn Aqua.

Tankless Water Heaters - Takagi, State, A.O. Smith, Rinnai.

Wall Faucets, Hose Bibbs - Woodford, Wade, Jay R. Smith, Josam, Zurn, Mifab.

Floor Drains, Floor Sinks, Cleanouts - Wade, Josam, Jay R. Smith, Zurn, Mifab, Watts.

Insulation Kits - Truebro, Plumberex.

Mixing Valve Assemblies – Symmons, Leonard, Lawler, Powers, Bradley, Acorn.

Backflow Preventers – Wilkins, Febco, Apollo, Watts.

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" drains.

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 bibbs and wall faucets: Woodford #34H or equal.

2.7.2 For water heaters without dip tubes: Watts #288A or equal.

2.8 DOMESTIC HOT WATER CIRCULATORS: <S><OM>

Hot water circulating pumps shall be manufactured by Belll 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 the 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.

3.2 PUMP INSTALLATION (including domestic hot water circulators):

- 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.
- D. Provide full-size unions or bolted flanges with gaskets on the suction and discharge side of each pump.

3.3 PUMP CONNECTIONS (including domestic hot water circulators):

- 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 non-slam swing check valve, full-port ball shut off valve, and glycerin-filled pressure gauge on the discharge side of pumps.
- D. Install a full-port ball shut off valve, strainer, butterfly balancing valve and glycerin-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.
- F. Install T & P test ports in suction and discharge piping around pump.

END OF SECTION

DIVISION 23 - HVAC**SECTION 23 05 00: COMMON WORK RESULTS FOR HVAC****PART 1 - GENERAL****1.1 SCOPE:**

The scope of the HVAC 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 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.

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 and utilities. 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 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 catalog 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. Submittal shall clearly identify the features, accessories, options, etc. of the specified equipment.
- C. Notwithstanding any reference in the specifications to any article, device, product, material, fixture, form, or type of construction by name, make or catalog 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 as determined by the architect 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 HVAC 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 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 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. Method of cleaning permanent type air filters.
- D. Location of concealed valves, traps, air splitters, automatic valves, and 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. Diagrams of automatic temperature 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 should be notified in writing.

1.10.2 For renovation projects, or projects where additions are being made to any existing building(s) or campus, the contractor shall be *required* to visit the site to field verify existing conditions prior to submitting a proposal. Any cost associated with any conflicts and/or changes that arise during construction due to the contractor's failure to field verify existing conditions shall be the sole responsibility of the contractor and not the owner.

1.10.3 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 the 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 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. AHU-1, EF-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.

1.16 IDENTIFICATION:

1.16.1 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.

1.16.2 Equipment, valves, and duct 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.

1.16.3 Piping systems shall have designation on ten foot (10'-0") centers and closer where required to provide adequate identification, using Brady "all temperature permacode" pipe markers with direction of flow and service indication.

1.16.4 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. All marks shall be as manufactured by Brady or approved equal.

1.16.5 Contractor shall obtain written approval of proposed identification scheme prior to application.

1.17 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.

1.18 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.

1.19 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.

1.20 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 air conditioning duct work, 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.

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 SLEEVES AND PENETRATIONS:

2.7.1 Refer to AIA General Conditions.

2.7.2 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.

2.7.3 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.

2.7.4 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.

2.7.5 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. Fire stop shall be equal to BIO Fireshield, Inc., BIOTHERM 200 or BIO K-2 mortar as applicable. 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.

2.7.6 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.

2.7.7 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.

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, duct work, 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, interior surfaces of duct work, exposed supports, ducts, 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 LARGE EQUIPMENT:

All large pieces of equipment which will be installed in the building, and which are too large to permit access through doorways, stairways or shafts, shall be brought to the job by the Contractor and placed in the spaces before the enclosing structure is closed in.

3.5 FOUNDATIONS:

3.5.1 Concrete foundations required by mechanical equipment shall be constructed by this Contractor. See Concrete Work.

3.5.2 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.

3.6 CONFLICTS, INTERFERENCES AND COORDINATION BETWEEN TRADES:

3.6.1 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.

3.6.2 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. Refrigerant piping
- F. Condensate piping
- G. Supply ductwork
- H. Exhaust ductwork
- I. Domestic water
- J. Electrical conduit

K. Natural gas piping

3.6.3 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.

3.6.4 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.

3.6.5 In the event of conflict between codes, as interpreted by the authority having jurisdiction and the contract documents, the codes shall govern.

3.6.6 In the event of conflict between manufacturer's installation instructions and the drawings, the manufacturer's installation instructions shall govern.

3.6.7 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.

3.7 CUTTING AND PATCHING:

3.7.1 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.

3.7.2 This Contractor shall cut and patch all paving as required by the installation of buried piping, including utilities.

3.8 CONCRETE WORK:

3.8.1 This Contractor shall provide all forming, reinforcing and concrete as indicated such as equipment bases, and valve pads. Work shall conform to applicable portion of Division 3 CONCRETE.

3.8.2 Reinforcing of concrete pads shall include minimum #4 bar 12" O.C. both ways unless noted otherwise on the plans.

3.9 PAINTING:

3.9.1 All painting except "touch-up", 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.

3.9.2 Where equipment finishes are damaged, this Contractor shall obtain matching color touch-up paint from the equipment's manufacturer and paint as required.

3.10 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 (Mechanical) 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 under this section (Mechanical) of these specifications. 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 mechanical contractor shall coordinate all 100 VAC and above requirements with the electrical 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 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.

3.12 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 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.

3.14 EQUIPMENT AND AIR INTAKE ARRANGEMENTS:

3.14.1 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.

3.14.2 Outside air, ventilation and combustion air intakes shall be separated from exhaust air outlets, flues, plumbing vent stacks, etc. to avoid infiltration of odors, fumes and other contaminants. Separation shall be 15 ft.

3.15 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.

3.16 FLASHING AND WATERPROOFING:

All building penetrations to outside shall be flashed and counter flashed as required to eliminate leaks.

3.17 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.

3.18 CLEAN-UP:

3.18.1 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.

3.18.2 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.

3.19 FINAL OBSERVATIONS:

3.19.1 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.

3.19.2 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.

3.20 DEMOLITION AND SALVAGE:

3.20.1 Where demolition of equipment or materials is required this Contractor shall minimize cutting and exercise all due caution to leave undamaged surfaces, material and equipment meant to remain. Where removal of any equipment, material, piping, conduit, etc. is required to gain access needed to perform the work, the contractor shall return such items to their original location and condition. Any items damaged during removal shall be replaced at no additional cost.

3.20.2 All existing items that are to be removed shall remain the property of the Owner unless declared as unsalvageable. Unsalvageable materials shall become the property of the Contractor and be removed from the site. Items declared as Owner's property shall be neatly stored on the site as directed by the Owner.

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 REFERENCED STANDARDS:

National Bureau of Standards (NBS).
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).

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 DRAIN AND RELIEF PIPING:

2.1.1 Condensate drain piping, auxiliary drain piping, equipment drains, and appliance drain piping shall be PVC. Provide pipe supports at specified intervals.

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 Condensate drain piping shall include threaded cleanout caps at changes in direction and at the upstream end of main lines. 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 1/4"

2.1.4 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-foe 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. 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.

2.2.2 Where site conditions of exact location of condensing units/heat pumps dictate that refrigeration piping be installed underground, all of the following conditions must be met:

- a. Piping shall be installed in Schedule 40 PVC sleeves, extending from the condensing unit/heat pump into accessible space, sealed water-tight at each end.
- b. Hot gas and suction piping shall be insulated with 2" thick Armstrong AP Armaflex.
- c. Hot gas piping shall be sloped back to the condensing unit/heat pump.
- d. Suction line accumulators shall be provided as directed by equipment manufacturer.
- e. Written authorization from equipment manufacturer shall be provided certifying that the proposed underground insulation will not void the system warranty, including compressor(s), prior to installation of piping.

If any of the above are not met, all underground piping shall be removed and replaced, at the contractor's expense, including any and all repairs/replacement of paving, walls, finishes, etc.

2.3 PIPING ACCESSORIES GENERAL:

2.3.1 Flanges shall be slip-on or butt welding standard weight 1/16" raised face type with gaskets.

2.3.2 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.

2.3.3 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 and shall be so spaced and installed as to maintain a rigid piping system, adequately supported both laterally and vertically.

3.1.2 At each piece of equipment, isolation valves shall be furnished and installed by this Contractor so that these 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.

3.1.3 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.

- 3.1.4 Necessary spring pieces and offsets shall be furnished by this Contractor as required.
- 3.1.5 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.
- 3.1.6 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.
- 3.1.7 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 the 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.
- 3.1.8 Pipe shall be cut accurately to measurements established at the site and worked into place without springing or forcing.
- 3.1.9 Provide clearance for installation of insulation and for access to valves, air vents, drain and unions.
- 3.1.10 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.
- 3.1.11 Locate and suspend piping in such a manner so as to minimize transmission of vibration and noise.
- 3.1.12 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.
- 3.1.13 All piping connections to equipment shall contain flanges or unions to allow easy removal whether or not shown on the plans.
- 3.1.14 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.
- 3.1.15 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:

- 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 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.
- 3.2.3 PVC Plastic pipe joints shall be assembled by applying NSF approved Oatey 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/supports for horizontal piping be greater than indicated on the following schedule:

COPPER PIPING/TUBING

NOMINAL PIPE SIZE (MAXIMUM)	SUPPORT SPACING
Up to 1-1/4"	6'-0"
1-1/2" and larger	8'-0"

PLASTIC (PVC) PIPING

NOMINAL PIPE SIZE (MAXIMUM)	SUPPORT SPACING
All pipe sizes	4'-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

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

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"
5" to 6"	3/4"
8" to 12"	7/8"

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 Fee and Mason, Grinnell, F&S Manufacturing, or prior-approved equal.

3.4 REFRIGERANT PIPING TESTS:

3.4.1 Piping system shall be tested for four (4) hours with 500 psig on high side and 500 psig on low side, using nitrogen and anhydrous carbon dioxide.

3.4.2 Refrigerant charge shall be provided as required after the piping system has been pressure tested and then drawn down to a vacuum of 50 microns for 12 hours. Halide torch test each joint after charging.

3.5 TESTING REQUIREMENTS:

Refer to section 23 05 90 for further testing requirements.

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.

3.1.2 Contractor shall record all air-flow values at both supply and return air (including temperatures) and shall make air-balance adjustments as required. Provide a mechanical plan with field verified air-flow values marked in red indelible pen in each space to the architect.

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 07 00: HVAC INSULATION**PART 1 - GENERAL****1.1 GENERAL:**

Refer to Section 23 05 00 for Common Work Results for HVAC.

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 supply, return and outside air ductwork except internally lined return air ductwork shall be insulated with 2" thick, three quarter pound per cubic foot minimum density glassfiber blanket insulation and have type FRK foil reinforced kraft vapor barrier jacket. Internally lined supply air ductwork shall be wrapped in addition to lined. 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. Refer to Section 23 30 00 for ductwork with internal lining.

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. Unightly 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 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 Refer to Section 23 05 00, for flame spread properties of insulating materials.

3.1.8 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.

3.1.9 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.

3.1.10 Armaflex insulation shall be slid on unslit or shall be applied with contact cement. Duct tape, electrical tape, staples, etc., shall not be permitted.

3.1.11 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.

3.1.12 All Armaflex insulation exterior to the building shall be coated with a weatherproof finish recommended by the manufacturer.

3.1.13 Exterior Applications: Provide insulation with vapor retarder jacket. Cover with caulked aluminum jacket with seams located on bottom side of horizontal duct section.

3.1.14 Inserts and Shields:

- A. Application: Refrigerant piping or equipment 1/2" diameter and larger, all other piping and equipment 1-1/4" diameter and larger.
- B. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
- C. Insert Location: Between support shield and piping and under finish jacket.
- D. Insert Configuration: Minimum 6" long, of thickness and contour matching adjoining insulation; may be factory fabrication.
- E. Insert Material: Compression resistant insulating material suitable for planned temperature range and service.

END OF SECTION

SECTION 23 09 10: 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 (100 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 100 VAC) shall be provided by the temperature controls contractor. The temperature controls contractor shall coordinate all 100 VAC and above requirements with the electrical contractor prior to bid.

PART 2 - PRODUCTS

2.1 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. Provide switching subbase: system-emergency heat/heat/off/cool/auto and fan - auto/on. Thermostat shall be capable of up to 7 different temperature settings per day, 7 days a week scheduling, manual override with manual adjustment up to 2 hours minimum and 10 hour battery back-up during power loss. Provide clear plastic-locking covers for thermostats.

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 the Temperature Control Subcontractor and shall be fully adjustable with a temperature range of 125°F to 200°F.

2.3 DUCT SMOKE DETECTORS: <S>

2.3.1 Provide in the return air ductwork and supply air ductwork of each recirculating air moving device over 2,000 CFM capacity, of nominal capacity capable of delivering 2000 cfm or more, and systems with a fan capacity less than 2000 CFM, but serving an area used for egress, a smoke detector with supervisory relays and remote test station to sound an alarm horn equal to Simplex #4901-9822, to initiate a visual alarm and stop the air moving device fan. Smoke detectors shall be equal to Simplex #4098-9687 housing with photoelectric detector, sampling tube extending full width of duct and #4098-9842 remote control station. Provide relays equal to Simplex 2088-9008 to initiate horn and strobe. (Reference International Mechanical Code, NFPA 90A.)

2.3.2 Remote test station and alarm horn shall be located in an occupied location. Coordinate with owner and architect. Provide laminated phenolic label engraved as follows:

"DUCT SMOKE ALARM"
["unit designation"]

2.3.3 Where conditions dictate that duct smoke detectors be installed exposed inside the facility or exterior to the facility exposed to environmental extremes, provide Simplex #4098-9845 weatherproof duct housing enclosure.

2.3.4 Where a complete new, fire alarm system, or modification of an existing fire alarm system is included in this contract, 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.

2.4 MISCELLANEOUS:

2.4.1 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.

2.4.2 Provide a time delay relay for each condensing unit/heat pump to stagger the start time for each unit such that no two units will start simultaneously.

2.5 CONDENSATE OVERFLOW SWITCH:

Provide condensate drain overflow switch for all units. Float switch shall stop the fan upon sensing water in auxiliary drain pan. Float switch shall be equal to Safe-T-Switch Model SS2.

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.

3.1.4 Temperature controls supplier shall provide a four (4) hour training session to acquaint the owner with control operation instructions and programming training. Provide Architect documentation, signed by Owner, that training session has been completed.

3.1.5 Supply and exhaust fans shall be interlocked as scheduled on the plans.

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.

3.3 INTERLOCKS:

3.3.1 All condensate drain overflow switches shall be interlocked to shutdown the respective unit.

3.3.2 All outside air intake dampers shall be interlocked with respective units to open when the unit compressor is enabled and close when disabled.

END OF SECTION

SECTION 23 30 00: SHEET METAL WORK AND ACCESSORIES**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. Ductwork shop drawings on all exposed ductwork shall be submitted to scale and coordinated with structural members, light fixtures, equipment, etc.

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 partitions, walls, or barriers 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 Pittsburgh 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 F296 or Flexmaster 5M, 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 10" w.g positive, 1" w.g. negative working pressure; 5500 fpm maximum velocity rating.
- 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 round as indicated on plans. Outer duct wall shall be paint-grip galvanized steel suitable for field painting unless noted otherwise.

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.

2.4.4 Spiral Seam Round Duct Joints: Gauges shall be in accordance with SMACNA Duct Construction Standard and fittings in accordance with SMACNA Duct Construction Standard, except as noted. Joints 0"-20" diameter, interior slip coupling beaded at center, fastened to duct with sealing compound applied continuously around joint diameter, use 3 piece, gasketed, flanged joints consisting of 2 internal flanges (with integral mastic sealant) split to accommodate minor differences in duct diameter, and one external closure band designed to compress gasketing between internal flanges. Example: Ductmate Spiralmate or equal.

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 and return 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" 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. All sidewall devices shall be coordinated with interior elevations and their mounting heights and finishes shall be approved by the architect prior to rough-in and installation.

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.

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 opposed, multi-blade as shown in the SMACNA manual as required and as detailed on plans. All dampers shall be rated for a minimum of 1500 FPM velocity. They shall have an indicating device with lock to hold damper in position for proper setting, an elevated manual quadrant; 2" min to accommodate external insulation, and synthetic bearings. Dampers installed above inaccessible ceiling shall be provided with concealed damper regulator and a miter gear. The Contractor shall provide an extension rod between the gear and the regulator.

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 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.

3.1.13 Leakage Testing of Installed System:

- A. The installed new duct systems shall be tested to the designed operating pressure.
- B. The air leakage at the test pressure shall be measured by a calibrated orifice type of flow meter. Total allowable leakage of the system shall not exceed the percentage of design cfm outlined above.
- C. 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.
- D. The testing shall be performed as follows:
 1. Perform testing in accordance with HVAC Air Duct Leakage Test Manual.
 2. Use a certified orifice tube for measuring the leakage.
 3. Define section of system to be tested and blank off.
 4. Determine the percentage of the system being tested.
 5. Using that percentage, determine the allowable leakage (cfm) for that section being tested.
 6. Pressurize to operating pressure and repair any significant or audible leaks.

7. Repressurize and measure leakage.
8. Repeat steps 6 and 7 until the leakage measured is less than the allowable defined in step 5.

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:

3.4.1 Provide 18 gauge galvanized sheet metal auxiliary drain pan under water heater. 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.

3.4.2 Provide 1" type "L" hard copper auxiliary drain piping from each drain pan and terminate through nearest exterior wall unless indicated otherwise on plan. Provide elbow and cover pipe opening with stainless steel insect screen.

END OF SECTION

SECTION 23 35 10: HVAC EQUIPMENT

PART 1 - GENERAL

1.1 GENERAL:

Refer to Section 23 05 00 for Common Work Results for HVAC.

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. condensing 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 removable 300 series stainless steel, shop fabricated guards painted to match the units shall be provided. Guards shall be subject to the Architect's approval.

1.5 EFFICIENCY:

Unless a higher efficiency is schedule on the plans, all equipment shall comply with the efficiency requirements of ASHRAE Standard 90.1 (latest edition) as a minimum. Efficiency requirements shall satisfy both the heating and cooling requirements where applicable.

1.6 REFERENCE 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 Residence Type Warm Air Heating & Air
Conditioning Systems - NFPA 90B
Standard for Installation of Air-Conditioning & Ventilating Systems - NFPA 90A

International Mechanical Code – ICC (latest edition)
 Reference SECTION 23 05 00 for additional information
 Louisiana Commercial Building Energy Conservation Code
 Energy Standard for Buildings Except Low-Rise Residential Buildings – ASHRAE Standard 90.1

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. Temporary filters for use during construction shall be of glass fiber in heavy cardboard frame with suitable retainers to hold the media in place and shall be change out as necessary maintain clean ductwork and equipment. Immediately prior to test and balance, provide a complete set of “start-up” filters equal to the permanent filters for the purpose of test and balance.

2.1.2 Provide two (2) complete sets of each type of filter for each piece of air moving equipment, in addition to “start-up” filters for test and balance purposes. Provide Architect documentation, signed by the Owner, that these additional filters have been turned over to the Owner.

2.1.3 All permanent filters for the air moving equipment (including, but not limited to, air handling units, packaged units, pt boxes, etc.) shall be 2" thick Farr 30/30 MERV 8 efficient pleated throw-away filters.

2.2 EXHAUST FANS: <S> <OM>

2.2.1 Ceiling exhaust fans shall be equal to Greenheck Model CSP/SP 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, and include a solid state speed controller mounted on the fan. 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 and wall/roof cap with birdscreen.

2.2.2 Upblast roof exhausters shall be of the belt-driven centrifugal vertical discharge type Greenheck Model CUBE or Cook Model VCR and have capacity as scheduled on the drawings. The fan shall be complete with built-in grease trap and drain, centrifugal type wheels, automatic shutters, non-fused disc switches, birdscreens, hinging kit, cleanout port, vented curb extension, heat baffle and suitable motor and belt guards. Motor and drives shall be isolated from exhaust air steam with cooling air tube from a location free of discharge contaminants. Exhausters for kitchen hoods shall be U.L. 762 listed and labeled for grease exhaust applications. Fan shaft shall be mounted in lubricated pillow block ball bearings suitable for air handling applications with a minimum (L-10) life in excess of 100,000 hours. Drives shall be sized for a minimum of 150% of motor horsepower. Motor pulleys shall be adjustable. Motor and drive shall be mounted on vibration isolators.

Fans shall be fabricated with factory fabricated roof curb. All fans shall bear the AMCA seal for air and sound performance.

2.2.3 Acceptable Manufacturers: Greenheck, Loren Cook, Acme, Twin City Fan.

2.3 MOTOR STARTERS: <S> <OM>

2.3.1 Starters shall be NEMA approved magnetic, line voltage type 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.

2.3.2 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.

2.3.3 Motor starters shall be provided for all motors 1 HP and above and all motors requiring automatic control, unless indicated otherwise on the plans.

2.4 DUCTLESS MULTI-SPLITS (MS): <S><OM>

2.4.1 System Description

The air conditioning heat pump system shall be a Daikin or Mitsubishi Electric split system heat pump series or approved equal. The system shall consist of a slim silhouette, compact, wall mounted indoor fan coil section with wireless remote controller and a slim silhouette horizontal discharge outdoor unit with constant speed compressor, charged with R410A refrigerant.

2.4.2 Quality Assurance

- a) The units shall be tested by a Nationally Recognized Testing Laboratory (NRTL) and bear the ETL label.
- b) All wiring shall be in accordance with the National Electrical Code (N.E.C.).
- c) The units shall be rated in accordance with Air-conditioning Refrigeration Institute's (ARI) Standard 210 and bear the ARI Certification label.
- d) The units shall be manufactured in a facility registered to ISO 9001 and ISO14001 which are a set of standards applying to environmental protection set by the International Standard Organization (ISO).
- e) A pressure charge of R410A refrigerant sufficient for 25 feet of refrigerant tubing shall be provided in the condensing unit.
- f) A dry air holding charge shall be provided in the indoor section.
- g) System efficiency shall meet or exceed 12.5 SEER.

2.4.3 The units shall have a manufacturer's parts and defects warranty for a period one (1) year from the date of the original installation. The compressor shall have a warranty of 10 years from date of substantial completion. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

2.4.4 Manufacturer shall have over 25 years of continuous experience in the U.S. market.

2.4.5 Indoor Unit General

- a) The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, internal piping, control circuit board and fan motor.
- b) The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch.
- c) Indoor unit and refrigerant pipes shall be charged with dry air before shipment from the factory.

2.4.6 Unit Cabinet

- a) The casing shall have a white finish.
- b) Multi directional drain and refrigerant piping offering four (4) directions for refrigerant piping and two (2) directions for draining shall be standard.
- c) There shall be a separate installation plate which secures the unit firmly to the wall.

2.4.7 Fan

- a) The indoor unit fan shall be an assembly with a line-flow fan direct driven by a single motor.
- b) The fan shall be statically and dynamically balanced and run on a motor with permanently lubricated bearings.

- c) A manual adjustable vertical guide vane shall be provided with the ability to change the airflow from side to side (left to right).
- d) An integral, motorized air sweep flow louver shall provide an automatic change in airflow by directing the air up and down to provide for uniform air distribution.
- e) The indoor unit fan motor shall operate in three (3) selectable speeds, High, Medium and Low.

2.4.8 Filter

Return air shall be filtered by means of easily removed Catechin air filter and an anti-allergy enzyme filter – blue bellows type.

2.4.9 Coil

- a) The indoor unit (evaporator) coil shall be of nonferrous construction with smooth, pre-coated aluminum fins on copper tubing.
- b) Tubing shall have inner grooves for high efficiency heat exchange
- c) All tube joints shall be brazed with PhosCopper or silver alloy.
- d) The coil shall be pressure tested at the factory.
- e) A sloped condensate pan and drain with condensate pump and extension hose shall be provided under the coil.

2.4.10 Electrical

- a) The electrical power of the unit, supplied from the outdoor unit shall be 208 volts, 1 phase, 60 hertz. The system shall be capable of satisfactory operation within voltage limits of 103 volts to 127 volts.
- b) The unit shall be equipped with Mitsubishi Electric's micro-processor control system directing indoor and outdoor unit coordinated operation by two polarity sensitive control wires.
- c) The indoor unit shall not have any supplemental electrical heat elements.

2.4.11 Control

- a) This system shall have a wireless remote controller to perform input functions necessary to operate the system. The controller shall consist of a Power On/Off switch, Mode Selector, Temperature Setting, Timer Control, Fan Speed Select and Auto Vane Selector.
- b) Temperature changes shall be by 1°F increments with a range of 65°F to 87°F.
- c) There shall be a 24 hour On/Off timer.
- d) The unit shall have an emergency operation mode to allow operation without the remote controller.
- e) The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless remote controller, providing emergency operation and controlling the outdoor unit.
- f) The control voltage between the indoor unit and the outdoor unit shall be provided through an internal transformer.
- g) The system shall be capable of automatic restart when power is restored after power interruption.
- h) The control system shall control the operation of the air sweep louvers, as well as provide on/off and system/mode function switching.

2.4.12 Outdoor Unit General

The outdoor unit is designed specifically for use with MSZ series indoor units. These units are equipped with a circuit board that interfaces to the MSZ indoor unit circuit board. The outdoor unit shall be completely factory assembled, internally piped and wired. Each unit shall be run tested at the factory.

2.4.13 Unit Cabinet

- a) The casing shall be fabricated from zinc coated steel, bonderized with an electrostatically applied, thermally bonded, acrylic or polyester powder coating for corrosion protection.
- b) Case and mounting feet shall be as follows:
The base shall be of Aluminum-Zinc-Magnesium alloy coated steel, with welded mounting feet.

2.4.14 Fan

- a) The unit shall be furnished with a direct drive propeller type fan, statically and dynamically balanced for smooth and quiet operation.
- b) The fan motor shall have inherent protection, be equipped with permanently lubricated bearings. The fan motor shall be mounted and isolated for quiet operation.
- c) The fan shall be provided with a raised guard to prevent contact with moving parts.
- d) The outdoor unit shall have horizontal discharge airflow.

2.4.15 Coil

- a) The condenser coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing.
- b) The coil shall be protected with an integral metal guard.
- c) Refrigerant flow from the condenser shall be controlled by means of a metering orifice.

2.4.16 Compressor

- a) The compressor shall be a Mitsubishi Electric high performance, hermetic, rolling piston, rotary type.
- b) Compressor shall be mounted using rubber isolating bushings to avoid the transmission of vibration.
- c) Compressor shall be protected by an automatic over current relay and a thermal overload switch
- d) Compressor shall be warrantied for ten (10) years.

2.4.17 Operation

- a) The outdoor unit shall have an accumulator.
- b) The outdoor unit must have the ability to operate with a maximum height difference of 35 feet between indoor and outdoor units.
- c) The unit shall have a maximum refrigerant tubing length of 65 feet between indoor and outdoor units without the need for line size changes, traps or additional oil.
- d) The unit shall be pre-charged for a maximum of 25 feet of refrigerant tubing.

2.4.18 Electrical

- a) The electrical power of the system shall be 208 volts, 1 phase, 60 hertz.
- b) The outdoor unit shall be controlled by the microprocessor located in the indoor unit. The control voltage between the indoor unit and the outdoor unit shall be 208 volts, AC.

2.5 FURNACE – COIL UNITS: <S> <OM>

2.5.1 These units shall be Lennox, Carrier, Trane, York or McQuay and shall be equal to the model numbers as scheduled on the plans. The air conditioning units shall be complete with gas furnace, cooling coil, air-cooled condensing unit and thermostats. These units shall be Lennox, Carrier, Trane, York or McQuay and shall be equal to the model numbers as scheduled on the plans. The air

conditioning units shall be complete with gas furnace, cooling coil, air-cooled condensing unit and thermostats.

2.5.2 Gas furnace shall be complete with casing, heat exchanger, fan assembly, filters and wiring for heating and cooling operations.

- A. Casing shall be fabricated from 22 gauge steel, de-greased, bonderized and finished with baked-on enamel paint.
- B. The burner and heat exchanger shall be die-formed heavy gauge cold-rolled aluminized steel and shall have a ten year limited warranty.
- C. Fan assembly shall consist of blower motor and blower that are rubber mounted for vibration isolation control. Fans shall be either multi-speed direct drive motors or adjustable belt drive fans and motors.
- D. The units shall be factory wired for high and low voltage connections to accommodate the addition of coils and contents.
- E. The units shall be equipped with electronic spark ignition.

2.5.3 Cooling coils shall be complete with casing. Cooling coils shall be three row 3/8" O.D. seamless copper tube coils with heavy aluminum fins mechanically bonded to tubes. Coils shall have sweat connections, thermal expansion valve and holding charge for field piping. Coils shall be suitable for up flow and down flow installations. Coils shall have insulated drain pan with 3/4" drain connection. Casing shall be constructed of 20 gauge sheet metal and an enamel coat of paint.

2.5.4 The air conditioning unit manufacturer shall provide all controls and accessories (T-stats, expansion valves, filter-driers, combination sight and moisture indicator glass, piping and wiring diagrams for the units) necessary for a complete installation and satisfactory operation of the units. The thermostats shall be combination heating and cooling thermostats (two stage heat and single stage cool). The thermostats shall have a sub-base with a fan switch "OFF-ON-AUTO" and system switch "HEAT-OFF-COOL".

2.6 CONDENSING UNITS SERVING FURNACE COIL UNITS: <S> <OM>

Remote air-cooled condensing units shall be suitable for outdoor application. Units shall be ARI rated and UL listed. Condensing units shall be complete with a factory finished galvanized steel cabinet, aluminum fin copper tube condenser coil, factory prewired electric service and control box, resiliently mounted hermetic compressor with crankcase heater, 5-minute time delay to prevent compressor short cycling, compressor start assist device, refrigerant service valves, direct driven condenser fan assembly arranged for top discharge, high and low pressure safety control switches and with low ambient control suitable for operation down to 0 degrees Fahrenheit ambient temperature with winter start control and evaporator freezestat. Manufacturer shall warrant each compressor for the condensing units for a period of one year.

Acceptable Manufacturers: Lennox, Carrier, Trane, York or McQuay.

2.7 PACKAGED AIR CONDITIONING UNITS – GAS HEAT: <S> <OM>

2.7.1 Furnish and install where shown on the drawings, unitary packaged air handling unit equipment including options and accessories as hereinafter specified. This portion of the specification covers gas heat units for constant volume duty. Units shall be certified in accordance with ARI Standard 210.

Gas heat/electric cool units shall be tested and certified in accordance with AGA safety requirements as a total package.

Units shall be for slab mounting outdoors as shown on the drawings and shall consist of compressors, condensers, evaporator coils, condenser and evaporator fans, refrigeration and temperature controls, filters and outdoor air damper for minimum vent air. Units shall be either down discharge or horizontal discharge as shown on the drawings.

2.7.2 The cabinet shall be constructed of galvanized steel, bonderized and coated with a baked enamel finish. Cabinet interior shall be insulated with 1" thick neoprene coated fiberglass. Cabinet panels shall be easily removable for service access to all operating components. A condensate drain connection shall be routed from the unit and terminated as indicated on the plans and in accordance with state and local codes.

2.7.3 Indoor blowers shall be forward curved centrifugal type capable of delivering the required CFM at the external static pressure as specified in the equipment schedule. Units above 5 tons in cooling capacity shall have belt driven fans. Indoor blower motors shall have permanently lubricated bearings. Outdoor fans shall be of the propeller type, direct drive, with permanently lubricated bearings and shall discharge air upwards.

2.7.4 Indoor and outdoor coils shall be of non-ferrous construction with aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.

2.7.5 Compressor(s) shall be fully hermetic or semi-hermetic with unloading and shall have suitable vibration isolators and crankcase heaters. Compressors shall be furnished with a limited 10-year warranty covering the compressor and compressor motor. Compressors shall be capable of operation down to 0 degrees Fahrenheit outdoor air temperature. Compressors shall be provided with the following minimum protections:

- A. overcurrent
- B. over-temperature
- C. short cycle (minimum 5 minutes before restart)
- D. loss of refrigerant (low pressure)

2.7.6 The heat exchanger shall be constructed of minimum 20 gauge steel with an alumagard steel coating for corrosion resistance. The heat exchanger shall have a 10-year non-prorated limited warranty. The burners shall be constructed of stainless steel and shall be of the bunsen (aerated) slotted port design.

2.7.7 Heating controls shall consist of a redundant gas valve, intermittent pilot ignition, electronic spark ignition system, high limit switches, a forced draft combustion air fan with a centrifugal switch for pilot proving safety control and rollout switch.

2.7.8 Thermostat assembly shall be provided for staged heating and cooling with manual or automatic changeover and standard subbase. Alternate subbase shall be available and include compressor malfunction light (lockout) designed to illuminate if the compressor lockout is activated.

2.7.9 Unit shall include the following accessories:

- a. remote potentiometer
- b. coil hail guards
- c. roof curb
- d. full perimeter isolation rail
- e. 10-year compressor warranty
- f. disconnect switch
- g. convenience receptacle (factory wired)

2.7.10 Acceptable Manufacturers: Trane, Carrier, Lennox, York or McQuay.

PART 3 - EXECUTION

Not used.

END OF SECTION

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 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 32 13-ALTERNATE POWER SYSTEMS
 SECTION 26 43 13-SURGE PROTECTIVE DEVICES
 SECTION 26 50 00-LIGHTING

DIVISION 27-COMMUNICATION

SECTION 27 05 00-FIRE ALARM SYSTEM
 SECTION 27 05 33-CONDUITS AND BACKBOXES 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 (highlighting, 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 not 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 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.
- B. For renovation projects, or projects where additions are being made to any existing building(s) or campus, the contractor shall be *required* to visit the site to field verify existing conditions prior to submitting a proposal. Any cost associated with any conflicts and/or changes that arise during construction due to the contractor's failure to field verify existing conditions shall be the sole responsibility of the contractor and not the owner.
- C. All proposals shall take these existing 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 in mechanical unit, smoke dampers, etc..
- 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.

3.14 DEMOLITION AND SALVAGE:

- A. Where demolition of equipment or materials is required, this Contractor shall minimize cutting and exercise all due caution to leave undamaged surfaces, material and equipment meant to remain.
- B. All existing items that are to be removed shall remain property of the owner unless declared as salvage. Salvage materials shall become property of the contractor and be removed from the site. Items declared as the owner's property shall be neatly stored on the site as directed by the owner.
- C. Please note that demolition of the HVAC system will require electrical work and coordination. Refer to the Architectural specifications for additional information regarding the phasing of the construction.
- D. Existing electrical equipment (except cast-in-place conduit) such as panelboards, wiring devices, lighting fixtures, junction boxes, etc., are to be removed from the job. Where a circuit is interrupted by removal of a device or fixture from that circuit, install wire and conduit as required to restore service to the remaining devices and fixtures on that circuit.

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 and every conductor regardless of type or voltage at panelboards, pull boxes, and outlet and junction boxes or utilization devices.

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: <S>

- 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: <S>**

- 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 multi-conductor 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 liquid-tight flexible conduit with watertight connectors in damp or wet locations. Limit seal-tight length to 24", unless approved in writing by Engineer.
- 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; service entrance cable; armored cable; metal clad cable; and wiring connectors and connections.
- B. Related Sections:
 - 1. Section 26 05 53 - 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: (MC cable may be used if approved by architect and local code official)

- A. Product Requirements: Provide products as follows:
 - 1. Conductor not smaller than 12 AWG for power and lighting circuits.
 - 2. Conductor not smaller than 14 AWG for control circuits.
 - 3. 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.
 - 4. 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 150 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. Copper conductors only, shall be used on this project.

1.5 SUBMITTALS: <S>

- 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 <S>**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.

2.2 WIRING CONNECTORS: <S>

- 2.3.1 All splices, taps, connections, terminations, etc., shall be made with appropriate connectors in a workmanlike manner and in compliance with the N.E.C.
- 2.3.2 All home runs shall be #12 or larger as indicated. Provide #10 where home runs exceed 75 feet in length. No wire smaller than #12 shall be permitted serving lighting or outlets (see Section 26 50 00 for exception).

- 2.3.3 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 indentation type properly taped and U.L. Listed for conductor size and quantity.

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 from the building structure.

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. and under provisions of Section 26 05 53. Identify each conductor with its circuit number and/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. All conductors shall be in conduit.
- H. No more than three (3) current carrying conductors shall be installed in a single raceway. All branch circuit current carrying conductors shall be provided with a dedicated neutral.
- I. Install solid conductor for feeders and branch circuits 10 AWG and smaller.
- J. Install stranded conductors for branch circuits 10 AWG and larger. However, when stranded conductors are used in lieu of solid, then install crimp on fork terminals for all device terminations. Do not place bare stranded conductors directly under screws.

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.

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.

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 the latest applicable edition of NFPA 70.
- 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 and with plastic sheathing.
- 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 GROUND 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: Solid copper
- B. Foundation Electrodes: 4 AWG
- C. Grounding Electrode Conductor: Copper conductor
- 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 existing 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 well pipe with cover at each rod location. Install well pipe top flush with finished grade.
- E. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing. Electrically bond steel together.
- F. Bond together metal siding not attached to grounded structure; bond to ground.
- G. Bond together reinforcing steel and metal accessories in pool and fountain structures.
- H. 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 continuity testing in accordance with IEEE 142.
- D. When improper grounding is found on receptacles, check receptacles in entire project and correct. Perform retest.
- E. Perform, record and submit in writing, leakage current tests in accordance with NFPA 99.

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 and plastic sheathing.

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 "1-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 "1-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 system will not be permitted. 3/8" flexible conduits or whips for lighting connection may be supported to ceiling grid support system with caddy clamps or cable ties.

Grouped raceways shall be supported with galvanized steel channel assemblies.

	<u>Kindorf</u>	<u>Globe Strut</u>	<u>Unistrut</u>
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, only as directed.
 - 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: <S>

- 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. All conduit 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 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 existing 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.
- D. Grade all raceways away from the service entrance equipment to prevent water damage. Cap ends of raceways to prevent entrance of water and other foreign material during construction.

3.6 INSTALLATION – SLEEVES: <S>

Exterior watertight entries: Seal with adjustable interlocking rubber links and sleeve for:

- A. Watertight entry.
- 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 53 - Identification for Electrical Systems.
 5. Section 26 27 26 - Wiring Devices.
 6. 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 PVC. 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 PVC coated conduit. Provide cast or nonmetallic boxes.

- E. Outdoor Locations, Above Grade: Provide rigid steel conduit or EMT as approved by architect. Provide cast metal pull, and junction boxes.
- F. In Slab Above Grade: Provide rigid steel PVC coated 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: 1/2 inch in walls and 3/4 inch elsewhere 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.

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 <S>

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). (Excluding roof mounted conduits.)

- 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 Engineer. Provide a separate neutral for each phase leg in the raceway unless shown otherwise on the drawings.
- Z. Flexible metal conduit may be used for final connections to lighting fixtures and to motors, transformers and other equipment subject to vibration. Maximum length permitted is 72".

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 at no additional cost.
- 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 luminaires 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: <S>

- 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

2.1 DESCRIPTION:

- A. Product Description: Laminated three-layer plastic with engraved letters on contrasting background color.
- 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.
- B. All equipment shall be labeled by its designation, voltage, phase and number of wires. Example: Panel L1-208V, 3 phase, 4-wire.

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. 480 Volt System: Black lettering on white background.
 2. 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 UNDERGROUND WARNING TAPE:

- A. Description: 4 inch wide plastic tape, colored red and yellow with suitable warning legend describing buried electrical lines.

2.6 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.
 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. 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.
- G. 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 SECTION INCLUDES

- A. This section includes the provision of a lighting control system for the automatic dimming and deactivation of indoor lighting, except for lighting intended for 24-hour operation.

1.2 RELATED SECTIONS

- A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables
- B. Section 26 05 33.11 - Raceways and Conduits for Electrical Systems
- C. Section 26 05 53 - Identification for Electrical Systems
- D. Section 26 08 00 - Commissioning of Electrical Systems
- E. Section 26 27 26 - Wiring Devices

1.3 REFERENCES

- A. NEMA Guide Publication WD 7 Occupancy Motion Sensors Standard
- B. International Energy Conservation Code (IECC) - version 2021

1.4 DEFINITIONS

- A. Motion Sensor - A sensor that detects when an occupant is in a space. This sensor can be wired or configured to be an occupancy sensor or vacancy sensor.
- B. Occupancy Sensor - A motion sensor designed or programmed to automatically turn the lighting in a space "on" when an occupant enters the space (based on major motion) and automatically turn the lighting in a space "off" after the occupant is no longer present or detected (based on minor motion) for a predetermined length of time.
- C. Vacancy Sensor - A motion sensor designed or programmed to require an occupant to manually turn the lighting in a space "on" and automatically turn the lighting in a space "off" after the occupant is no longer present or detected (based on minor motion) for a predetermined length of time.
- D. Dual Technology Sensor - A motion sensor with both infrared and ultrasonic technologies or both infrared and microphonic technologies.
- E. Photocell - A light sensitive sensor used to communicate with a room controller to dim the lighting in a daylight zone according to the ambient lighting entering a space via any method other than electric lighting.
- F. Room Controller - The local space lighting controller that interfaces with the luminaires, motion sensors, photocells, smart switches, etc. in each space to control on/off, "scenes", dimming, and daylight harvesting. This may include the power pack, distributed controller, driver interface modules, interface components, etc. Some or all of this function may be an integral part of the luminaires in the space.

- G. Energy Management Control System (EMCS) - May also be called Building Management System (BMS). This system is used to control mechanical systems in the building via PC software.
- H. Smart Switch - Intelligent programmable switch capable of communicating with the lighting control system in the space to trigger on/off, "scenes", dimming, etc.
- I. Network Controller - The building-wide controller that connects Room Controllers together into a central network.
- J. Daylight Zone - Area in a space around/about a window, skylight, or other fenestration measuring how far exterior natural lighting can reach into a space. Not all daylight zones can be combined. Luminaires in a daylight zone are to be controlled separately from the luminaires in the rest of the space. Some daylight zones, after they are identified in a space, will not require any change to the lighting controls already shown and may therefore be disregarded. Those will usually be deleted from the reflected ceiling plans to prevent confusion.
- K. Functional Testing - Start-up or testing performed by the manufacturer or certified representative to verify the operation of the complete lighting control system.
- L. Commissioning Agent - Third party hired by Owner or the design team to meet IECC commissioning requirements.

1.5 DESIGN REQUIREMENTS

- A. The system shall include all required devices for a complete and proper operating system to automatically control the lighting to meet the intent of the IECC. The system may include but not be limited to motion sensors, room controllers, enhanced building controls (if required), low voltage control wiring, photocells, smart switches, intelligent luminaires and all required boxes.
- B. Sensor design and layout: Provide the quantity of motion sensors required for complete and proper coverage without gaps within the range of coverage of controlled areas. Rooms shall have 100% coverage to completely cover the controlled area to accommodate all occupancy habits of single or multiple occupants at any location within the room. The locations and quantities of sensors shown on the drawings are diagrammatic and indicate only rooms that are to be provided with sensors. Provide additional sensors if required to properly and completely cover the respective room. Proper judgment must be exercised in executing the work so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components.
- C. Not all required components are shown on the plans.
- D. A networked distributed lighting control system is required. Relay panels are not acceptable unless noted on Lighting Control Chart.
- E. Battery operated devices and controls are not acceptable.
- F. Refer to Luminaire Schedule and Lighting Control Chart for additional requirements and more information.

1.6 PERFORMANCE REQUIREMENTS

- A. All Spaces:
 1. Refer to the reflected ceiling plans and Lighting Control Chart for additional information and requirements for controlling the lighting in various areas throughout the building. For projects beyond the scope of a single system, multiple systems shall be networked together to accommodate any size requirement.
 2. When the fire alarm activates an alarm, the lighting controls shall turn all interior and exterior building-mounted lights on to meet NFPA 101 section 7.8.1.2.2 requirements. This

feature shall be provided via a single contact closure at the fire alarm control panel (FACP) as a trigger to the lighting control system. Provide all associated hardware and wiring from the FACP to the lighting control system necessary for a complete and working system. Refer to Lighting Control Chart for additional information.

3. All portions of the controls mounted above ceiling are to be plenum rated.
 4. If a generator or UPS provides backup/auxiliary power to any luminaires, then power shall be provided for all lighting controls in those spaces such that all functions of the lighting control system remain operable under any power condition.
 5. If a generator or UPS provides emergency power to any emergency luminaires, all emergency luminaires shall turn on to maximum lumen output. If battery packs provide power for emergency lighting, all emergency luminaires shall turn on to maximum lumen rating of the battery pack.
 6. Wiring between sensors and control units shall be 18 AWG minimum (stranded preferred) or CAT5/5e/6. Wiring shall be plenum rated in plenum spaces and UL listed. Pre-terminated low voltage wiring from the lighting controls manufacturer is preferred.
 7. See the Sequences of Operation article in this specification section.
- B. Motion Sensors
1. All motion sensors are to be corner (preferred) or ceiling mounted except in single toilets or small closets (< 40sqft) or unless otherwise indicated on the drawings.
 2. Where allowed, wall-mounted motion sensors shall be suitable for 120v or 277v lighting.
 3. All motion sensors shall be dual technology.
 4. All motion sensors to be set to a 20-minute time delay and adjusted to maximum sensitivity, unless otherwise noted on the drawings. Must be capable of being set down to 5 minutes and 1 minute for testing.
 5. Coverage areas for major motion and minor motion shall be determined in accordance with Section 3 of NEMA WD 7 Guide.
 6. Ultrasonic technology shall utilize a frequency that does not interfere with other sensors, hearing aids, smartboards, etc.
 7. All motion sensors on this project shall have masking or internal shielding available to control coverage pattern in the field. Stickers or other external adhesive masking will not be accepted.
- C. Timer Switches: Where indicated on the plans, a timer switch control function shall have an override not exceeding 2 hours to meet code.
- D. Smart Switches
1. The smart switch shall control the luminaires in the space for all on/off, dimming and/or "scene" controls as indicated in the Lighting Control Chart on the drawings.
 2. For device color and cover/trim color, see specification section 26 27 26.
 3. The smart switch is to be used as a manual override when used with vacancy sensors.
 4. Where keyed switches are indicated on the plans, the "off" feature of the smart switch is to be disabled for a schedule similar to 7a-5p. Coordinate exact schedule with Owner.
 5. All programmable switches are to be engraved or internally labeled so that the function of each button is clearly identified. All labeling or engraving must be of high quality and be provided by the lighting system manufacturer.
- E. Room Controller
1. In the event of a hardware or software or component failure, the lighting in the space is to default to the "ON" position.
 2. Provide adequate room controllers in each space for proper operation of the lighting to meet all code requirements and design intent shown on the plans.
 3. All room controllers shall utilize zero-crossing circuitry.
- F. Network Controller
1. Shall be capable of being programmed/reprogrammed via PC software. It shall be capable of receiving input via contact closure, user PC software, fire alarm control panel, etc., and

- issuing building-wide commands to enable/disable a scene at all luminaires inside and outside the building.
 - 2. Shall include astronomical time clock capable of seven different day types per week, automatic holiday "shutoff" feature for 24 hours, 12-hour minimum program backup capabilities to meet code.
 - 3. Shall be BTL BACNET/IP listed for use to communicate with EMCS and HVAC.
- G. See Lighting Control Chart on the drawings for controls by space and sequence of operation.

1.7 PRODUCT DATA

- A. Submit product data for all components and accessories of the lighting control system including, but not limited to:
 - 1. Motion sensors
 - 2. Photocells
 - 3. Smart switches
 - 4. Time switches
 - 5. Room controllers
 - 6. Software
 - 7. Lighting contactors
 - 8. Low voltage wiring
 - 9. Intelligent luminaires
- B. Product data for motion sensors shall clearly indicate coverage areas for major motion and minor motion determined in accordance with the testing procedures of NEMA Guide Publication WD 7 Occupancy Motion Sensors Standard.
- C. Submit a warranty letter with warranty requirements per this specification including and describing coverage for systems that use multiple product brands to provide a complete system.
- D. Any product submitted other than from the manufacturers listed below in Part 2 will be rejected.

1.8 SHOP DRAWINGS

- A. Submit shop drawings of each reflected ceiling plan in this project showing the specific locations of all parts of the lighting control system including motion sensors, photocells, smart switches, room controllers, enhanced building controls (if required), etc. Motion sensors shown shall include sensor type, sensor mounting, and other pertinent data to allow evaluation of the proposed system.
- B. Submit a wiring diagram for all motion sensors, photocells, smart switches, room controllers, etc.
- C. Submit a sequence of operations for each unique space type describing the function of each button on each switch and the effects on the lighting in the space. This sequence of operations should be similar to the Lighting Control Chart with the added information describing how the lighting control system pieces/parts work together.
- D. Submit a list of switch types by unique space with a list of proposed button labels. This list should be similar to the Button Info on Lighting Control Chart with added information showing switch button layouts and actual labels for this project.

1.9 CLOSEOUT SUBMITTALS

- A. Operating and Maintenance Manuals: Provide 2 complete sets of operating, maintenance, and adjustment instructions and other information necessary for proper operation of the lighting control system. These documents shall be included as part of the project operating and maintenance manuals.

- B. As-built Drawings: Provide 2 complete sets of as-built reflected ceiling plans showing the location and wiring configuration of all motion sensors, room controllers, photocells, etc.
- C. Warranty: Provide 2 copies of warranties.
- D. Training Documentation: Provide a letter in the final documents documenting that Owner (give name of person, date, duration, and content of training) received training required in this section.
- E. System Functional Testing Documentation: Provide two (2) copies of documentation reporting the manufacturer's start-up, adjusting, and final testing of the completed installation. Include a list of controllable points to the BMS provider upon completion of lighting controls functional testing.
- F. Software Maintenance Agreement: Provide 2 copies of the software maintenance agreement.

1.10 REGULATORY REQUIREMENTS

- A. UL Label: All lighting control system products shall be UL-labeled, individually and as a system, for the specific applications utilized on this project.

1.11 MOCK-UPS

- A. Provide a product demonstration by the manufacturer of the lighting control system including a sample of each piece and part demonstrating a complete working system. If a product demonstration is not acceptable by Owner or Architect, provide, at additional cost, a mock-up of required space types with complete controls for owner/engineer/construction administration review before installation throughout the building.

1.12 PRE-INSTALLATION MEETINGS

- A. Meet with the manufacturer of the lighting controls on-site to review installation, wiring methods, and exact equipment locations of all components prior to starting installation. At this meeting, Contractor shall be trained by the manufacturer or vendor on the installation, setup, and functionality of the system. Failure to have this meeting will result in Contractor assuming full responsibility of all costs incurred to move controls and sensors, replace equipment due to product damage, costs due to installation errors or failure to meet the full intent of the design.

1.13 STORAGE AND PROTECTION

- A. Store all product in accordance with manufacturer's storage requirements.

1.14 WARRANTY

- A. Provide a five-year parts and one-year labor warranty on the entire control system. Warranty coverage shall begin at the time of Project Substantial Completion.

1.15 SYSTEM STARTUP

- A. Provide the initial programming, aiming, and start-up of the system.
- B. After system startup and prior to substantial completion of the project, require the manufacturer to test the operation of the complete system (all pieces, every space) to ensure the proper operation of the system throughout the range of building operating conditions. Provide documentation of such functional testing in the closeout submittals. Do this functional testing on all projects, regardless of other additional commissioning or testing requirements.

1.16 OWNER'S TRAINING

- A. After functional testing is complete, manufacturer shall provide a minimum of 4 hours of on-site training to Owner's personnel in the operation, adjustment, and maintenance of the system. Do

this training in a location where it can be recorded by Owner. Coordinate date, time and location of training one week prior to meeting and provide documentation of such training in the closeout submittals.

1.17 THIRD PARTY COMMISSIONING

- A. In addition to functional testing by Contractor and the manufacturer, additional third party commissioning is required to meet IECC requirements. The manufacturer shall be present during the third-party commissioning process. See specification section 26 08 00 for more information.

1.18 MAINTENANCE SERVICE

- A. Provide a three-year manufacturer's software service agreement with the system. The agreement shall cover all minor updates, bug fixes, and maintenance to the software of the system to maintain all original functionality. The software service agreement shall start at the time of substantial completion.

1.19 SYSTEM SUPPORT

- A. Provide five-year complete system support starting from substantial completion. The entire lighting control system (hardware and software) shall be included in the support. The support shall include phone and email communication (as a minimum) for the duration of the support. The system support shall include all technical support, hardware and software questions, warranty help, etc.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. If they comply with these specifications, products of the following, and only the following, manufacturers will be acceptable:
 1. Acuity Controls - Chris Sears at 214-658-9030
 2. Crestron - Chris Sears at 214-658-9030
 3. Eaton Controls - Allen Pilgrim at 817-267-9300
 4. Current NX Controls (formerly Hubbell Controls) - Brian Ross at 501-301-8739
 5. Intelligent Lighting Controls - Allen Pilgrim at 817-267-9300
 6. Lutron - Randy Schwimmer at 972-406-8700
 7. Philips Controls - Brendan Kenna at 214-247-7415
 8. WattStopper - Brian Ross at 501-301-8739
- B. No other manufacturers will be accepted.

2.2 MANUFACTURED UNITS

- A. All parts of the lighting control system shall be warranted by the same company.
- B. All parts of the lighting control system shall be from the approved list of manufacturers above.
- C. All parts of the lighting control system shall be aesthetically compatible. i.e., from the same product line or family of products.
- D. All sensors shall be from the latest release generation. Do not mix product of different releases or generations.

PART 3 EXECUTION

4.1 SITE VERIFICATION OF CONDITIONS

- A. If the work is to be performed in an existing facility, visit the site of the proposed work and observe its conditions so that you may be fully informed as to the materials, labor, workmanship, and conditions under which the work is to be done. If an existing lighting control system exists, then the new system shall work with the existing system.
- B. No allowances shall be made on account of any errors, negligence, or failure to be aware of the condition of the existing site.

4.2 INSTALLATION

- A. General
 - 1. Provide all lighting controls as required and where indicated, in accordance with manufacturer's written instructions and project shop drawings, applicable requirements of the NEC, and recognized industry practices to ensure that products serve the intended function.
 - 2. Provide the room controller as required located above the ceiling above the switches near the exit door. Provide a permanent label on the ceiling t-grid to identify its location. The label material shall be as described in specification section 26 05 53. The label shall say "Lighting Controller". It is acceptable for a room controller to serve more than one space.
 - 3. Provide the network controller as required located on the wall of the main electrical room near any EMCS, contactors, etc. It is acceptable for a single network controller to serve an entire building if supported by the controller.
 - 4. Provide conduit and wiring in accordance with specification sections 26 05 33.11 and 26 05 19.
 - 5. All motion sensors and switches located in gyms, play areas, multipurpose spaces, etc. shall have a wire guard.
- B. Shop Drawing Preparation: At least five working days prior to bid time, provide a set of floor plan drawings and a copy of these specifications to the manufacturer for the purpose of system layout with quantities and creating shop drawings for the owner. Coordinate with the manufacturer to determine the required medium (hard copy or electronic) and the format required by the manufacturer.
- C. Sensor Design and Layout by Manufacturer:
 - 1. Refer to Design Requirements article regarding sensor design and layout.
 - 2. Exact locations of control unit hardware boxes shall be based on observing good installation practice and shall be coordinated with other elements of the reflected ceiling plan. Control unit hardware shall be fully concealed.
 - 3. Select the appropriate type of sensor for complete coverage of each space.
- D. Lighting Control System Integration with EMCS:
 - 1. Exterior lighting shall be integrated into lighting control system or EMCS through BACnet interface.
 - 2. Provide BACnet object list to EMCS contractor.
 - 3. Contractor to expose BACnet objects related to footcandle levels, motion sensor status, and commanded light levels for each space.
 - 4. BACnet objects need to be labeled or mapped to the room number they are serving.
- E. Lighting Control Cable Routing and Installation:
 - 1. System wiring and equipment installation shall be in accordance with good engineering practices as established by the EIA and the NEC. Wiring shall meet all state and local electrical code requirements.
 - 2. Cable pathways, conduit, and cable support systems shall be complete with bushings, deburred, cleaned, and secure prior to installation of cable.

3. All wiring shall test free from opens, grounds, or shorts. All lighting control cable shall be supported from the building structure and bundled. Do not attach any supports to joist bridging or other lightweight members.
 4. Support system shall provide a protective pathway to eliminate stress that could damage the cabling. The lighting control cable shall not be crushed, deformed, skinned, crimped, twisted, or formed into tight radius bends that could compromise the integrity of the cabling.
 5. Lighting control cable must not be fastened to electrical conduits, mechanical ductwork/piping, sprinkler pipes, or routed to obstruct access to hatches, doors, utility access panels, or service work areas. Do not route cables through fire doors, ventilation shafts, grates, or parallel with line voltage electrical conductors. Lighting control cables shall not be run loose on ceiling grid or ceiling tiles.
 6. Support shall be provided by mounting appropriate fasteners that may be loaded with multiple cables. Provided that the weight load is carried by the support rod or wire, the support assembly may attach to the ceiling grid for lateral stabilization. The required support wires for the ceiling grid or luminaires shall not be utilized. Any fastener attached to the ceiling grid shall not interfere with inserting or removing ceiling tiles. The cable pathway of supports must be positioned at least 12 inches above the ceiling grid.
 7. Provide bushings to protect the cable from damage for conduit ends, box openings, and passage through metal studs.
 8. Lighting control cables shall be run in bundles above accessible ceilings and supported from building structure. Cabling shall be loosely bundled with cable Velcro hook ties randomly spaced at 30 to 48 inches on center, cable ties shall not be tight enough to deform cabling and shall not be used to support the cabling.
 9. Each cable run shall include a three-foot service loop with Velcro hook ties located in the ceiling above each device. This is to allow for future re-termination or repair.
 10. Lighting control cable will not be installed in the same conduit, raceway, tray, duct, or track with line voltage electrical cable without a metallic barrier meeting NEC requirements.
 11. Maximum cable pulling tension should not exceed 25 pound-force (110 N) or the manufactures recommendation, whichever is less.
 12. Any pulling compounds utilized must be approved by the cable manufacturer and shall not degrade the strength or electrical characteristics of the cable.
 13. No terminations or splices shall be installed in or above ceilings, other than in designated end point housings.
 14. Cable bends shall not be tighter than the manufacturer's suggested bend radius.
 15. Mount all equipment firmly in place. Route cable in a professional, neat, and orderly installation.
- F. Lighting Control Cable Support
1. Conduit, duct, or track shall be used for lighting control cable in exposed areas.
 2. Cable fill shall not exceed the manufacturers' instructions for each type of support.
 3. All conduit, ducts, track, and raceways shall be supported from the structure at industry standard intervals for the size specified, utilizing proper anchoring devices.
 4. All vertical supports shall be attached to the building support structure or concrete ceiling with anchors load rated for 100 lbs. minimum. Down rods shall be a minimum of 1/4" diameter. Steel uni-strut cross supports shall be 2" minimum.
- G. Bushings
1. Provide a plastic snap in bushing at each box opening, passage through a metal stud, and at the end of all open conduit stubs or sleeves prior to lighting control cable installation to protect the cabling from damage:
 - a. Box openings - Thomas & Betts Knockout Bushing Series 3210, or equivalent.
 - b. Metal stud passage - Thomas & Betts Twist It Bushing Catalog Number SB1216-SC, or equivalent.
 - c. Conduit ends - Thomas & Betts Anti-Short Bushing Series 390 or Tite-Bite Combination Couplings Series 442, or equivalent.

- H. J-Hooks
1. Attachments for cabling support shall be spaced at approximately 48 to 60 inches on center. Cable bundles shall not be allowed to sag down more than 12-inches mid-span between attachments.
 2. All attachments shall be approved for category rated twisted pair cabling. Attachments shall be Caddy part numbers as follow, or equivalent, sized as follows:
 - a. CAT16HP, 1" diameter - Capacity 15 Category rated cables.
 - b. CAT21HP, 1.31" diameter - Capacity 40 Category rated cables.
 - c. CAT32HP, 2" diameter - Capacity 60 Category rated cables.
 - d. Split bundles greater than 2" dia. or provide cable tray.
 3. Do not mix different signal strength cables on the same J-Hook (i.e. fire alarm with data and telephone cable). Multiple J-Hooks can be placed on the same attachment point, up to the rated weight load of the attachment device.
- I. Cable Tie Wraps
1. Provide and install Panduit TAK-TY cable ties or equivalent.
 2. Velcro hook cable ties shall be furnished and installed to attach wire bundles to supports and for appropriate wire management as required.
 3. Hard plastic or metal tie wraps will not be allowed on any data grade cable (Category rated twisted pair cable).

4.3 SEQUENCES OF OPERATION

- A. Lighting Controls
1. The smart switch shall be required to be pressed to turn the lights on in all spaces where a vacancy sensor is required. Otherwise, an occupancy sensor may automatically turn the luminaires on. Two minutes prior to turning the lights off, the lighting controls shall dim the luminaires in the space to 50% of their previous output as a notification to the occupants that the controls will soon turn the lighting off. A momentary "blink" is allowed if luminaires are not dimmable. If the motion sensor is not triggered in two minutes, the lighting in the space is to turn off. If the motion sensor is triggered, the lighting controls shall dim the lighting back up to the previous lighting level and timeout is restarted. In spaces with timer switches, the system shall accept an override signal at any time either before or after the lighting is turned off. The occupant shall not be required to wait for the lights to go out before issuing the override.
 2. Where shown on the plans, a photocell is to be used to measure the light level and signal to the room controller to dim the luminaires continuously (from 100% to 15% or lower, including off) in the daylight zone to maintain a consistent (within +10% and -0%) lighting level in the space.

4.4 MANUFACTURER'S FIELD SERVICES

- A. Coordinate with the sales representative to coordinate the below requirements with the manufacturer.
1. The manufacturer shall provide instruction at the start of the job to Contractor regarding the proper installation of the system.
 2. As part of the system startup process, the manufacturer shall provide all initial field programming of the system.
 3. Using certified factory representatives, the manufacturer shall inspect the finished installation against the shop drawings and installation instructions.
 4. Using certified factory representatives, the manufacturer shall do functional testing of the finished installation. Submit documentation of the functional testing in accordance with Part 1 of this specification.

4.5 ADJUSTING

- A. Motion sensors may be affected by various conditions in the room. It may be necessary for Contractor to make adjustments, change the location or type of sensor to obtain proper operation in a specific room. Contractor/equipment manufacturer shall have final responsibility for proper operation and coverage of the system in each room and should therefore make labor allowance for such changes and adjustments. Contractor is also responsible for acquiring approval from Engineer for any changes or deviations from project specifications.
- B. Work with the manufacturer to correct all findings from manufacturer functional testing.
- C. Work with the manufacturer to correct all findings made by the third-party commissioning agent or registered design professional, whichever entity performs the commissioning service. This contractor is responsible for the entire lighting control system and luminaires to pass the commissioning inspection and reporting.
- D. Within 3 months of the date of Substantial Completion provide onsite service to adjust the system to account for actual occupied conditions.

4.6 OWNER'S TRAINING AND DEMONSTRATION

- A. Upon completion of testing and adjustment, demonstrate operation of the system to representatives of Owner.
- B. Instruct Owner`s personnel in proper maintenance, adjustment, and operation of the motion sensor lighting controls.
- C. Discuss with Owner the time clock feature programming requirements (on/off times and school schedule) and teach them to program the clock feature to match the required schedule.
- D. Upon completion of testing and adjustment (commissioning), Contractor and a direct employee of the equipment manufacturer (who is already familiar with the details of the project) shall demonstrate operation, proper maintenance, troubleshooting and adjustment of the lighting control system and all sensors throughout the building. Owner shall receive a minimum of 4 hours and a maximum of 8 hours in an on-site training session. The length of the training session shall be at the discretion of Owner. The training shall cover the following areas in detail:
 - 1. Scope of system: Review the as-built documentation with Owner to detail extent of system. Identify locations of all wall stations, wiring, and panels that fall within the scope of the lighting control system. Define clear lines of scope between lighting control system and EMS functions if applicable.
 - 2. Operation of system: Cover normal operation of switches, push buttons, LCD interfaces, and software (if provided). Provide documentation to Owner showing the operational zoning of controlled circuits and all time-clock events programmed into the Lighting Control System. Show Owner how to change and add/delete events.
 - 3. Maintenance and Troubleshooting of system: Detail any required or optional preventive maintenance actions required of Owner. Go over step-by-step procedures to troubleshoot all possible failure modes of each component type of the lighting control system. Cover procedure to get lights turned on in any space containing a lighting control system in the event the control system fails. Identify any specialized equipment necessary to support all the above actions.
 - 4. Service and Support of system: Identify nearest direct support contact for the manufacturer and provide both telephone and email contact details.

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>

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 VB II Series.
- 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: <S>

- A. Manufacturers:
 1. Cutler-Hammer, Model DH.
 2. Square D, Model AD.
 3. General Electric, Model TH.

- 4. Siemens, Model VB II Series.
- 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: <S>

- 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 MANUAL MOTOR CONTROLLER: <S>

- 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.

2.5 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.

	<u>Cutler-Hammer</u>	<u>Square D</u>	<u>General</u>	<u>Siemens</u>	
			<u>Electric</u>		
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.

2.6 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] [J] fuses. Obtain IEC Class 2 coordinated component protection.
- F. Enclosure: NEMA ICS 6, Type to meet conditions of installation.

2.7 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] [J] fuses.
- H. Enclosure: NEMA ICS 6, Type to meet conditions.

2.8 LIGHTING CONTACTORS: <S>

- 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] [J] fuses.
- I. Enclosure: NEMA ICS 6, Type to meet conditions.

2.9 DISTRIBUTION PANELBOARDS: <S>

- A. Manufacturers:
1. Cutler-Hammer, Model PRL4.
 2. Square D, Model I-Line.
 3. General Electric, Model Spectra.
 4. Siemens, Model P3, P4, and P5 Series
- B. Product Description: NEMA PB 1, circuit breaker type panelboard.
- C. Minimum integrated short circuit rating: 22,000 amperes rms symmetrical, fully rated.
- 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] [J] fuses.
- F. Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide 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.

2.10 BRANCH CIRCUIT PANELBOARDS:

- A. Provide panelboards rated and sized as indicated in the schedule and shown on the plans:

	<u>Cutler-Hammer</u>	<u>General Electric</u>	<u>Square D</u>	<u>Siemens</u>
Up to 240 Volts	PRL1	AQ	NQOD	P - Series
Up to 480 Volts	PRL2	AE	NF	P - Series
Power Distribution	PRL4	SPECTRA	I-Line	P - Series
Or equal by Siemens.				

- 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, fully rated.
- 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.

2.11 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.

	<u>Bussmann</u>	<u>Gould Shawmut</u>	<u>Little Fuse</u>
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.

	<u>Bussmann</u>	<u>Gould Shawmu</u>	<u>Little Fuse</u>
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 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.

3.3 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.

3.4 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.

3.5 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 26 05 33 - Raceway and Boxes for Electrical Systems: Outlet boxes for wiring devices.
 - 2. Section 26 05 34 - Floor Boxes for Electrical Systems: Service fittings for receptacles installed on floor boxes.
 - 3. Section 26 05 34 - Floor Boxes for Electrical Systems: Poke-through receptacles.

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: <S>

- 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: <S>**

- 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.

	<u>Hubbell</u>	<u>Leviton</u>	<u>P & S</u>
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: <S>

- A. Manufacturers:
- Substitutions: Section 01 60 00 - Product Requirements.
- B. Product Description: NEMA WD 1; Semiconductor dimmer for incandescent lamps.
- C. Body and Handle: Ivory plastic with linear slide.
- D. Voltage: 120 volts.
- E. Power Rating: As required for circuit load.
- F. Accessory Wall Switch: Match dimmer appearance

2.3 DUPLEX RECEPTACLE: <S>

Specification grade, AC, 20A 125V rating, automatic grounding clip, side and back wired (screw terminals):

	<u>Hubbell</u>	<u>Leviton</u>	<u>P & S</u>
standard	HBL 5352I	5362-I	5362-I
safety	HBL 8300SG	5362-SG	TR63H
isolated ground	IG5362	5362-IG	IG6300

Acceptable manufacturers: Arrow Hart, Bryant, G.E., Hubbell, Leviton, or P & S.

2.4 WALL PLATES: <S>

- A. Manufacturers:
- Substitutions: Section 01 60 00 - Product Requirements.
- B. Decorative Cover Plate: stainless steel.
- C. Jumbo Cover Plate: stainless steel.
- 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".

T & B
CKMUJ

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.
- 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 32 13: ALTERNATE POWER SYSTEMS**PART 1 - GENERAL****1.1 DESCRIPTION:**

- A. This section of the specifications includes the furnishing, installation, connection, and testing of the engine generator system consisting of the generator, transfer switches and auxiliary equipment.
- B. The engine generator system shall be fully automatic and shall constitute a unified and coordinated system ready for operation. The generator and transfer switch shall report alarm trouble and operation conditions to the building management system.
- C. The engine generator system shall include, but not be limited to, NATURAL gas engine, lube oil system, fuel oil system, cooling system, intake and exhaust system, starting system, generator, battery system, load transfer system, control system, fuel storage tank, and supervisory system.

1.2 RELATED WORK:

- A. Section 26 05 00, COMMON WORK RESULTS FOR ELECTRICAL.

1.3 QUALITY ASSURANCE:

- A. The supplier of the engine generator set shall be responsible for satisfactory total operation of the system and its certification. This supplier shall have had experience with three or more installations of systems of comparable size and complexity as regards to coordinating, engineering, testing and supervising. Each of these installations shall have been in successful operation for three or more years.

1.4 SUBMITTALS:

In accordance with section 01340, SAMPLES AND SHOP DRAWINGS, furnish the following:

- A. Shop Drawings and Product Data:
 - 1. Data shall be submitted in the following form:
 - a. Technical data sheets (TDS): These include published performance, rating and derating curves, published ratings, catalog cuts, pictures, manufacturer's specifications, material composition, and gauge thickness.
 - b. Description of operation (DO): Manufacturer's literatures and, if suitable, diagrams.
 - c. Shop Drawings (SD): Scaled drawings showing dimensions, plan views, side views, elevations and cross sections.
 - d. Diagrams (DGM): These include control system diagrams, elementary diagrams, control sequence diagram or table, wiring diagrams, interconnections diagrams, wireless connection diagrams, illustrative diagrams, and flow diagrams, and other like items.
- B. Prior to the final inspection deliver four copies, to the Architect of the following:
 - 1. A certificate by the manufacturer of the engine-generator set that the auxiliary electrical power system has been properly installed, adjusted and tested.
 - 2. Operation and Maintenance Manuals:

- a. Submit complete operating and maintenance manuals for the engine-generator set and auxiliaries including wiring diagrams, technical data sheets and information for ordering replaceable parts.
- b. Include complete interconnection diagrams which indicate all components of the system.
- c. Include complete diagrams of the internal wiring for each of the items of equipment.
- d. The diagrams shall have their terminals identified to facilitate installation, operation and maintenance.
- e. Furnish copies of complete lists of the spare parts and special tools recommended for two years of normal operation of the complete system including the manufacturer's names, addresses, catalog numbers and prices.
- f. Labeled terminal blocks with wire numbers.

1.5 JOB CONDITIONS:

A. Unless specified otherwise, each component of the engine-generator system shall be capable of operating as specified herein at 1000 feet above sea level which with average ambient air temperatures ranging from a minimum of 5 degree F in winter to maximum of 105 degrees F in summer.

PART 2 - PRODUCTS

2.1 ENGINE-GENERATOR SET - GENERAL:

- A. The engine generator system shall be in accordance with NFPA, UL, NEMA and ANSI, as specified and as shown on the drawings.
- B. Provide a complete fully automatic, NATURAL gas engine-generator system.
- C. Published Rating:
 - 1. Shall be 100 kW standby, 208Y/120 volts 3-phase, 4-wire, 60 Hz, 0.80 power factor.
- D. Assemble, connect and wire the equipment at the factory so that only the external connections need to be made at the construction site.
- E. Thoroughly clean and paint the metal surfaces at the factory with manufacturer's primer and standard finishes.
- F. Coordinate the components of the system and their arrangements, electrically and mechanically.
- G. Connections between components of the system shall conform to the recommendations of the manufacturer of the engine-generator set.
- H. Couplings, shafts, and other moving parts shall be enclosed and guarded. Guards shall be metal, ruggedly constructed, rigidly fastened and readily removable for convenient servicing of the equipment without disassembling any pipes and fittings.
- I. Protect the engine and its water cooling system at all times against freezing weather conditions.
- J. Shall have the following features:
 - 1. Mounted on a common, rigid, welded, structural steel base at the factory.

2. Shall automatically start, accelerate to the specified RPM and deliver the specified KW/KVA output at 60 Hz within 10 seconds after a single pole contact closes in a remote device.
3. Shall recover rapidly from instantaneous changes between no load and the specified KW/KVA rating, and the reverse changes of load, without damage.

K. Acceptable manufacturers – Generac, Kohler, Cummins or MTU.

2.2 NATURAL GAS ENGINE:

A. The prime mover shall be a liquid cooled, natural gas fueled, turbo-aftercooled gear drive engine of 6-cycle design. It will have 4 cylinders with a minimum displacement of 8.9 liters. The unit requires a minimum rated output of 100 kw at an operating speed of 1800 RPM.

B. The engine is to be cooled with a unit mounted radiator, fan, water pump, and closed coolant recovery system providing visual diagnostic means to determine if the system is operating with a normal engine coolant level. The radiator shall be designed for operation in 122 degrees f, 50 degrees c ambient temperature.

C. The intake air filter(s) with replaceable element must be mounted on the unit. Full pressure lubrication shall be supplied by a positive displacement lube oil pump. The engine shall have a replaceable oil filter(s) with internal bypass and replaceable element(s). Engine coolant and oil drain extensions, equipped with pipe plugs, must be provided to outside of the mounting base for cleaner and more convenient engine servicing. A fan guard must be installed for personnel safety.

D. The engine shall have a battery charging DC alternator with a transistorized voltage regulator. Remote 2-wire starting shall be by a solenoid shift, electric starter.

E. The engine fuel system shall be designed for primary operation on natural gas having a BTU content of 1000 BTU per cubic foot delivered to the unit in a vapor state. A carburetor, secondary regulator, fuel lock-off solenoid and all piping must be installed at the point of manufacturing, terminating at a single pipe opening external to the mounting base.

F. The engine shall have (a) unit mounted, thermostatically controlled water jacket heater(s) to aid in quick starting. The wattage shall be as recommended by the manufacturer. The contractor shall provide proper branch circuit from normal utility power source.

G. Sensing elements to be located on the engine for low oil pressure shutdown, high coolant temperature shutdown, low coolant level shutdown, overspeed shutdown and overcrank shutdown. These sensors are to be connected to the control panel using a wiring harness with the following features: wire number labeling on each end of the wire run for easy identification, each sensor connection shall be sealed to prevent corrosion and all wiring to be run in flexible conduit for protection from the environment and any moving objects.

H. Provide the following items installed at the factory:

1. The manufacturer shall supply a catalytic muffler and air/fuel ratio controller. The catalytic muffler must be part of the engine exhaust system and completely installed and tested at the factory.

2. The manufacturer shall supply its recommended stainless steel, flexible connector to couple the engine exhaust manifold to the exhaust system.

I. The following equipment is to be provided by the engine-generator set manufacturer and shipped loose with the unit:

- J. Engine speed shall be controlled by isochronous governor with no change in alternator frequency from no load to full load. Steady state regulation is to be 0.25%.
- K. One step load acceptance shall be 100% of engine-generator set nameplate rating and meet the requirements of NFPA 110 paragraph 7.13.7
- L. The generator system shall support generator start-up and load transfer within 10 seconds.
- M. Remote shutdown switch

2.3 ALTERNATOR: Shall have the following features:

- A. The alternator shall be a 4 pole revolving field type, 4 lead, wired for 208Y/120 volt, 3 phase, 60 hz, rated at 100 kw with a permanent magnet driven exciter. Photosensitive components will not be permitted in the rotating exciter. The stator shall be gear drive connected to the engine to ensure permanent alignment. The generator shall meet temperature rise standards for Class "H" insulation, operate within Class "F" standards for extended life. All leads must be extended into an AC connection panel. The alternator shall be protected by internal thermal overload protection and an automatic reset field circuit breaker.
- B. One step load acceptance shall be 100% of engine-generator set nameplate rating and meet the requirements of NFPA 110 paragraph 5-13.2.6. The generator set and regulator must sustain at least 300% short circuit current for 10 seconds during 3 phase fault.
- C. A NEMA 1 panel that is an integral part of the generator set must be provided to allow the installer a convenient location in which to make electrical output connections. An fully rated, isolated neutral must be included by the generator set manufacturer to insure proper sizing.
- D. The electric plant (engine and alternator) shall be mounted with internal vibration isolation onto a welded steel base. External vibration isolation shall not be required for normal pad mounted applications.
- E. Provide the following items installed at the factory:
 - 1. A main line circuit breaker carrying the UL mark shall be factory installed. The breaker shall be rated per the manufacturer's recommendations. The line side connections are to be made at the factory. Output lugs shall be provided for load side connections. A system utilizing manual reset field circuit breakers and current transformers is unacceptable.

2.4 CONTROLS:

- A. The generator control system shall be a fully integrated microprocessor based control system for standby emergency engine generators meeting all requirements of NFPA 110 level 1.
- B. The generator control system shall be a fully integrated control system enabling remote diagnostics and easy building management integration of all generator functions. The generator controller shall provide integrated and digital control over all generator functions including: engine protection, alternator protection, speed governing, voltage regulation and all related generator operations. The generator controller must also provide seamless digital integration with the engine's electronic management system if so equipped. Generator controller's that utilize separate voltage regulators and speed governors or do not provide seamless integration with the engine management system are considered less desirable.
- C. Communications shall be supported with building automation via the Modbus protocol without network cards or protocol exchangers. Optional internet and intranet connectivity shall be

available.

D. The control system shall provide an environmentally sealed design including encapsulated circuit boards and sealed automotive style plugs for all sensors and circuit board connections. The use of non-encapsulated boards, edge cards, and pc ribbon cable connections are considered unacceptable.

E. Circuit boards shall utilize surface mount technology to provide vibration durability. Circuit boards that utilize large capacitors or heat sinks must utilize encapsulation methods to securely support these components.

F. A predictive maintenance algorithm that alarms when maintenance is required. The controller shall have the capability to call out to the local servicing dealer when maintenance is required.

G. Diagnostic capabilities should include time-stamped event and alarm logs, ability to capture operational parameters during events, simultaneous monitoring of all input or output parameters, callout capabilities, support for multi-channel digital strip chart functionality and .1msec data logging capabilities.

H. The control system shall provide pre-wired customer use I/O: 4 contact inputs, 2 analog inputs, 4 relay outputs, and communications support via RS232, RS485, and an optional modem. Customer I/O shall be software configurable providing full access to all alarm, event, data logging, and shutdown functionality. In addition, custom ladder logic functionality shall be supported to provide application support flexibility. The ladder logic function shall have access to all the controller inputs and customer assignable outputs.

I. The control panel will display all user pertinent unit parameters including:

- Engine and alternator operating conditions
- Oil pressure and optional oil temperature
- Coolant temperature and level alarm
- Fuel level (where applicable)
- Engine speed
- DC battery voltage
- Run time hours
- Generator voltages, amps, frequency, kilowatts, and power factor
- Alarm Status
- Current alarm(s) condition per NFPA 110 level 1
- Alarm Log of last twenty alarm events (date and time stamped)

J. For system reliability and security concerns, access to and manipulation of the internal operating parameters and alarm limits shall be conducted via password protected PC based software by trained personnel. System configuration support shall be provided locally or remotely by the manufacturers servicing representatives.

2.5 TRANSFER SWITCH EQUIPMENT:

2.5.1 Automatic Transfer Switch Equipment:

An automatic transfer switch shall be provided by the manufacturer of the generator set. Switch shall be three pole with solid neutral, enclosed in NEMA 1 enclosure. Adjustable time delays shall be provided for engine starting, transfer with bypass switch, retransfer, and cool down. Voltage dropout and pick-up levels shall be customer adjustable. Seven day exerciser shall be provided with load/no load selector switch. Transfer switch shall be UL1008, electrically operated and mechanically held. External test switch shall be provided as well as a time delay bypass switch for test, retransfer, and cool down.

2.5.2 Project Drawings:

Refer to the project drawings for specifications on the sizes and types of transfer switch equipment, number of poles, voltage and ampere ratings and enclosures.

All transfer switches and accessories shall be UL listed and labeled, tested per UL Standard 1008, and CSA Approved.

2.5.3 Ratings:

Transfer switch shall be rated for 400 Amperes.

Main contacts shall be rated for 250 Volts AC minimum.

Transfer switches shall be rated to carry 100 percent of rated current continuously in the enclosure.

Transfer switches shall be continuously rated in ambient temperatures of -40 to +50 degrees C, relative humidity up to 95% (non-condensing), and altitudes up to 10,000 feet.

Transfer switch equipment shall have a withstand and closing rating (WCR) in RMS symmetrical amperes greater than the available fault currents shown on the drawings.

2.6 REMOTE ANNUNCIATOR PANEL:

A remote annunciator panel shall be installed as required by code and/or by the Fire Marshall.

A. The annunciator shall indicate alarm conditions of the emergency or auxiliary power source as follows:

1. Individual visual signals plus a common audible alarm shall warn of the following:

High Battery Voltage	Battery voltage too high (over charging)
Low Battery Voltage	Battery voltage too low (charger failure)
Normal Battery Voltage	Battery voltage ok
Generator Running	Generator has output voltage
Normal Utility Power	Utility power supplying the load
EPS Supplying Load	Genset supplying the load
Pre-Low Oil Pressure	Oil pressure approaching low limit
High Coolant Temp	Genset has shutdown due to high coolant temp
Low Engine Temp	Engine has malfunctioned
Overspeed	Engine has shut down due to overspeed
Overcrank	Engine failed to start
Not in Auto	Engine control switch not in AUTO position
Battery Charger	Charger is signaling a failure.
Low Fuel	Fuel level below preset minimum
Low Coolant Level	Engine coolant below minimum level
Customer Faults (3)	Customer preselected condition

B. The annunciator shall also have the following features:

1. One pushbutton momentary contact switch. Label switch "LAMP – TEST". Initiating this switch shall momentarily actuate the alarm buzzer and all the indicating lamps.
2. Audible Alarm: There shall be an audible alarm, rated for 85 dB at 10 feet, which shall become actuated whenever an alarm condition occurs. A momentary-contact acknowledge pushbutton shall silence the audible alarm, but not clear the alarm lamp. Elimination of the alarm condition shall automatically release the seal-in circuit for the audible alarm and extinguish the alarm lamp.

2.7 ADDITIONAL UNIT REQUIREMENT:

A. The following equipment is to be installed at the engine-generator set manufacturer's facility:

1. Weather protective sound attenuated, level 2 enclosure: The engine-generator set shall be factory enclosed in a heavy gauge steel enclosure constructed with 14 gauge corner posts, uprights and headers. The roof shall be made of aluminum, aid in the runoff of water and include a drip edge. The enclosure shall be coated with electrostatically applied powder paint, baked and finished to manufacturers specifications. The color will be tan-standard. The enclosure is to have large, hinged doors to allow access to the engine, alternator and control panel. The doors must lift off without the use of tools. Each door will have lockable hardware with identical keys. Padlocks do not meet this specification.

The exhaust silencer(s) shall be provided of the size as recommended by the manufacturer and shall be of critical grade. The silencer(s) shall be mounted within the weather protective enclosure for reduced exhaust noise and provide a clean, smooth exterior design. It shall be connected to the engine with a flexible, seamless, stainless steel exhaust connection. A rain cap will terminate the exhaust pipe. All components must be properly sized to assure operation without excessive back pressure when installed.

2. A heavy duty, lead acid 12vdc battery set rated at 925 CCA, BCI group 8D shall be installed by the generator set manufacturer. Provide all intercell and connecting battery cables as required.

3. Provide an automatic dual rate battery charger. The automatic equalizer system shall monitor and limit the charge current to 20 amps. The output voltage is to be determined by the charge current rate. The charger must be protected against a reverse polarity connection. The battery charger is to be factory installed on the generator set. Due to line voltage drop concerns, a battery charger mounted in the transfer switch will be unacceptable.

B. The following equipment is to be provided by the engine-generator set manufacturer and shipped loose with the unit:

1. Pad type vibration isolators to mount between the mounting base and pad to reduce noise and transmitted vibrations shall be supplied by the manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Mounting:

1. Support the base of engine-generator set on vibration isolators, each isolator bolted to the floor (pad), base bolted to isolator.
2. Install sufficient number of isolators so that the floor (pad) bearing pressure under each isolator is within the floor (pad) loading specification.
3. Install equal number of isolators on each side of the engine-generator set's base.
4. Locate isolators for approximately equal load distribution and deflection per isolator. Drill the base of the engine-generator set at the factory for the isolator bolts.
5. Isolators shall be shipped loose with the engine-generator set.
6. All connections between the engine-generator set and exterior systems (such as fuel lines electrical connections, engine exhaust system and air exhaust shroud) shall be flexible.
7. Each isolator shall be the spring type with a neoprene acoustical friction pad, a minimum of 1/4-inch thick.
8. Each isolator shall be adjustable for leveling and load distribution.

9. The isolators shall be constrained with restraints capable of withstanding static forces in any direction equal to twice the weight of the supported equipment.
- B. Balance:
1. The peak-to-peak amplitude of vibration velocity in the horizontal, vertical and axial directions shall not exceed 0.65 inch per second at main structural components such as the engine block of the generator frame at the bearings.
 2. Balance the engine-generator set statically and dynamically at the factory in order to comply with the maximum specified vibration velocity.
- C. Connect all components of the engine generator power system so that they will continue to be energized by the auxiliary electrical power system during failures of the normal electrical power supply system.
- D. Control and Signal Systems: Furnish, install and connect conduits and wiring devices for complete fully operational control and signal systems. Include interconnections between local control cubicles, remote annunciator panels, remote derangement panels, remote monitoring panels, remote exercising panels and underground fuel storage tanks.

3.2 TECHNICAL SERVICES DURING INSTALLATION AND TEST:

- A. At the construction site, provide the services of a competent, factory-trained engineer or technician employed by the manufacturer of the engine-generator set to technically supervise and participate during all of the adjustments and tests for the set and major auxiliaries. Perform a full load test with a resistive bank, provided by the contractor, for two hours. Adjustments and test shall be made in the presence of the Architect.

3.3 INSTRUCTIONS AND FINAL INSPECTIONS:

- A. Laminate or mount under plexiglas a set of operating instructions for the system and install instructions within a frame mounted on the wall near the engine-generator set as requested by the owner.
- B. At the final inspection in the presence of a the Owner's representative, demonstrate that the complete auxiliary electrical power system operates properly in every respect.
- C. Furnish the services of a competent, factory-trained engineer or technician for five, 4-hour periods for instruction personnel in operation and maintenance of the equipment, on the dates requested by the owner.

3.4 WARRANTY:

A. The standby electric generating system components, complete engine-generator and instrumentation panel shall be warranted by the manufacturer against defective materials and factory workmanship for a period of 24 months. Such defective parts shall be repaired or replaced at the manufacturer's option, free of charge. Travel and labor shall be included for the first 12 months.

The warranty period shall commence when the standby power system is first placed into service. Multiple warranties for individual components (engine, alternator, controls, etc.) will not be acceptable. Satisfactory warranty documents must be provided. Also, in the judgment of the specifying authority, the manufacturer supplying the warranty for the complete system must have the necessary financial strength and technical expertise with all components supplied to provide adequate warranty support.

END OF SECTION

SECTION 26 43 13 - SURGE PROTECTIVE DEVICES**PART 1 - GENERAL****1.1 SECTION INCLUDES:**

- A. Surge Protective Devices (SPDs) integrated into electrical distribution equipment.

1.2 RELATED SECTIONS:

- A. 26 20 00 Low Voltage Electrical Transmission

1.3 REFERENCE STANDARDS:

The equipment and components in this specification shall be designed and manufactured according to latest revision of the following standards (unless otherwise noted).

- A. ANSI/IEEE C62.41.1-2002, Guide on the Surge Environment in Low Voltage AC Power Circuits.
- B. ANSI/IEEE C62.41.2-2002, Recommended Practice on Characterization of Surges in Low Voltage AC Power Circuits.
- C. ANSI/IEEE C62.45-2002, Recommended Practice on Surge Testing for Equipment Connected to Low Voltage AC Power Circuits.
- D. IEEE C62.62-2000, Test Specifications for Surge Protective Devices for Low Voltage AC Power Circuits.
- E. Military Standard 220B, 24 January 2000 Release. Method of Insertion Loss Measurement
- F. UL 1449, Third Edition – Surge Protective Devices
- G. UL 1283, Electromagnetic Interference Filters
- H. UL 67, Panelboards
- I. UL 891, Dead-Front Switchboards
- J. UL 96A Lightning Protection Systems
- K. NEMA LS-1 (1992), Low Voltage Surge Protective Devices
- L. NFPA 70 National Electrical Code – Article 285

1.4 DEFINITIONS:**1.5 SYSTEM DESCRIPTION:**

- A. SPDs shall be applied at Service Entrance and Secondary Electrical Panels as indicated on drawings.

1.6 SUBMITTALS: <S>

- A. Manufacturer shall provide 3 copies of the following documents to owner for review and evaluation in accordance with general requirements of Division 01 and Division 26:
 - 1. Product Data on specified product:
 - a. Maximum Single Impulse Surge Current Rating
 - b. Surge Life (Repetitive Surge) Rating
 - c. UL1449 Third Edition Voltage Protection Ratings (VPR)
 - d. UL1449 Third Edition Nominal Discharge Current (In)
 - 2. Upon request, provide copies of third party lab test reports for Maximum Sing Impulse Surge Current Rating and Surge Life Rating.

1.7 INSTALLATION, OPERATION, AND MAINTENANCE DATA:

- A. Manufacturer shall provide 3 copies of the following documents to owner for review and evaluation in accordance with general requirements of Division 01 and Division 26.

1.8 QUALITY ASSURANCE (QUALIFICATIONS):

- A. Manufacturer shall have specialized in the manufacture and assembly of surge suppression systems for 15 years.
- B. SPDs shall be Listed by Underwriters Laboratories in accordance with the applicable standards found in Section 1.03 of this specification. UL Type 4 assemblies are allowed, provided they have been investigated by UL for Type 1 or Type 2 Locations and are approved as suitable for use within the specified electrical panel or gear. SPDs shall not require additional UL testing or field investigation to maintain the equipment's UL listing.

1.9 DELIVERY, STORAGE, AND HANDLING:

- A. Contractor shall store, protect, and handle products in accordance with recommended practices listed in manufacturer's Installation and Maintenance Manuals.
- B. Contractor shall inspect and report concealed damage to carrier within 48 hours.
- C. Contractor shall store in a clean, dry space. Cover with heavy canvas or plastic to keep out dirt, water, construction debris, and traffic. Heat enclosures to prevent condensation.
- D. Contractor shall handle in accordance with manufacturer's recommendations to avoid damaging equipment, installed devices, and finish.

1.10 PROJECT CONDITIONS (SITE ENVIRONMENTAL CONDITIONS):

- A. Follow (standards) service conditions before, during and after switchboard installation.
- B. The equipment containing SPDs shall be located in well ventilated areas, free from excess humidity, dust and dirt and away from hazardous materials. Ambient temperature of area immediately surrounding the SPD shall be between minus 40 and plus 65 degrees C. Indoor locations shall be protected to prevent moisture from entering enclosure.
- C. Operating frequency: 50 or 60 Hz

- D. Humidity: 95 percent relative humidity, non-condensing
- E. Operating Altitude: 0 – 12,000 ft

1.11 WARRANTY:

- A. Manufacturer warrants equipment to be free from defects in materials and workmanship for 5 years from date of purchase.

PART 2 – PRODUCTS <S>

2.1 MANUFACTURER:

- A. General Electric Company's protection products have been used as the basis for design. Other manufacturers' products of equivalent quality, dimensions and operating features may be acceptable, at the Engineer's discretion; if they comply with all requirements specified or indicated in these Contract documents. The SPD and Distribution Equipment shall be manufactured by the same company.

2.2 MANUFACTURED ASSEMBLIES:

- A. Furnish General Electric Tranquell Series SPDs as indicated in drawings.

2.3 COMPONENTS:

Refer to Drawings for: actual layout and location of equipment and components; current ratings of devices, bus bars, and components; voltage ratings of devices, components and assemblies; and other required details.

- A. Electrical Requirements
 1. Maximum Single Impulse Surge Current Rating
 - a. Shall be based on the testing of a complete SPD including fuses and all components that make up the SPD assembly using an IEEE C62.41, 8x20us current wave applied at the maximum, per mode rated value of the SPD. Devices that derive a per mode rating by adding test results of individual components are not acceptable.
 2. Surge Life Rating
 - a. Shall be determined by the application of an 8x20us, 10kA short circuit Category C High test waveform across the SPD as defined by ANSI/IEEE C62.41.2-2002. The test wave shall be injected at one-minute intervals until the conclusion of the test or device failure. A failure is defined as either performance degradation or more than 10% deviation of clamping voltage at the specified surge current.
 3. Surge Current Ratings shall be as follows:
 - a. Service Entrance Locations
 - 1) Maximum Single Impulse Surge Current Rating: 200kA per mode.
 - 2) UL 1449 Nominal Discharge Current Rating (In): 20kA
 - 3) Minimum Surge Life Rating: 20,000 IEEE C62.41 C-High (C3) impulses

- b. Branch and Lighting Panels
 - 1) Maximum Single Impulse Surge Current Rating: 65 kA per mode.
 - 2) UL 1449 Nominal Discharge Current Rating (In): 20kA
 - 3) Minimum Surge Life Rating: 5,000 IEEE C62.41 C-High (C3) impulses
- 4. The UL assigned Voltage Protection Rating (VPR) shall be tested in accordance with UL 1449, 3rd Edition. Where an integral disconnect is provided, the VPR shall be determined with the integral disconnect included. The VPR rating shall not exceed the values of the following tables.
 - a. UL 1449 3rd Edition Voltage Protection Ratings (VPR) with integral disconnect.

SPD Voltage Rating	System Configuration	L-N	N-G	L-G	L-L
120/208-240	WYE (or) Single-Split Phase	900	900	900	1200
277/480	WYE	900	900	900	1200
347/600	WYE	1500	1500	1500	2000
240	Delta	1500	1500	1500	3000
480	Delta			1500	2000

- b. UL 1449 3rd Edition Voltage Protection Ratings (VPR) with integral disconnect.

SPD Voltage Rating	System Configuration	L-N	N-G	L-G	L-L
120/208-240	WYE (or) Single-Split Phase	700	700	700	1200
277/480	WYE	700	700	700	1200
347/600	WYE	1200	1200	1200	2000
240	Delta	1500	1500	1500	3000
480	Delta			900	1800

- B. SPD Emission Ratings
 - 1. Audible Noise: No Audible Noise
 - 2. Surface Temperature: less than 55°C
- C. General Performance and Design Requirements
 - 1. SPD shall be UL witness tested to a fault current rating equal to or greater than the fault current rating of the distribution equipment. The SPD short-circuit current (SCCR) rating shall be marked on the SPD in accordance with the requirements of UL 1449 and NEC Article 285.
 - 2. The use of smaller, electronic grade (<40mm) MOVs is not acceptable. SPDs that use gas tubes, silicon avalanche diodes or selenium rectifiers or combinations of these components along with MOVs are not acceptable.
 - 3. SPDs shall provide protection in each of the following modes: L-N, L-G, N-G, and L-L for WYE Systems. L-G and L-L for Delta Systems.

4. The Maximum Continuous Operating Voltage (MCOV) for all voltage configurations shall be at least 115% of nominal on 480/277 volt systems and 125% of nominal on 240-208/120 volt systems.
 5. EMI/RFI Noise Suppression: -50 dB attenuation at 100 kHz, tested per MIL-STD 220B.
 6. The SPD fusing system shall be capable of allowing the rated Maximum Single Impulse Surge Current to pass without premature fuse operation. SPDs utilizing a fusing system that opens at or below the Maximum Single Impulse Surge Current rating are unacceptable.
 7. SPDs shall include integral fusing for each suppression component. Designs that rely solely on an electrical panel's main breaker to interrupt fault currents resulting from a shorted suppression component are not allowed.
 8. The use of plug-in type suppression modules is not allowed.
 9. SPDs installed in main switchgear, switchboards, or other service entrance locations shall have an integral non-fused disconnect, independently tested to the maximum surge current rating of the device. SPDs installed in distribution or branch panel locations shall be either direct connected to the main bus or via a dedicated branch breaker.
- D. Standard Monitoring Features
1. Green LED operational status indicator per each protected phase.
 2. Audible alarm with Red LED alarm status indicator and test / silence switch, enabled via a front panel pushbutton switch.
 3. Dry contacts for remote monitoring purposes, 1NO & 1NC contact. Change in state indicated on MOV failure.
 4. Six-Digit Digital Surge Event Counter with battery backup.
- E. SPDs shall be factory-mounted integral to the electrical distribution equipment and shall not violate the equipment manufacturer's UL label.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL:

- A. Verify in the field that all factory made connections and terminations are torqued to manufacturer's recommended tolerances. Also, all field-made connections shall be torqued to manufacturer's recommendations using calibrated torqueing tools.

3.2 CLEANING AND ADJUSTMENT:

- A. After completion, clean the interior and exterior of dirt, paint and construction debris.
- B. Touch up paint all scratched or marred surfaces with factory furnished touch-up paint of the same color as the factory applied paint.

- C. Adjust and align panelboard interior and trim in accordance with manufacturer's recommendations, and to eliminate gaps between the two.

END OF SECTION

SECTION 26 50 00 - LIGHTING

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section includes interior luminaires, lamps, ballasts, and accessories.

1.2 SUBMITTALS:

- A. Product Data: Submit dimensions, ratings, and performance data.

PART 2 – PRODUCTS

2.1 LIGHTING FIXTURES AND LAMPS: <S>

- 2.1.1 Provide fixtures including interior and exterior fixtures and emergency type fixtures as indicated on the plans by cross-hatching and described in the schedule.
- 2.1.2 All battery packs supplying emergency lighting fixtures shall be capable of sustained operation for at least 90 minutes without any degradation in performance and without going into deep cell discharge. Provide submittal data for each battery pack/fixture application.
 - A. When the fixture is powered by the battery pack, at least one third of the normal light output shall be available for emergency lighting.
 - B. All emergency lights shall have a lighted push-to-test button clearly visible and accessible. Remote battery packs shall be provided with a remote lighted push-to-test button to be located as directed by the architect.
 - C. All battery packs shall be NICAD unless noted otherwise on the plans.
- 2.1.3 Fixtures shall be complete with lamps as indicated, ballasts, internal wiring, brackets, fittings, lenses, louvers, guards, reflectors, pole supports and accessories as required, indicated or detailed.

2.2 LED LIGHTING: <S>

- A. Lighting fixtures with LED light sources shall meet the following fixture and light source requirements:
 1. LED Color Temperature – Interior 4000K, exterior 4000K, CRI > 70
 2. Line Voltage – Universal Voltage 120-277 volts: See plans for exact voltage.
 3. Governmental Standards – LM79 and LM80 Compliant
 4. Expected Lamp Life – LED Life Rating (L70 B10) to be 60,000 hours to 100,000 hours; Defined as time of operation (in hours) to 30% lumen depreciation (i.e. 70% lumen maintenance), derived from Luminaire in-situ temperature measurement testing (i.e. LED chip package temperature (TS) measurement obtained with the LED chip package operating in given luminaire and in a given stabilized ambient environment) under UL1598 environments and directly correlated to LED package manufacturers IESNA LM-80-08 data. Predicted (L70 B10) Limits (@ 25°C luminaire ambient operating environment): Greater than 60,000 hours @ 350mA Drive Current

5. Driver – Components must be fully encased in potting material for moisture resistance, and must comply with IEC and FCC standards
 6. Surge Protection – Surge protection must be provided including separate surge protection built into electronic driver.
- B. Mechanical – Luminaire LED system components to be low copper aluminum, with high performance heat sink(s) designed specifically for LED luminaires. No active cooling features (Fans, etc.). Luminaire configuration must allow for modular upgradability and/or field repair of all electrical components (i.e. LED modules, Driver(s), etc.). Drivers and vertical light bars must be all mounted to a twist-lock tool-less assembly for ease of installation and trouble-shooting.

PART 3 - EXECUTION

3.1 INSTALLATION:

- 3.1.1 Install suspended luminaires using pendants supported from swivel hangers.
- 3.1.2 Locate recessed ceiling luminaires as indicated on Drawings and reflected ceiling plan.
- 3.1.3 Install surface mounted ceiling luminaires plumb and adjust to align with building lines and with each other. Secure to prevent movement.
- 3.1.4 Install concrete bases in accordance with Section 03 30 00 for lighting poles at locations as indicated on Drawings.
- 3.1.5 Install poles plumb.
- 3.1.6 Provide emergency egress lighting as required by NFPA 101. Provide point by point footcandle plots (2'-0" X 2'-0" grid pattern) with lighting fixture shop drawing submittal of all means of egress indicating required levels have been provided. Provide (10) spare emergency battery packs (1400 lumen minimum) for installation as directed by Architect or authority having jurisdiction.
<S>
- 3.1.7 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, at each corner of fixture.
- 3.1.8 Any fixture damaged during construction prior to final acceptance of the project shall be replaced or repaired to the satisfaction of the Architect.
- 3.1.9 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.
- 3.1.10 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.
- 3.1.11 Fixtures exposed to outdoor temperatures shall be rated for 0 degree Fahrenheit operation.

- 3.1.12 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.
- 3.1.13 Provide 10% minimum of each type of exit light fixture along with extra materials and labor for installation as directed by architect, engineer, or fire marshal.

3.2 ADJUSTING:

- 3.2.1 Aim and adjust luminaires.
- 3.2.2 Relamp luminaires, lighting units, and exit signs with failed lamps at Substantial Completion.

END OF SECTION

**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), voice evacuation, 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

2.1 MAIN FIRE ALARM CONTROL PANEL:

- A. The FACP shall be a non-proprietary, Fire-Lite Model ES-200 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 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 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 compliance 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 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 panel's 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. 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.
 - b. Speaker circuit shall be capable of either Class A or B wiring.
 - c. 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.
 - d. Built in alert tone generators with steady, slow whoop, high/low and chime tone field programmable.
 - e. 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 the 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 deactivate upon depression of the Signal Silence switch.
12. Non-Alarm 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 Thermal Detectors
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.
 3. Duct Detectors shall be installed in HVAC equipment, smoke dampers, fire/smoke dampers, etc. as required by building codes.
- 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. Addressable devices which use a binary-coded address setting method, such as a DIP switch, are not an allowable substitute.
 2. Detectors shall be addressable and intelligent, and shall connect with two wires to the fire alarm control panel signaling line circuits.
 3. 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.
 4. 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.
 5. 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.
 6. Detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel.
 7. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (ION, PHOTO, THERMAL).
 8. 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, 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:

- (2) manual pull stations
- (2) smoke detectors
- (2) duct detectors
- (4) speaker/visual signals (110 candelas, 95 dB minimum)
- (4) visual signals (110 candelas)

All air handlers shall be shut down. 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 training 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 owner three (3) complete manuals 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, and NFPA 72 form, system record of completion.

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

**SECTION 27 13 43
DATA, TELEPHONE, INTERCOM CABLING**

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS:

The requirements of the Contract Documents, including the General and Supplementary General Condition and Division 1 - General Requirements shall apply to the work of this section.

7 days prior to bid, all exceptions taken to these Specifications, all variances from these Specification and all substitutions of operating capabilities or equipment called for in these Specification shall be listed in writing and forwarded to the Engineer. Any such exception, variances or substitutions not listed at the time of bid in the specification and or addenda and are identified in the submittal, shall be immediately stamped disapproved without comment.

1.2 GENERAL SCOPE:

Work of this Section shall be in accordance with the intent of the Contract Documents and shall include the following principal items:

Data Equipment and Wiring Installation
Telephone Wiring Installation
Intercom Wiring Installation

1.2.1 Scope

The work covered by this Section of the Specification shall include all labor, equipment, materials and services to furnish and install complete Data, Telephone, and Intercom Wiring System.

1.3 REFERENCED STANDARDS:

NFPA 70 - National Electrical Code
TIA/EIA 568B
Americans with Disabilities Act - Accessibility Guidelines for Building and Facilities
(ADA-AG)

1.4 CONTRACTOR QUALIFICATIONS:

The contractor shall be the authorized factory distributor of the products submitted. The contractor shall have the proper Telecommunications license as required by the State of Louisiana. The company shall employ trained installers. A copy of the training certificates shall also be supplied to the engineer for verification.

1.5 WARRANTY:

Manufacturer shall guarantee the system equipment for a period of one (1) year from date of final acceptance of the system. The contractor shall guarantee all wiring and raceways to be free from inherent mechanical or electrical defects for one (1) year from date of final acceptance of the system.

PART 2 – PRODUCTS <S><OM>

2.1 DATA, TELEPHONE, AND INTERCOM WIRING SYSTEM: <S> <OM>

- a) This Section includes the wire, cable, outlet assemblies, installation, and testing for wiring systems to be used as signals pathways for high-speed data, telephone transmission.

- b) The contractor shall be certified by the manufacturer to install that manufacturer's products. The installer shall certify by letter that the installation complies with the manufacturer's recommendations and the requirements of TIA/EIA 568B. The name and qualifications of the installer shall be submitted and approved prior to beginning the installation of data systems products.
- c) Provide products specified in this section that are listed and labeled per UL and meets NFPA.
- d) Submittals shall include Product Data for each component specified, including detailed manufacturer's specifications. Include data on features, rating, and performance. Telecommunications contracting company qualification data shall be submitted for approval and shall include documentation verifying qualifications.
- e) Use the following number products or the later generation upgrade of the models where appropriate meeting the project requirements (as determined by the Engineer, where there is question, request clarification prior to last addenda). Subject to compliance with requirements, provide products by one of the following:

Category 6, Unshielded Twisted Pair Data Cable (600 MHZ Minimum) Reel-In-Box (Plenum):

ICC: ICCABP6VXX

Panduit: pup6004X

2-Port Faceplate (stainless steel):

ICC: IC107SF2SS

Panduit: CFPL2WHY

4-Port Faceplate (stainless steel):

ICC: IC107SF4SS

Panduit: CFPL4WHY

Category 6, 24-Port Patch Panels:

ICC: IC107BP242

Panduit: CPPL24WBLYY

Category 6, 48-Port Patch Panels:

ICC: IC107BP482

Panduit: CPPL48WBLYY

Category 6, Modular Jack

Panduit: CJ688TGX

Category 5, Modular Jack

Panduit: cjse88Tiw

Fiber Optic Cable, 6-Strand Multimode (Plenum):

AMP

CORINING

Fiber Optic, 24-Port Pre-Loaded Rack-Mount, Drawer-Style Enclosure:

ICC

Panduit

4-Post 19" Open Frame Rack (30" depth)

ICC: ICCMSR1984

Panduit: R4P

Category 5, 25-pair, Unshielded, Twisted pair telephone cable:

ICC: ICCABP5EXX
 Panduit: PUP5504X

Velcro tie (0.75" w.x 12.00" 1. Min.) and Saddle:

Panduit #HLS3S-XO/TMEH-S8-QO
 Nordex/CDT #AX100784/#AX100781

SPEAKERS:

2x2 Layin IP Ceiling Speaker (Talkback):

Valcom: VIP-422A
 Bogen

Wall IP Speaker:

Valcom: VIP-430A-VB-A13
 Bogen

Outdoor IP Speaker with protective wire cage:

Valcom: VIP-130AL – V-WGHORN
 Bogen

NOTE: CONTRACTOR SHALL INCLUDE FIVE ADDITIONAL SPEAKERS OF EACH TYPE IN BID.

f) Coordinate the feature of materials and equipment so they form an integrated system. Match components and interconnections for optimum performance.

g) TWISTED PAIR CABLES, CONNECTORS, AND TERMINAL EQUIPMENT SHALL BE AS FOLLOWS:

1) Listed as Complying with Category 6: Provide evidence of listing for all products specified in this Article.

2) Unshielded Twisted Pair (UTP) Cable: Meets or exceeds TIA/EIA 568B requirements for Category 6. Multipair No. 24 AWG, color-coded, thermoplastic- insulated conductors in a polyvinyl chloride (PVC) jacket. Wiring shall be solid copper.

3) Jacks and Jacks Assemblies for UTP Cable: Modular, color-coded, RJ-45 receptacle units with integral IDC-type terminals. Non-keyed, thermoplastic face, T568B wiring. Independently verified to exceed TIA/EIA 568B requirements for category 6.

4) Workstation Outlets: mounting strap for four jacks maximum in duplex receptacle configuration flush to exterior surface of faceplate. Provide blank filler for unused ports. Device shall be ivory plastic. Device plate is to be 302 stainless steel. Mount in surface raceway box unless specifically noted, flush.

5) Category 6, 48-port and 24-Port Patch Panels are to be pass-through with RJ-45 jacks in front and back of the indication strip. Unit shall be for 19" rack mounting and 1.75" high and shall be Category 6 compliant. Patch cables shall be provided by Owner.

Operating Wavelength (Nanometers)	Minimum Bandwidth (MHz-km)	Max.Attenuation (dB/km)
850	400	3.0
1300	400	1.0

6) Fiber Optic Cable, 6-strand, Tight Buffer, Distribution Type is to be six separate glass fibers of 62.5/12.5 micron (core/cladding) construction with tight buffer construction in the overall PVC jacket. The minimum optic characteristics shall be the same as the fiber optic outdoor cable above.

7) Fiber Optic Cable Connector, Type St, Simplex, Multimode is to be ST type connector & shall have ferrule.

8) Fiber Optic, 24-Port, Rack Mount, Drawer-Style Enclosure is to be steel housing, preloaded with 24 ST style couplings in slide out drawer with fiber optic storage drums and brackets and 19-inch rack mounting. Unit shall occupy one rack unit of mounting space.

9) FIBER AND CAT 6 IDENTIFICATION: Identify system components and cables as per details on project drawings. Workstations outlets shall have cables labeled within outlet boxes and each jack at outlets. IDF & MDF Cabinets shall have labels on or over each jack and at patch panels. Cables in any location shall be labeled on each cable within 4 inches (100mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated. Wiring cable labels are to be self-adhesive vinyl or vinyl-cloth wrap-around tape markers, machine printed with alphanumeric cable designations.

10) IDF Racks are to have Legend Plates of engraved plastic laminate, bakelite identification sign, minimum ½" high letters, for each utility cabinet, screwed or epoxyed to top of rack.

11) Cables for Data Service shall be unshielded twisted pair cable conforming to category 6 of TIA/EIA-568B, for runs between IDF's and workstation outlets,

12) Cat 6 cable Installation: All installation, labeling and testing shall be performed as per TIA/EIA-568B. Install cable without damaging conductors, glass fibers, or jackets. Do not bend cable in handling or installation to smaller radii than minimums recommended by manufacturers. Pull cables without exceeding cable manufacturers recommended pulling tensions. Pull cables simultaneously where more than one is being installed in the same raceway. Use pulling compound or lubricant where necessary. Use compounds that will not affect the conductor or insulation. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage media or raceway. Separation of wires shall comply with TIA/EIA-569 rules for separation of unshielded copper voice data and system cables for potential EMI sources, including electrical power lines and equipment. Splices will not be permitted.

PART 3 - EXECUTION

- a) Termination, testing and documentation for all cabling shall be performed by Electrical Contractor's installer that has at least five (5) years experience performing similar work, with the state of Louisiana State contractor licensee in telecommunications. Fiber optic cable shall be terminated per manufacturer's recommendations. Prepare fiber optic cable strands for termination as per cable and the connector manufacturers' instructions. Take care not to kink or damage the individual fiber strands. Carefully clean each fiber strand to prevent misalignment.
- b) Provide a NETWORK CABLE RECORD for each IDF listing each network cable and a DISTRIBUTION CABLE RECORD listing each distribution cable each facility. At each new IDF, provide a NETWORK CABLE RECORD bound in plastic report cover with double with double-hang fasteners and with pages in individual plastic sleeves. At each MDF, provide a DISTRIBUTION CABLE RECORD and a copy of the NETWORK CABLE RECORD for each

- IDF in a three ring binder and with pages in individual sleeves A duplicate copy of the MDF file shall be provided for SUSLA's records.
- c) Draft copies of the cable records will be maintained at the MDF and each IDF until replaced by final printed documents.
 - d) The label given each existing and each new jack shall be clearly marked on the set of record drawings. Each outlet shall be represented by a rectangle within which the label for each jack in each outlet shall be written and a line shall be marked connecting the rectangle to the outlet symbol, if shown, or outlet location if not shown. Contractor is permitted to adhere jack labels on the record drawings with a line drawn to the appropriate outlet in lieu of writing each jack number.
 - e) Testing: Upon installation of cable and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance. Remove temporary connections when tests have satisfactorily completed.
 - 1) Copper Cables shall be inspected for physical damage and each cable signal path shall be tested for continuity and shorts. Use time-domain reflectometer with strip chart recording capability and anomaly resolution to within 12 inches (300mm) in runs up to 1000 feet (300m) in length. Test for faulty connectors, splices, and terminators. Link performance for UTP cables must meet minimum criteria for TIA/EIA-568B. Test shall be done as per TIA/EIA-568B.
 - 2) Fiber Optic Cables shall be given visual inspection for mechanical damage and optical test to verify performance, The optical tests shall conform to TIA/EIA-568B: Optical Power Loss Measurements of Installed Multimode Fiber Cable Plant.
 - g) Correct malfunctioning units and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.
 - h) Work shall be performed in first class, craftsman-like fashion. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION

SECTION 33 10 00: UTILITY SERVICES**PART 1 - GENERAL****1.1 GENERAL:**

Refer to Section 22 05 00 for General Provisions.

1.2 SCOPE:

The Plumbing Subcontractor shall extend the sanitary sewer service. The scope of this work shall include all labor and materials required for the installation of the various utility services as herein specified, adhering to the general routing and methods of distribution as shown by the drawings.

1.3 SUBMITTALS:

Submittal of pipe and fittings is not required unless a deviation from the specification is proposed.

PART 2 - PRODUCTS**2.1 SANITARY SEWER SERVICE:**

The sanitary sewer service shall be cast iron soil pipe exactly as specified under Section 22 05 03 for sanitary sewer pipes and shall extend from the buildings to the point of connection shown on the drawings. At the Contractor's option and where approved by local code authority, Type DWV Schedule 40 PVC pipe and fittings may be used when installed in accordance with ASTM D2321.

PART 3 - EXECUTION**3.1 FABRICATION AND INSTALLATION:**

All underground service lines shall be located to have a minimum cover of not less than thirty-six inches (36"). If it is impossible to maintain this specified cover due to new or existing grades, floor elevations, curb elevations, etc., the Contractor shall contact the Architect for instructions prior to installation of any pipe so affected.

END OF SECTION

SECTION 32 12 16 - ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 SCOPE OF WORK (FULL REPAIR, MILLING AND FULL OVERLAY)

- A. The contractor shall mill & repair all failures prior to overlaying the existing asphalt parking lot as indicated on the plans. See Site Plans Parking Lots indicated to be re-paved.
- B. Contractor shall prepare the parking lots to be overlaid with two inches of new asphalt.
- C. The contractor shall ensure that all new asphalt is sloped to ensure that all water will reach the existing parking lot drainage or new drain boxes where indicated. Coordinate with General Contractor and make adjustments in grades as necessary to provide positive drainage toward drain boxes.
- D. The contractor shall complete a two inch thick asphalt overlay of the entire parking lots after milling to a depth required. Upon completion of the asphalt overlay the contractor shall install any sealants that are necessary.
- E. The contractor shall then sweep in preparation for the new parking lot striping by Section 09 90 00. The striping shall follow the same pattern as the existing striping unless indicated differently on drawings. Confirm paint direction & markings with Architect 14 days prior to installation.
- F. **Coordinate Work with other trades and do not overlay until all utility work is installed under existing parking lot.** Do not overlay until Contractor Setup Area is no longer needed.

1.3 DAMAGES TO FACILITIES

The Contractor shall be responsible for all damage to the existing paving, site, facilities and utilities that is caused by this project. The contractor shall carefully document existing site conditions and existing damages prior to commencing work. The contractor shall repair all damage prior to overlaying with new asphalt.

1.4 VERIFY EXISTING CONDITIONS

The Contractor shall be responsible for verifying all existing conditions and all dimensions / measurements prior to Bids. The information when provided in the bid documents is for general informational purposes only. The contractor shall field verify all existing visible conditions and dimensions prior to submitting a bid.

1.5 QUALIFICATIONS

Contractor shall provide a case history of completed construction contracts with Louisiana Department of Transportation.

1.6 GUARANTEE

Furnish to the Owner a one-year performance and material warranty. Contractor shall be responsible for verifying all existing conditions and all dimensions / measurements.

1.7 QUALITY CONTROL

- A. All materials and installation shall comply with Louisiana Department of Transportation and Development (LADOTD), latest edition and Section 02 30 00 – Subsurface Exploration Report.
- B. Compaction Testing of subgrade and aggregate shall be performed in accordance with LADOTD requirements and Section 01 40 00
- C. The Owner may secure a third party testing laboratory to perform test as to the quality of this work and materials. Any unsatisfactory work or materials shall be removed and replaced at no cost to the Owner. Any testing, above the minimum testing required shall be paid for by the Owner, unless the test indicate that substandard material or work is present. Then the cost shall be borne by the Contractor.

- D. Asphaltic Concrete Testing: If requested, a minimum of two asphaltic concrete cores shall be taken for each street less than 500 ft in length. An additional core shall be taken for each additional 500 ft in length or portion thereof. Asphaltic concrete paving shall have a minimum compacted relative density of 95%. Any paving found to have a density less than 95% shall be removed and replaced at no cost to the Owner.

1.8 SPECIAL CONDITIONS.

- A. The existing parking lot may be used for Contractor Set up Area and damage is anticipated prior to completion of the project. Allow for an inspection by the User Agency & Architect to mark required patching and application of bushing material prior to repair and overlay.
- B. The parking areas shall be striped with traffic marking paint by Section 09 90 00. The existing curbs shall be cleaned, prepped, and painted with a traffic rated striping painted with traffic marking paint with the existing color scheme.
- C. Any debris from the site shall be disposed of in a manner consistent with all local, state, and federal regulations.
- D. The Contractor prior to beginning work shall have the utilities located by Louisiana One Call. Any apparent interference with the proposed work shall be reported to the designated Owners Representative.
- F. Weather Limitations: Bituminous material shall be applied only when the existing surface is dry and the atmospheric temperature is above 60 deg. No material shall be applied when rain is forecast or when dust or sand is blowing.

1.9 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

1.10 SUBMITTALS

Samples of the bituminous materials that the Contractor proposes to use, together with a statement as to their source & character, shall be submitted and approved obtained before use of such materials begins. Prior to overlay work, Contractor shall submit to Architect the proposed Asphalt Design Mix sealed by a Louisiana Licensed Civil Engineer.

PART 2 - PRODUCTS

2.1 GENERAL

All products shall comply with LADOTD, latest edition.

- 2.2 The Contractor shall furnish all supervision, labor, tools, equipment, and expertise necessary for the construction as shown on the drawings, in the specifications, and the documents referenced herein for the development of the subdivision. The Owner will provide no materials, equipment, or supplies necessary to complete this project.

- 2.3 The Contractor will be responsible for the purchase, delivery, and unloading of all material necessary to complete this project.

- 2.4 REFERENCE SPECIFICATIONS AND STANDARDS: Current editions and revisions of the following specifications and standards will apply unless specifically noted otherwise. Louisiana Standard Specification for Roads and Bridge, Latest Edition. Sections of this specification will be referred to as "Section XX.XX of the Standard Specification. ASTM A615 Specifications for Deformed and Plain Billet Steel Bars for Concrete

Reinforcement including Supplementary Requirements. ASTM A185 Specification for Welded Steel Wire Fabric for Concrete Reinforcement.

2.5 MATERIALS

- A. Base Course Material shall be sand, clay, gravel in accordance with the Standard Specification, Sections 301 and 1003.
- B. Asphaltic pavement shall consist of Type 3 asphaltic wearing course in accord with Sections 501, 1002 and 1003 of the Standard Specifications.
- C. Portland Cement Materials shall be in accord with Sections 901 and 1001 of the Standard Specifications.
- D. Fine and coarse aggregates shall be in accord with the Section 1003 of the Standard Specifications. Course aggregate for concrete shall be Grade B.
- E. Asphalt tack and prime coats shall be in accord with the following; Tack Coat RC-70 503.02, 1002 Prime Coat MC-70 503.02, 1002
- F. Reinforcing steel shall conform to ASTM A615 (Grade 60) including Supplementary Reqmt. (S1).
- G. Welded wire mesh shall conform to ASTM A185 unless otherwise noted.
- H. Preformed expansion joint filler shall meet the requirements of ASTM D994 (Bituminous type) and shall be at least 5/8" thick and recessed 3/4" from top of slab and continuous to bottom of slab.
- I. Joint sealer shall be poured elastic type meeting the requirements of ASTM DI190.
- J. Seal Coat for Base Bid Application only shall comply with Section 32 12 18.

PART 3 - EXECUTION

3.1 INSTALLATION OF ASPHALTIC CONCRETE SURFACE COURSE

- A. Patch all holes or other malformations deviating from the true cross section and grade with premixed bituminous material. All small patches shall be thoroughly hand tamped while large patches shall be rolled with power or pneumatic roller.
- B. Prior to applying the Asphaltic Concrete wearing course the base course shall have an asphalt prime coat applied at the rate of 0.5 gallons per square yard all in accordance with Section 504 of the Standard Specification. This rate shall be increased to 0.07 gallons per square yard if the paving is occurring over existing asphaltic concrete surfacing per Section 504.
- C. After the asphalt tack coat has been applied, the asphaltic surface course shall be installed to the lines, grades and thickness shown on the drawings, all in accordance with Sections 501 and 503 of the Standard Specifications.
- D. The tack coat shall be applied on the existing asphalt course to be overlaid and new completed asphaltic binder course at the rate of 0.05 gallons per square yard. Tack coat shall be applied at a rate of 0.07 gallons per square yard.
- E. All bituminous materials shall be applied upon properly prepared surface at rate & temperature specified using a pressure distributor to obtain uniform distribution at all points. To insure proper drainage, the strips shall begin along the centerline of the pavement on a crowned section on the high side of the pavement with a one-way slope. During all applications, the surfaces of adjacent structures shall be protected in such manner to prevent their being spattered or marred. Bituminous materials shall not be discharged into gutters.
- F. The finished elevations shall be as close as possible to the elevations indicated but may be adjusted to ensure positive drainage.
- G. All non-conforming work shall not be accepted and shall be replaced/corrected at no additional charge to the Owner. Any defects, such as raveling, low centers, lack of uniformity or tother imperfections caused by faulty workmanship shall be corrected.
- H. Notify Architect 24 hours in advance of base and sub-base installation so that testing can be scheduled.

3.2 PONDING:

- A. Areas which hold water 24 hours after a rain shall be re-worked at no additional cost.

END OF SECTION

SECTION 32 13 14 - CONCRETE PAVING, SIDEWALKS, CURBS AND GUTTERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 SCOPE OF WORK

- A. Includes all labor & all materials as required for complete installation of concrete walks, curbs and gutters, landings where shown on the Floor & Site Plans and detailed drawings and/or specified herein.
- B. Include all demolition, excavation, backfill, forms, etc. as necessary for the completion of work.

1.3 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect at Bill@Land3.com at least 7 business days prior to Bids.

1.4 REFERENCES

- A. Reference Standards: See Section 01 42 00. In addition to requirements shown or specified, comply with applicable provisions of following for design, materials, fabrication, and installation of component parts:
 1. ACI 117 - Standard Tolerances for Concrete Construction and Materials.
 2. ACI 301 - Specifications for Structural Concrete for Buildings.
 3. ACI 318 - Building Code Requirements for Reinforced Concrete.
 4. CRSI M5P-2 - Manual of Standard Practice for Reinforced Concrete Construction.

1.5 SUBMITTALS

- A. General: Submit in accordance with Section 01 33 00.
- B. Product Data: Submit for splice devices and bar supports.
- C. Shop Drawings: Comply with ACI 315. Indicate sizes, spacings, clearances, locations and quantities of reinforcing steel and welded wire fabric, bending diagrams, splicing, stirrup and tie spacing, and supporting and spacing devices.
- D. Informational Submittals: Submit certifications specified in Quality Assurance article packaged separately from other submittals.

1.6 QUALITY CONTROL

- A. Comply with applicable provisions of ASTM C 94-80.
 1. Mix Design: Local Ready-Mix Manufacturer's standard design approved by Architect.
 2. Testing: By approved testing laboratory selected by owner.

1.7 SUBMITTALS

- A. Concrete mix design for each strength design required.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete:
 1. Sidewalks: Shall have a minimum 28-day compressive strength of 3,500 psi. Maximum size of aggregate shall not exceed 1 1/2". Slump range 2"- 5". Air content by volume shall be 3 to 7 percent. Cement color(white, grey or buff) can be decided by plant to enhance red

finish.

2. Curbs and Gutters: Shall have minimum 28-day compressive strength of 3,500 psi. Aggregate size shall not exceed 1 1/2". Slump range 2"-4". Air content by volume shall be 3 to 7 percent.

B. Curing Materials:

1. Burlap: Dray weight of 11 ounces per square yard.
2. Impervious Sheeting: ASTM C 171. 6 mil. Polyethylene sheeting.
3. Liquid Membrane Curing Compound: ASTM C 309 Type 1D or white pigmented Type 2. Free of paraffin and petroleum.

C. Joint Fillers: Resin impregnated fiberboard or as otherwise shown. Sealant by Section 07 90 00.

D. Water: Fresh, free of injurious amounts of oil, acid, salt, alkali, organic matter or other deleterious substances.

2.2 FORMS

- A. Shall be free of warps, bends, or kinks. Top surface shall not vary more than 1/8" in 10'-0" from a true line. Face surface shall not vary more than 1/4" in 10'-0" from a true plane. Length and quantity of stakes and pins shall be sufficient to hold the form at the correct line and grade when concrete is placed.

2.3 REINFORCING MATERIALS

A. Reinforcing Bars:

1. Deformed Bars: ASTM A615:
 - a. Grade 60, unless indicated otherwise.
2. Deformed Bars for Welded Applications: ASTM A706.
3. Plain Bars: ASTM A615:
 - a. Grade 60, unless indicated otherwise.
 - b. Grade 40 or 60 for dowels at expansion joints in slab-on-grade.
 - c. Provide at other locations where indicated on Drawings.
4. Maximize use of recycled scrap steel with minimum of 60 percent.
5. Standard finish, unless indicated otherwise.

B. Welded Wire Fabric: ASTM A185, fabricated of plain cold-drawn steel wire, ASTM A82. Sheets are required & shall be evenly supported by stands or concrete 1/2 bricks.

1. Wire sizes and spacing as indicated on Drawings.
2. Standard finish, unless indicated otherwise.

2.4 REINFORCING ACCESSORIES

A. Tie Wire: Minimum 16 gage.

B. Supports and Spacers: CRSI MSP-1, and CRSI 65.

C. Welding Electrodes: AWS D1.4 for type and grade of base metals being joined.

D. Dowel Bar Substitute Splice System: Formed from deformed bar material conforming to ASTM A615, Grade 60, with integral nailing flange, threaded to receive dowel.

1. Dowel: ASTM A615, Grade 60, deformed bar with rolled thread,
2. Strength of splice to develop minimum of 125 percent of yield strength of bar designated on Drawings.
3. Finish to match adjacent reinforcing, unless indicated otherwise.

2.5 REINFORCING FABRICATION

A. Reinforcing Bars: Fabricate in accordance with ACI 315.

B. Reinforcing with One or More of Following Defects Not Allowed:

1. Bar lengths or bends exceeding specified fabrication tolerances.
2. Bends or kinks not shown on Drawings.
3. Bars with reduced cross-section or reduced deformations.
4. Bars with heavy rust coating of flakes or scales which dislodge when bar is struck with hammer or bent.

PART 3 - EXECUTION

3.1 PLACING OF CONCRETE

- A. Concrete shall be placed within 45 minutes of the time all ingredients are charged into the mixing drum and shall be placed as close as possible to its final position in the pavement. Placement shall be continuous and at a uniform rate without unscheduled stops, except for equipment failure or emergency. Workmen with foreign material on their clothing or footwear shall not be permitted to walk or work in the concrete during placement and finishing.

Concrete placing operations shall be discontinued when the air temperature reaches 40 degrees F and is falling and shall not be resumed until the temperature is 40 degrees F and rising. Do not pour concrete when temperature is forecast to fall below 32 deg. F within 24 hours. During cold weather conditions, maintain the temperature of the concrete at 50 degrees F for the first 72 hours and above freezing for the remainder of the curing process. During hot weather, surface of the new payment shall be kept wet until covered with a curing medium.

3.2 PLACEMENT OF REINFORCEMENT

- A. Bars shall be positioned on suitable chairs prior to concrete placement. Laps in deformed bars shall be minimum 24-bar diameters and securely wired or fastened to prevent separation. Wire shall be lapped on spacing and securely tied to prevent separation. Wire shall be lapped on spacing and securely tied to prevent separation. Maintain wire at least 1 1/2" above bottom of pavement.
- B. Reinforcing Bars Placement: Comply with CRSI Recommended Practice for Placing Reinforcing Bars and ACI 318.
1. Place steel dowels and securely anchor into position before concrete is placed.
- C. Splices: Splice bars only at locations shown on Drawings.
1. Stagger splices of adjacent bars wherever possible.
 2. Tie lap splices securely with wire to prevent displacement of splices during concrete placement.
 3. Develop welded splices to 125 percent minimum of yield strength of bar. Weld in accordance with AWS D1.4.
 4. Welded Wire Fabric: Lap adjacent sheets of smooth welded wire fabric distance equal to spacing of cross wires plus 2 inches; minimum of 6 inches.
- D. Adjust reinforcing steel within installation tolerance limits to avoid interference with other reinforcing steel, conduits, or other embedded items. Notify Architect or Engineer if interferences are unavoidable. Provide additional reinforcing members around penetration as directed by Architect or Engineer.

3.3 INSTALLATION TOLERANCES

- A. Concrete Cover to Formed Surfaces: Plus/minus 1/4 inch.
- B. Minimum Spacing Between Bars: Minus 1/4 inch.
- C. Top Bars in Slabs and Beams:
1. Members 8 Inches Deep or Less: Plus/minus 1/4 inch.
 2. Members More than 8 inches but Not Over 2 feet Deep: Plus/minus 3/8 inch.
 3. Members More than 2 Feet Deep: Plus/minus 1 inch.
- D. Crosswise of Members: Spaced evenly within 2 inches.

E. Lengthwise of Members: Plus/minus 2 inches.

3.4 FIELD QUALITY CONTROL

A. Field inspection will be performed in accordance with Section *01 40 00*.

B. Responsibilities of Testing and Inspection Agency:

1. Verify reinforcing size, lengths, position, shapes, spacing, and number of bars.
2. Verify reinforcing type, grade, finish, and cleanness.
3. Verify concrete cover to formwork and to top of slabs.
4. Verify type, finish, locations, and height of bar supports and spacers.
5. Inspect lap splices, mechanical splices, and welded splices, including welding procedures and welder qualifications.
6. Inspect condition of reinforcing and supports for damage including bends not detailed, excessive rust, and repair of coatings.
7. Verify placement of additional steel as required by details at openings, sleeves, edge of slabs, and other typical details.

3.5 FINISHING

A. As soon as placed, concrete shall be accurately struck off and screeded to cross section and elevations shown and consolidated by tamping or other methods. Surface shall be finished to uniform texture, true to grade and free of porous places.

1. Texturing: Bottom finish with a soft-bristled broom. Surface shall be free of waves, irregularities or tool marks.
2. Edging: Finish with edging tool with 1/8" radius prior to brooming.

3.6 JOINTS

A. Provide Joints as indicated on drawings.

3.7 CURING AND PROTECTION

A. Reference 2.1.B of this Section for acceptable curing materials. Protect freshly placed concrete from pre-mature drying and excessive cold or hot temperatures.

B. Protect from damage until accepted. Damaged areas shall be removed and replaced for the entire area between regular joints.

END OF SECTION

SECTION 32 92 00 - LAWNS AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 SUMMARY

- A. Section Includes all labor & all materials whether indicated or required for complete installation of
 1. Sodding and all watering and maintenance until substantial completion inspection.
 2. All sod shall be placed on a minimum of 2" of topsoil over 3" tilled soil.
 3. Replacement of damaged grass and soil as a result of this project with matching sod.
 4. Where Seed is indicated on Site Plans, hydromulch shall be provided.
 5. Site Verify existing conditions prior to Bids.
 6. Replace all damaged grass with Sod (to match existing) as a result of damage done by the Contractor.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
 1. Certification of each seed mixture for matching grass.
- B. Product certificates.

1.4 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 1. Pesticide Applicator: State licensed, commercial.
- B. Soil Analysis: For each un-amended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory.
 1. The soil-testing laboratory shall oversee soil sampling.
 2. Report suitability of tested soil for turf growth.
 - a. State recommendations for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
 - b. Report presence of problem salts, minerals, or heavy metals; if present, provide additional recommendations for corrective action.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Seed (hydromulch) Deliver packaged material for distribution in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.
- B. Sod: Harvest, deliver, store and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

1.6 MAINTENANCE SERVICE

- A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
 1. Sodded Turf: Final Completion.

1.7 WARRANTY

- A. Warrant grass material to remain alive and be in a healthy and vigorous condition for a period of 1 year

after completion and acceptance of the entire project or for the warranty period required by the general conditions, whichever is longer.

- B. During the Warranty Period replace, in accordance with the drawings and specifications, all grass that are dead or, as determined by the Architect, are in an unhealthy or unsightly condition, and have lost their natural shape not due to the Owner's negligence. The cost of such replacement(s) is at Contractor's expense. Warrant all replacement plants for 6 months after installation or until expiration of original warranty, whichever is longer. Warranty shall not include damage or loss of grass, plants, or ground covers caused by fires, floods, freezing rains, lightning storms, or winds over 75 miles per hour, winter kill caused by extreme cold or severe winter conditions not typical of planting areas; acts of vandalism or negligence on the part of the Owner.

1.8 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 - PRODUCTS

- 2.0 HYDRO-MULCH: All seed or hydro mulch areas indicated on the plan shall be Hydro mulch and shall include Conweb Fibers 2000 wood fiber mulch with 100% guar gum-based organic tackifier with dark green marker dye. For each 1000 SF, mix one bale with 25 lb. of 13.13.13 water soluble fertilizer and 150 gallons of water along with the following seed content: Sept. thru March, use 5 lbs. of rye seed, 1 lb. of unhulled common Bermuda & ¼ lb. centipede grass seed. From April thru August, use 2 lbs of hulled common Bermuda grass seed and ½ lb. of centipede grass seed.

The water for temporary irrigation of the hydromulch shall be furnished by the General Contractor. The General Contractor shall provide the temporary hoses and sprinkler heads until Final Completion (NOT substantial completion).

2.1 TURFGRASS SOD

- A. Turfgrass Sod: Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
- B. Turfgrass Species: Sod of grass species as follows:
 - 1. Bermuda Tif419

2.2 INORGANIC SOIL ADDITIVES

- A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 - 1. Class: T, with a minimum of 99 percent passing through No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through No. 60 (0.25-mm) sieve.
 - 2. Class: O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through No. 60 (0.25-mm) sieve.
- B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, and with a minimum of 99 percent passing through No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through No. 40 (0.425-mm) sieve.
- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- D. Aluminum Sulfate: Commercial grade, unadulterated.

- E. Perlite: Horticultural perlite, soil amendment grade.
- F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 (0.30-mm) sieve.
- G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.
- H. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.
- I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.3 ORGANIC SOIL ADDITIVES

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch (12.5-mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.
- B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture, with a pH range of 3.4 to 4.8.
- C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.
- D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
- E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.4 FERTILIZERS

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1 percent nitrogen and 10 percent phosphoric acid.
- B. Superphosphate: Not allowed.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
- D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.5 PLANTING SOILS

- A. Planting Soil: Imported topsoil or manufactured topsoil from off-site sources; do not obtain from agricultural land, bogs or marshes. Verify suitability of soil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix soil with the following soil amendments in the following quantities to produce planting soil:
 1. Ratio of Loose Compost to Topsoil by Volume: 1:2.
 2. Ratio of Loose Sphagnum Peat to Topsoil by Volume: 1:4
 3. Weight of Lime per 1000 Sq. Ft. (92.9 Sq. m): As recommended by soil report.
 4. Weight of Sulfur, Iron Sulfate, Aluminum Sulfate per 1000 Sq. Ft. (92.9 Sq. m): As specified by soil report.
 5. Weight of Agricultural Gypsum per 1000 Sq. Ft. (92.9 Sq. m): As recommended by soil report.

6. Volume of sand plus 10% of Diatomaceous Earth per 1,000 sq.ft. Sq. m): .
7. Weight of Bonemeal per 1000 Sq. Ft. (92.9 Sq. m): As recommended by soil report.
8. Weight of Superphosphate per 1000 Sq. Ft. (92.9 Sq. m): As recommended by soil report.
9. Weight of Commercial Fertilizer per 1000 Sq. Ft. (92.9 Sq. m): As recommended by soil report.
10. Weight of Slow-Release Fertilizer per 1000 Sq. Ft. (92.9 Sq. m): As recommended by soil report.

B. PESTICIDES

1. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 TURF AREA PREPARATION

- A. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- B. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- C. Irrigation System shall be functioning prior to lawn installation.
- D. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.2 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
 1. Lay sod across angle of slopes exceeding 1:3.
 2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below sod.

3.3 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
- B. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain height appropriate for species without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings.
- C. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

3.4 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:
1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).
 2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

END OF SECTION

SECTION 32 93 00 - TREES PLANTS AND GROUND COVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions are hereby made a part of this section.

1.2 DESCRIPTION

- A. Provide trees, plants and ground covers as shown and specified. The work includes all labor & all materials required for complete installation of:
 1. Soil preparation.
 2. Trees, plants and ground covers.
 3. Planting mixes.
 4. Mulch and planting accessories.
 5. Watering and maintenance until Substantial Completion.

1.3 RELATED WORK

- A. Section 31 00 00 Earthwork.
- B. Section 32 84 00 Irrigation System.
- C. Section 32 92 00 Lawns and Grasses

1.4. QUALITY ASSURANCE

- A. Comply with Section 01 40 00 requirements.
- B. Plant names indicated, comply with "Standardized Plant Names" as adopted by the latest edition of the American Joint Committee of Horticultural Nomenclature. Names of varieties not listed conform generally with names accepted by the nursery trade. Provide stock true to botanical name and legibly tagged. No substitutions will be allowed unless approved in writing by Landscape Architect.
- C. Comply with sizing and grading standards of the latest edition of "American Standard for Nursery Stock". A plant shall be dimensioned as it stands in its natural position.
- D. All plants shall be nursery grown under climatic conditions similar to those in the locality of the project for a minimum of 2 years.
- E. Stock furnished shall be at least the minimum size indicated. Larger stock is acceptable, at no additional cost, and providing that the larger plants will not be cut back to size indicated. Where a minimum and maximum size (size range) is specified, the average of the lot will approximate the midpoint of the specified size range and 50% of the lot will be within the middle 1/3 of the specified range. Where a caliper and height range is given, the minimum of each range shall be acceptable.
- F. The contractor shall have a minimum of 5 years experience installing commercial landscape installations similar in size to the work proposed in these contract documents.

1.5 SUBMITTALS

- A. Submit the following material samples:
 1. Mulch.
 2. Planting accessories.
 3. Soil conditioner.
- B. Upon plant material acceptance, submit written maintenance instructions recommending procedures for maintenance of plant materials.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fertilizer in original, unopened, undamaged containers showing weight, analysis, and name of manufacturer. Store fertilizer to prevent wetting and deterioration.

- B. Take all precautions customary in good trade practice in preparing plants for moving. Workmanship that fails to meet the highest standards will be rejected. This includes spraying deciduous plants in foliage with an approved anti-desiccant immediately after digging when necessary to prevent dehydration. Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment, invoice, or order to stock and, upon arrival, the certificate will be filed with the Architect. Protect all plants from drying out. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet bark mulch, or other acceptable manner. Water heeled-in plants daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches.

1.7 PROJECT CONDITIONS

- A. Protect existing utilities, paving, and other facilities from damage caused by planting operations. Have underground utility locations marked by utility companies and consult architectural and engineering drawings of the site for locations of other known utility lines.
- B. A list of plants including a schedule of sizes, quantities, and other requirements is shown on the drawings. In the event that quantity discrepancies or material omissions occur in the plant material list, the planting plans shall govern.
- C. The irrigation system shall be installed prior to planting, locate, protect, and maintain the system during planting. Repair irrigation system components damaged during planting operations at this contractors expense.

1.8 WARRANTY

- A. Warrant plant material to remain alive and be in a healthy and vigorous condition for a period of 1 year after substantial completion.
- B. During the Warranty Period replace, in accordance with the drawings and specifications, all plants that are dead or, as determined by the Architect, are in an unhealthy or unsightly condition, and have lost their natural shape not due to the Owner's negligence. The cost of such replacement(s) is at Contractor's expense. Warrant all replacement plants for 6 months after installation or until expiration of original warranty, whichever is longer. Warranty shall not include damage or loss of trees, plants, or ground covers caused by fires, floods, freezing rains, lightning storms, or winds over 75 miles per hour, winter kill caused by extreme cold or severe winter conditions not typical of planting areas; acts of vandalism or negligence on the part of the Owner.

1.9 BIDDING REQUIREMENTS

- A. Bidder shall review the Construction Documents and advise the architect of all concerns with regard to his Work 7 days prior to bids; otherwise, include in his bid all cost for the complete functioning performance of his Work. Should the sub-contractor have questions or need clarifications, he shall notify the architect/engineer at least 7 business days prior to Bids, preferably by email to Bill@Land3.com.

PART 2 MATERIALS

2.1 PLANTS

- A. Provide plants typical of their species or variety; with normal, densely-developed branches and vigorous, fibrous root systems. Provide only sound, health, vigorous plants free from defects, disfiguring knots, sunscald injuries, frost cracks, abrasions of the bark, plant diseases, weeds, insect eggs, borers, and all forms of infestation. All plants shall have a fully developed form without voids and open spaces. Deciduous shade trees shall be straight and symmetrical with a crown having a persistent main leader unless otherwise specified. The size of the crown shall be in good overall proportion to the total height of the tree. Evergreen trees shall be of form typical of the species and not unnaturally sheared or color treated.
- B. Balled and burlapped plants shall be dug with firm, natural balls of soil of sufficient diameter and depth

to encompass the fibrous and feeding root system necessary for full recovery of the plant. Balls shall be firmly wrapped with burlap or similar material and bound with twine, cord, or wire. Balled and burlapped plants shall be watered prior to transportation and kept moist until planted.

- C. Bare-root plants are not to be used.
- D. Container-grown stock: Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.
 - 1. No plants shall be loose in the container.
 - 2. Container stock shall not be root nor pot bound.
- D. Unless otherwise called for provide tree species with a single main trunk. Trees that have the main trunk forming a `Y' shape are not acceptable.
- E. Plants of 1 variety planted in rows shall be matched in form. Unless otherwise directed, smallest plants shall be planted at the ends of rows graduating to the largest plants at the centers of rows.
- F. Plants larger than those specified in the plant list may be used when acceptable to the Landscape Architect. If the use of larger plants is acceptable, increase the spread of roots or root ball in proportion to the size of the plant.
- G. The height of the trees, measured from the crown of the roots to the top of the top branch, shall not be less than the minimum size designated in the plant list.
- H. No pruning wounds shall be present with a diameter of more than 1", and such wounds must show vigorous bark on all edges.
- I. Evergreen trees shall be branched to the ground unless otherwise specified.
- J. Shrubs and small plants shall meet the requirements for spread and height indicated in the plant list.
 - 1. The measurements for height shall be taken from the ground level to the average height of the top of the plant and not the longest branch.
 - 2. Single stemmed or thin plants will not be accepted.
 - 3. Side branches shall be generous, well-twigged, and the plant as a whole shall be well bushed to the ground.
 - 4. Plants shall be in a moist, vigorous condition, free from dead wood, bruises, or other root or branch injuries.

2.2 ACCESSORIES

- A. Topsoil for Planting Beds: Fertile, friable, natural topsoil of loamy character, containing not less than 1½% organic matter, without admixture of subsoil material, obtained from a well-drained arable site, reasonably free from clay, lumps, coarse sands, stones, plants, roots, sticks, and other foreign materials, with acidity range of between pH 6.5 and 7.0.
- B. Provide topsoil free of substance harmful to the plants which will be grown in the soil.
- C. Public Roads Administration Classification shall be A-4 or A-5 silt loam. Extractable quantities of phosphorous, potassium, and magnesium shall be 100 parts per million each (minimum). Minimum extractable quantity of calcium shall be 1000 parts per million. Method of testing shall be as performed by State Cooperative Extension Service.
- D. Soil Conditioner:
 - 1. Decomposed pine bark: Consisting of pure bark sawmill fines mixed with approximately 10% sand. Sawmill fines shall be 1/2" maximum size and shall have been composted a minimum of 2 years with a pH range of 6.0 to 6.5.
 - 2. Peat Moss: Commercial Quality Michigan or Canadian. Black to brown in color, weed and seed free granulated raw peat or baled peat, containing not more than 9% mineral content on a dry basis.
- E. Fertilizer: Commercial type three-month-time-release approved by the Landscape Architect, containing 12% nitrogen, 12% phosphoric acid, and 12% potash by weight. 1/4 of nitrogen in the form of nitrates,

1/4 in form of ammonia salt, and 1/2 in form of organic nitrogen.

- F. Anti-Desiccant: Protective film emulsion providing a protective film over plant surfaces; permeable to permit transpiration. Mixed and applied in accordance with manufacturer's instructions.
- G. Mulch: Clean pine straw. Free of branches, cones or other impurities. Furnish in bales or bulk.
- H. Water: Free of substances harmful to plant growth. Hoses or other methods of transportation furnished by Contractor.
- I. Stakes for guying and staking: pressure treated with preservative for ground contact pine, 2" x 4" x length shown in the drawings and 2" x 2" x length shown in drawings.
- J. Guying/Staking Wire: No. 14 gage galvanized wire. Turnbuckles: Galvanized steel of size and gage required to provide tensile strength equal to that of the wire. Turnbuckle openings shall be at least 3". Staking and Guying Hose: Two-ply, reinforced black garden hose not less than 1/2" inside the diameter.
- K. Steel Edging: Painted (green or black as selected by Architect) steel 14 ga. thick x 4" depth, carbon steel with interlocking joints and steel pins (minimum 9" length). As manufactured by Collier Manufacturing, Joseph T. Ryerson and Son, Inc. Or 14 ga. Thick x 4" depth carbon steel with lap joints and steel pins as manufactured by Flow Specialties. Or approved equal.
- L. Cow Manure: Sterilized, composted, commercial brand furnished in 40 pound bags.
- M. Pre-Emergent Herbicide: Labeled for use in ornamental landscapes.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine proposed planting areas and conditions of installation. Do not start planting work until unsatisfactory conditions are corrected.

3.2 PREPARATION

- A. Planting shall be performed only by experienced workmen familiar with planting procedures under the supervision of a qualified supervisor. All plant stock shall be handled with reasonable care to prevent injuries to trunk, branches, roots, and leaves.
- B. Locate plants as indicated or as approved in the field after staking by the Contractor. If obstructions are encountered that are not shown on the drawings, do not proceed with planting operations until alternate plant locations have been selected and approved by the Landscape Architect.
- C. Excavate circular plant pits with vertical sides, except for plants indicated to be planted in beds. Provide shrub and tree pits at least twice the diameter of the root system. Depth of pit shall accommodate the root system plus 6". Scarify and compact the soil in the bottom of the pit. Form a 3" high basin around pit with excess soil.
- D. After the planting pit has been dug, distribute over the soil from the pit a planting mixture consisting of 3 parts topsoil, 2 parts composted pine bark, 1 part peat moss, fertilizer, and cow manure (40 lbs. per cubic yard of soil mixture). Mix these evenly with the soil from the pit. Fertilize at the rate recommended by the manufacturer.
- E. Spade all bed areas to a depth of 8". Add 3 parts topsoil, 2 parts composted pine bark, 1 part peat moss, and fertilizer (same ratio as in individual plant pits), bringing the grade of the prepared beds 4" above existing grade. Till bed areas to incorporate the mixture to a depth of 6".
- F. Apply pre-emergent herbicide as recommended by manufacturer.

3.3 INSTALLATION

- A. Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure. For well-

drained soil, set plant so that when planted and settled it will bear the same relation to finished grade that it did to the soil surface in the original place of growth. For plants in heavy soil, set plant material 2"-3" above the finish grade. No filling will be permitted around trunks and stems. Backfill the pit with planting mixture. Do not use frozen or muddy mixtures for backfilling. Form a 3" high ring of soil around the edge of each planting pit to retain water. Soil rings are not required for plants located in bed areas.

- B. After balled and burlapped plants are set, install planting soil mixture around bases of balls and fill all voids. Remove wires from root balls.
- C. Space ground cover plants in accordance with indicated dimensions. Adjust spacing as necessary to evenly fill planting beds with indicated quantity of plants. Plant to within 12" of the trunks of trees and shrubs within planting bed and to one-half of specified spacing of edge of bed. Stagger spacing on alternate rows. Set plants in neat, straight rows, parallel to the nearest paving edge or header at intervals shown in the drawings.
- D. Metal Edging: Anchor edging with min. 3 pins/section.
- F. Mulching: Mulch trees and shrub and ground cover beds with required mulching material 2" deep immediately after planting. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.
- G. Guying and Staking: Stake/guy all trees as shown in the drawings immediately after lawn seeding or sodding operations and prior to acceptance. When high winds or other conditions which may effect tree survival or appearance occur, stake immediately after planting.
- H. Pruning: Prune branches of deciduous stock, after planting, to balance the loss of roots and preserve the natural character appropriate to the particular plant requirements. In general, remove 1/2 to 1/3 of the leaf bearing buds, proportion shall in all cases be acceptable to the Landscape Architect. Remove or cut back broken, damaged, or unsymmetrical growth of new wood. Make cuts flush with trunk or intersecting branch.
- I. Multiple leader plants: Preserve the leaders which will best promote the symmetry of the plant. Cut branches flush with the trunk or main branch, at a point beyond a lateral shoot or bud a distance of not less than 1/2 the diameter of the supporting branch. Make cut on an angle.
- J. Prune evergreens only to remove broken or damaged branches.

3.4 MAINTENANCE

- A. Maintain plantings until final inspection. Maintenance shall include pruning, cultivating, weeding, watering, mowing, and application of appropriate insecticides and fungicides necessary to maintain plants free of insects and disease. Re-set settled plants to proper grade and position. Restore planting saucer and adjacent materials and remove dead material. Tighten and repair guy wires as stakes as required. Correct defective work as soon as possible after deficiencies become apparent and weather and season permit. Water trees, plants, and ground cover beds within the first 24 hours of initial planting. Irrigate all plants regularly in order to supplement natural rainfall to a total of 2" per week until final acceptance. Irrigation by hose or any other method shall not be applied with a force that will displace mulch or cause soil erosion and shall not be applied so quickly that it cannot be absorbed by the mulch and plants. Replace mulch as needed. Remove displaced mulch from lawns and pavements. In plant beds, grass and weeds shall not be allowed to reach a height of 3" before being completely removed, including the root growth. When plants are in groups other than cultivated beds, the Contractor shall not permit grass or other vegetation between them to become more than 5" in height. Bed areas must be completely free of weeds for final acceptance. Mow grass when it reaches a height of 3". Cut to a height of 2".
- B. Meet with the Owner's representatives and instruct them concerning proper maintenance procedures. Provide a written report to the Owner and Landscape Architect of the recommended maintenance

procedures set forth at this meeting.

- C. After the Owner begins maintenance of the project, inspect the project monthly for the duration of the warranty period. Provide a written report to the Owner and Architect each month addressing any observed inadequacies in maintenance by the Owner and listing corrective procedures.

3.5 ACCEPTANCE

- A. Inspection to determine acceptance of planted areas will be made by the Architect, upon Contractor's request. Provide notification at least 3 working days before requested inspection date.
- B. Planted areas will be accepted provided all requirements, including maintenance, have been complied with and plant materials are alive and in a healthy, vigorous condition.

3.6 CLEANING

- A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, soil, debris, and equipment. Repair damage resulting from planting operations.

END OF SECTION