Project Manual

Barton Community College
Camp Aldrich Trails Cabin Bunk House
884 NE 110th Ave.
Claflin, Kansas 66530

Architects Job Number: 1925

DATE: December 6, 2019

SET NUMBER: ___________
PROJECT: Barton County Community College
Camp Aldrich Trails Cabin Bunk House
884 NE 110th Ave
Claflin, Kansas 67525

ARCHITECT’S PROJECT NUMBER: 1925
DATE: December 6, 2019

TABLE OF CONTENTS

Cover Page
A. Table of Contents
B. Invitation To Bid
C. Instructions to Bidders
D. Bid Form
E. General Conditions
F. Specifications:

<table>
<thead>
<tr>
<th>Division 1 - General Requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>01100 Summary of the Work</td>
</tr>
<tr>
<td>01210 Allowances</td>
</tr>
<tr>
<td>01230 Alternates</td>
</tr>
<tr>
<td>01250 Contract Modifications Procedures</td>
</tr>
<tr>
<td>01290 Payment Procedures</td>
</tr>
<tr>
<td>01310 Project Management and Coordination</td>
</tr>
<tr>
<td>01320 Construction Progress Documentation</td>
</tr>
<tr>
<td>01322 Photographic Documentation</td>
</tr>
<tr>
<td>01330 Submittal procedures</td>
</tr>
<tr>
<td>01400 Quality Requirements</td>
</tr>
<tr>
<td>01420 References</td>
</tr>
<tr>
<td>01500 Temporary Facilities</td>
</tr>
<tr>
<td>01600 Product Requirements</td>
</tr>
<tr>
<td>01700 Execution Requirements</td>
</tr>
<tr>
<td>01731 Cutting and Patching</td>
</tr>
<tr>
<td>01732 Selective Demolition</td>
</tr>
<tr>
<td>01770 Closeout Procedures</td>
</tr>
<tr>
<td>01781 Project Record Documents</td>
</tr>
<tr>
<td>01782 Operation and Maintenance Data</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Division 2 - Site Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>02221 Building Demolition</td>
</tr>
<tr>
<td>02230 Site Clearing</td>
</tr>
<tr>
<td>02260 Excavation Support and Protection</td>
</tr>
<tr>
<td>02300 Earthwork</td>
</tr>
<tr>
<td>02530 Sanitary Sewerage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Division 3: Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>03300 Cast In Place Concrete</td>
</tr>
<tr>
<td>03360 Polished Concrete Floor Slabs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Division 4 Masonry</th>
</tr>
</thead>
<tbody>
<tr>
<td>04810 Unit Masonry Assemblies</td>
</tr>
</tbody>
</table>
Division 5: Metals Not Applicable

Division 6: Wood and Plastics:
06100 Rough Carpentry
06108 Exterior Rough Carpentry
06160 Sheathing

Division 7: Thermal and Moisture Protection:
07210 Building Insulation
07460 Fiber-Cement Siding
07620 Sheet Metal Flashing and Trim
07920 Joint Sealants

Division 8: Doors and Windows:
08110 Steel Doors and Frames
08410 Aluminum-Framed Entrances and Storefront
08711 Building Hardware
08800 Glazing
08830 Mirrors

Division 9: Finishes:
09111 Non-Load-Bearing Steel Framing
09911 Painting

Division 10: Specialties
10155 Toilet Compartments
10520 Fire Protection Specialties

Division 11 & 12 Not Applicable

Division 13: Special Construction
13125 Metal Building Systems

Division 14: Conveying Systems Not Applicable
014240 Hydraulic Elevators

Division 15 Mechanical and Plumbing:
15TOC Table of Contents
15A Mechanical
15B Plumbing, Heating, Ventilating and Air Conditioning
15C Fire Sprinkler System

Division 16 Electrical:
16TOC Table of Contents
16A General Requirements
16B Power and Lighting

Appendix:
The following AIA Documents shall be used on this project:

A101 Standard Form of Agreement Between Owner and Contractor
A201 General Conditions to the Contract for Construction
G701 Change Order
G702  Application and Certificate for Payment
G703  Continuation Sheet
G704  Certificate of Substantial Completion
G705  Certificate of Insurance
G706  Contractor's Affidavit of Payment of Debts and Claims
G706A  Contractor's Affidavit of Release of Liens
G707  Consent of Surety Company to Final Payment
G709  Proposal Request
G710  Architect's Supplemental Instructions
G713  Construction Change Authorization

END OF TABLE OF CONTENTS
Invitation to bid is hereby made by Barton Community College to the General Contractors who bid on the Insurance Adjustment Phase of this project, to bid on a lump sum contract for the above project. The work will consist of demolition work and the construction of a new Trails Cabin Bunk House including the related mechanical and electrical work as defined on the proposed bid documents.

All bidders are required to visit the job site and attend the pre-bid conference to understand the extent of the work required of the project. The bidders are required to comply with all state and local laws and regulations for the work related to this project.

Sealed Lump Sum Bids will be received from bidders and then opened publicly. The opening will take place in accordance with the following:

**Mandatory Pre-Bid Meeting:** December 16, 2019 / 4:00pm at the Site

- **Date:** January 9, 2020
- **Place:** Barton Community College
  - Kirkman Visitor Center
  - 245 NE 30th Road
  - Great Bend, Kansas 67530
- **Time:** 2:00PM

Sealed bids must be received by mail or delivered to the Owner prior to the opening date and time. Late bids will be returned un-opened.

Bid documents may be obtained and/or reviewed after December 9, 2019 from the office of DMA ARCHITECT, PA / 2035 East Iron, Suite #100 / Salina, Kansas. Bid documents may also be viewed at the DMA Architects, PA web site www.dmapa.com plan room. The password for the project 1925.

A ten percent (10%) retainage will be withheld from each monthly progress payment made to the Contractor by the owner. The retainage will be released at the end of the project once all closeout documents and submitted, and all punch list work is completed and approved by the Architect.

Bids shall be guaranteed for 30 days. Bidder pledges to enter into a contract for the project if a contract in awarded within the 30 day bid guarantee period.

The Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources. The cost shall be included in the Bid. The Bidder shall deliver the required bonds to the Owner with the
executed contracts. The bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum. The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney. The Bonds shall be written as Statutory Bonds in the full amount of the Contract and placed on file with the Clerk of the District Court. The Surety Company shall be approved by the United States Treasury Department, Licensed by the State of Kansas, and approved for bonding the amount required for this project.

The Owner intends to award this work upon review and approval of the bids received. The successful Contractor will be given ten (10) days after notification of the contract award to return the signed contracts with the required insurance certificates attached thereto. Upon approval of the signed contracts and their attachments the contractor will be given notification to proceed with the work. Further description of the bidding requirements, and liquidated damages will be provided in the bid documents.

The competence and responsibility of the bidders and of their Sub-Contractors will be considered in awarding the Contract. The Owner reserves the right to waive irregularities in bids and to reject any or all bids.

Bidders are to examine carefully the drawings and specifications, visit the site of the work, and fully inform themselves as to all conditions and matters which can in any way affect the work or cost thereof. Should the bidder find discrepancies in or omissions from the drawings, specifications, or other documents, or should he be in doubt as to their meaning, he should at once notify the Architect and obtain clarification prior to submitting any bid. Any interpretation, amendments, or revisions will be made by addendum, mailed or delivered to each bidder of record who has received a set of documents and shall there by become a part of the Bid Documents.

CONSULTING ARCHITECT

Donnie D. Marrs

Donnie D. Marrs, AIA

cc: Mark Dean
BID FORM

CONTRACTOR: ________________________________________________

TO: Barton County Community College

1. Pursuant to the proposed Contract Documents relating to the PROPOSED BARTON COUNTY COMMUNITY CAMP ALDRICH TRILS CABIN BUCK HOUSE, the undersigned, having become thoroughly familiar with the terms and conditions of the proposed Contract Documents, and having visited the site where the proposed work is to be constructed, hereby proposes and agrees to fully perform the work in strict accordance with the proposed contract documents, including furnishing of any and all labor and materials, and to do all of the work required to construct and complete said work in accordance with the Proposed Contract Documents.

2. The undersigned hereby understands and agrees that the Owner reserves the right to reject this bid, but that this bid shall remain open and shall not be withdrawn for a period of thirty (30) days from the bid date.

3. The undersigned acknowledges receipt of the following addenda, which have been made a part of the Proposed Contract Documents:

( ) Addendum Number One (1)
( ) Addendum Number Two (2)
( ) Addendum Number Three (3)

4. The undersigned hereby understands and agrees to provide said work in accordance with the proposed contract documents for the following sums of money:

BASE BID: All work of the project that not including Alternate Bid Work:
All labor and material, services and equipment necessary for complete the base bid work described in the Proposed Contract Documents:

$_________________________ Dollars
$_________________________ Dollars ($_______________)

ALTERNATE BID #1 Exterior Wall Construction as detailed on the bid documents:
All labor and material, services and equipment necessary for complete the alternate bid work described in the Proposed Contract Documents:

$_________________________ Dollars
$_________________________ Dollars ($_______________)

5. If awarded this contract, the undersigned will begin work upon notification to proceed and will complete all the work on or before May 30, 2020. Refer to General Conditions for liquidated damages provisions.

6. If written notice of acceptance of this bid is mailed or delivered to the undersigned within thirty (30) days after the date set for the opening of this bid, the undersigned will execute and deliver the Contract Documents to the Owner in accordance with this bid as accepted, and will also furnish and deliver to the Owner the Performance Bond, Labor and Material Payment Bond, and will provide proof of insurance coverage, all within ten (10) days after personal delivery or after deposit in the mail of the notification of acceptance of this bid.

7. Notice of acceptance, or request for additional information may be addressed to the undersigned at the address set forth below.

8. The names of all persons interested in the foregoing bid as principals are:

BIDDER: ______________________________________________________
Phone / Fax: __________________________________________________
ADDRESS: ____________________________________________________

BF - 1
DATE OF PROPOSAL: ______________________________________________
SIGNATURE OF BIDDER: ____________________________________________

(IMPORTANT NOTICE: If bidder or other interested person is a corporation, give legal name of
corporation, state where incorporated and names of president and secretary thereof; if a partnership, give name
of the firm and names of all individual co-partners composing the firm; if bidder or other interested person is an
individual, give first and last names in full.)

NOTE: BID FORM IS TO BE SUBMITTED IN DUPLICATE, TOGETHER WITH GUARANTEE, (BID BOND,
OR CERTIFIED CHECK) AS SPECIFIED IN THE INVITATION TO BID.

The following are sub-contractors and material suppliers which will be used by the contractor in performing the work
required of the bid documents. The following trades shall be provided by qualified sub-contractors:

Mechanical Contractor: ____________________________________________
Plumbing Contractor: _____________________________________________
Electrical Contractor: _____________________________________________
Masonry Contractor: _____________________________________________
Metal Building Manufacturer: _______________________________________
Painting Contractor: _____________________________________________
Floor Polishing Contractor: ________________________________________

END OF BID FORM
Instructions to Bidders

for the following PROJECT:
(Name and location or address)
Camp Aldrich
Trails Cabin Bunk House
884 NE 110th Ave
Claflin, KS 67525

THE OWNER:
(Name, legal status and address)
Barton County Community College
245 NE 30th Road
Great Bend, KS 67530

THE ARCHITECT:
(Name, legal status and address)
DMA Architects, PA, Subchapter S Corporation
2035 E Iron #100 / Salina, Kansas 67401

TABLE OF ARTICLES

1 DEFINITIONS
2 BIDDER'S REPRESENTATIONS
3 BIDDING DOCUMENTS
4 BIDDING PROCEDURES
5 CONSIDERATION OF BIDS
6 POST-BID INFORMATION
7 PERFORMANCE BOND AND PAYMENT BOND
8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

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

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.
ARTICLE 1  DEFINITIONS
§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

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

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

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

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

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

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

ARTICLE 2  BIDDER’S REPRESENTATIONS
§ 2.1 The Bidder by making a Bid represents that:
§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

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

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

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

ARTICLE 3  BIDDING DOCUMENTS
§ 3.1 COPIES
§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder’s deposit will be refunded.

§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.
§ 3.1.3 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

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

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

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

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

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

§ 3.3 SUBSTITUTIONS

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

§ 3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect’s decision of approval or disapproval of a proposed substitution shall be final.

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

§ 3.3.4 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 ADDENDA

§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

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

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

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

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

§ 4.1.1 Bids shall be submitted on the forms included with the Bidding Documents.
§ 4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

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

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

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

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

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

§ 4.2 BID SECURITY
§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

§ 4.3 SUBMISSION OF BIDS
§ 4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder’s name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation “SEALED BID ENCLOSED” on the face thereof.

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

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

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

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID
§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

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

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

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

ARTICLE 5 CONSIDERATION OF BIDS
§ 5.1 OPENING OF BIDS
At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

§ 5.2 REJECTION OF BIDS
The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

§ 5.3 ACCEPTANCE OF BID (AWARD)
§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner’s judgment, is in the Owner’s own best interests.

§ 5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION
§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT
Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor’s Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

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

§ 6.3 SUBMITTALS
§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:
   1. a designation of the Work to be performed with the Bidder’s own forces;
   2. names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
   3. names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

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

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

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

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 BOND REQUIREMENTS

§ 7.1.1 The Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

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

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

§ 7.2 TIME OF DELIVERY AND FORM OF BONDS

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner with the signed contracts.

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

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

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

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

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

8.3 RETAINAGE OF PAYMENT ON APPLICATIONS: A ten percent (10%) retainage will be withheld from each month's progress payments made to the Contractor by the Owner. The withheld retainage will be released at the end of the project once all closeout documents are submitted, and punch list work is completed, and approved by the Architect.
General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)
Burton Community College
Camp Aldrich Trails Cabin Bunk House
884 NE 110th Ave
Clafin, KS 67525

THE OWNER:
(Name and address)
Burton Community College
245 NE 30th Road
Great Bend, KS 67530

THE ARCHITECT:
(Name and address)
DMA Architects, PA, Subchapter S Corporation
2035 E Iron #100 / Salina, Kansas 67401

TABLE OF ARTICLES
1 GENERAL PROVISIONS
2 OWNER
3 CONTRACTOR
4 ARCHITECT
5 SUBCONTRACTORS
6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7 CHANGES IN THE WORK
8 TIME
9 PAYMENTS AND COMPLETION
10 PROTECTION OF PERSONS AND PROPERTY
11 INSURANCE AND BONDS
12 UNCOVERING AND CORRECTION OF WORK
13 MISCELLANEOUS PROVISIONS
14 TERMINATION OR SUSPENSION OF THE CONTRACT
15 CLAIMS AND DISPUTES

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

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.
Acceptance of Nonconforming Work  
9.6.6, 9.9.3, 12.3  
Acceptance of Work  
9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3  
Access to Work  
3.16, 6.2.1, 12.1  
Accident Prevention  
10  
Acts and Omissions  
3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.4.2, 13.7.1, 14.1, 15.2  
Addenda  
1.1, 3.11.1  
Additional Costs, Claims for  
3.7.4, 3.7.5, 6.1.1, 7.3.7.5, 10.3, 15.1.4  
Additional Inspections and Testing  
9.4.2, 9.8.3, 12.2.1, 13.5  
Additional Insured  
11.1.4  
Additional Time, Claims for  
3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, 15.1.5  
Administration of the Contract  
3.1.3, 4.2, 9.4, 9.5  
Advertisement or Invitation to Bid  
1.1.1  
Aesthetic Effect  
4.2.13  
Allowances  
3.8, 7.3.8  
All-risk Insurance  
11.3.1, 11.3.1.1  
Applications for Payment  
4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5.1, 9.6.3, 9.7.1, 9.10, 11.1.3  
Approvals  
2.1.1, 2.2.2, 2.4, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10, 4.2.7, 9.3.2, 13.5.1  
Arbitration  
8.3.1, 11.3.10, 13.1.1, 15.3.2, 15.4  
ARCHITECT  
4  
Architect, Definition of  
4.1.1  
Architect, Extent of Authority  
2.4.1, 3.12.7, 4.1, 4.2, 5.2, 6.3.1, 7.1.2, 7.3.7, 7.4, 9.2.1, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.5.1, 13.5.2, 14.2.2, 14.2.4, 15.1.3, 15.2.1  
Architect, Limitations of Authority and Responsibility  
2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4.1, 9.4.2, 9.5.3, 9.6.4, 15.1.3, 15.2  
Architect's Additional Services and Expenses  
2.4.1, 9.1.1.1, 12.2.1, 13.5.2, 13.5.3, 14.2.4  
Architect's Administration of the Contract  
3.1.3, 4.2, 3.7.4, 15.2, 9.4.1, 15.5  
Architect's Approvals  
2.4.1, 3.1.3, 3.5.1, 3.10.2, 4.2.7  
Architect's Authority to Reject Work  
3.5.1, 4.2.6, 12.1.2, 12.2.1  
Architect's Copyright  
1.1.7, 1.5  
Architect's Decisions  
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3.1, 7.3.7, 7.3.9, 8.1.3, 8.3.1, 9.2.1, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.5.2, 15.2, 15.3  
Architect's Inspections  
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.5  
Architect's Instructions  
3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.5.2  
Architect's Interpretations  
4.2.11, 4.2.12  
Architect's Project Representative  
4.2.10  
Architect's Relationship with Contractor  
1.1.2, 1.5, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5.1, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.1.3, 4.2, 5.2, 6.2.2, 7.8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8.9, 9.10.2, 10.3, 11.3.7, 12, 13.4.2, 13.5, 15.2  
Architect's Relationship with Subcontractors  
1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3.7  
Architect's Representations  
9.4.2, 9.5.1, 9.10.1  
Architect's Site Visits  
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5  
Asbestos  
10.3.1  
Attorneys' Fees  
3.18.1, 9.10.2, 10.3.3  
Award of Separate Contracts  
6.1.1, 6.1.2  
Award of Subcontracts and Other Contracts for Portions of the Work  
5.2  
Basic Definitions  
1.1  
Bidding Requirements  
1.1.1, 5.2.1, 11.4.1  
Binding Dispute Resolution  
9.7.1, 11.3.9, 11.3.10, 13.1.1, 15.25, 15.2.6.1, 15.3.1, 15.3.2, 15.4.1  
Boiler and Machinery Insurance  
11.3.2  
Bonds, Lien  
7.3.7.4, 9.10.2, 9.10.3  
Bonds, Performance, and Payment  
7.3.7.4, 9.6.7, 9.10.3, 11.3.9, 11.4  
Building Permit  
3.7.1
Capitalization

1.3 Certificate of Substantial Completion
9.8.3, 9.8.4, 9.8.5

Certificates for Payment
4.2.1, 4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7.1,
9.10.1, 9.10.5, 14.1.13, 14.2.4, 15.1.3

Certificates of Inspection, Testing or Approval
15.5.4

Certificates of Insurance
9.10.2, 11.1.3

Change Orders
1.1.1, 2.4.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11.1, 3.12.8, 4.2.8,
5.2.3, 7.1.2, 7.1.3, 7.2, 7.3.2, 7.3.6, 7.3.9, 7.3.10, 8.3.1,
9.3.1.1, 9.10.3, 10.3.2, 11.3.1.2, 11.3.4, 11.3.9, 12.1.2,
15.1.3

Change Orders, Definition of
7.2.1

CHANGES IN THE WORK
2.2.1, 3.11, 4.2.8, 7, 7.2.1, 7.3.1, 7.4, 7.4.1, 8.3.1,
9.3.1.1, 11.3.9

Claims, Definition of
15.1.1

CLAIMS AND DISPUTES
3.2.4, 6.1.1, 6.3.1, 7.3.9, 9.3.3, 9.10.4, 10.3.3, 15, 15.4
Claims and Timely Assertion of Claims
15.4.1

Claims for Additional Cost
3.2.4, 3.7.4, 6.1.1, 7.3.9, 10.3.2, 15.1.4

Claims for Additional Time
3.2.4, 3.7.4.6.1.1, 8.3.2, 10.3.2, 15.1.5

Concealed or Unknown Conditions, Claims for
3.7.4

Claims for Damages
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1,
11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6

Claims Subject to Arbitration
15.3.1, 15.4.1

Cleaning Up
3.15, 6.3

Commencement of the Work, Conditions Relating to
2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3,
6.2.1, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.3.1, 11.3.6, 11.4.1,
15.1.4

Commencement of the Work, Definition of
8.1.2

Communications Facilitating Contract
Administration
3.9.1, 4.2.4

Completion, Conditions Relating to
3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1,
9.10, 12.2, 13.7, 14.1.2

COMPLETION, PAYMENTS AND
9

Completion, Substantial
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2,
13.7

Compliance with Laws
1.6.1, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4, 10.2.2,
11.1, 11.3, 13.1, 13.4, 13.5.1, 13.5.2, 13.6, 14.1.1,
14.2.1.3, 15.2.8, 15.4.2, 15.4.3

Concealed or Unknown Conditions
3.7.4, 4.2.8, 8.3.1, 10.3

Conditions of the Contract
1.1.1, 6.1.1, 6.1.4

Consent, Written
3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.8.5, 9.9.1,
9.10.2, 9.10.3, 11.3.1, 13.2, 13.4.2, 15.4.4.2

Consolidation or Joinder
15.4.4

CONSTRUCTION BY OWNER OR BY
SEPARATE CONTRACTORS
1.1.4, 6

Construction Change Directive, Definition of
7.3.1

Construction Change Directives
1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, 7.3,
9.3.1.1

Construction Schedules, Contractor's
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2

Contingent Assignment of Subcontracts
5.4, 14.2.2.2

Continuing Contract Performance
15.1.3

Contract, Definition of
1.1.2

CONTRACT, TERMINATION OR
SUSPENSION OF THE
5.4.1.1, 11.3.9, 14

Contract Administration
3.1.3, 4, 9.4, 9.5

Contract Award and Execution, Conditions Relating to
3.7.1, 3.10, 5.2, 6.1, 11.1.3, 11.3.6, 11.4.1

Contract Documents, The
1.1.1

Contract Documents, Copies Furnished and Use of
1.5.2, 2.2.5, 5.3

Contract Documents, Definition of
1.1.1

Contract Sum
3.7.4, 3.8, 5.2.3, 7.2, 7.3, 7.4, 9.1, 9.4.2, 9.5.1.4, 9.6.7,
9.7, 10.3.2, 11.3.1, 14.2.4, 14.3.2, 15.1.4, 15.2.5

Contract Sum, Definition of
9.1

Contract Time
3.7.4, 3.7.5, 3.10.2, 5.2.3, 7.2.1.3, 7.3.1, 7.3.5, 7.4,
8.1.1, 8.2.1, 8.3.1, 9.5.1, 9.7.1, 10.3.2, 12.2.1, 14.3.2,
15.1.5.1, 15.2.5

Contract Time, Definition of
8.1.1

CONTRACTOR
3

Contractor, Definition of

3.1, 6.1.2
Contractor's Construction Schedules
3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2
Contractor's Employees
3.3.2, 3.4.3, 3.8, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3,
11.1.1, 11.3.7, 14.1, 14.2.1.1,
Contractor's Liability Insurance
11.1
Contractor's Relationship with Separate Contractors
and Owner's Forces
3.12.5, 3.14.2, 4.2.4, 6, 11.3.7, 12.1.2, 12.2.4
Contractor's Relationship with Subcontractors
12.2.2, 3.3.2, 3.18.1, 3.18.2, 5, 9.6.2, 9.6.7, 9.10.2,
11.3.1.2, 11.3.7, 11.3.8
Contractor's Relationship with the Architect
1.1.2, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5.1,
3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.3, 4.2, 5.2, 6.2.2,
7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3,
11.3.7, 12, 13.5, 15.1.2, 15.2.1
Contractor's Representations
3.2.1, 3.2.2, 3.5.1, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2
Contractor's Responsibility for Those Performing the Work
3.3.2, 3.18, 5.3.1, 6.1.3, 6.2, 9.5.1, 10.2.8
Contractor's Review of Contract Documents
3.2
Contractor's Right to Stop the Work
9.7
Contractor's Right to Terminate the Contract
14.1, 15.1.6
Contractor's Submittals
3.10, 3.11, 3.12.4, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2,
9.8.3, 9.9.1, 9.10.2, 9.10.3, 11.1.3, 11.4.2
Contractor's Superintendent
3.9, 10.2.6
Contractor's Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3,
7.3.5, 7.3.7, 8.2, 10, 12, 14, 15.1.3
Contractual Liability Insurance
11.1.1.8, 11.2
Coordination and Correlation
1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1
Copies Furnished of Drawings and Specifications
1.5, 2.2.5, 3.11
Copyrights
1.5, 3.17
Correction of Work
2.3, 2.4, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, 12.2
Correlation and Intent of the Contract Documents
1.2
Cost, Definition of
7.3.7
Costs
2.4.1, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3,
7.3.3.3, 7.3.7, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.3,
12.1.2, 12.2.1, 12.2.4, 13.5, 14
Cutting and Patching
3.14, 6.2.5
Damage to Construction of Owner or Separate Contractors
3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 11.1.1, 11.3,
12.2.4
Damage to the Work
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4.1, 11.3.1, 12.2.4
Damages, Claims for
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1,
11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6
Damages for Delay
6.1.1, 8.3.3, 9.5.1.6, 9.7, 10.3.2
Date of Commencement of the Work, Definition of
8.1.2
Date of Substantial Completion, Definition of
8.1.3
Day, Definition of
8.1.4
Decisions of the Architect
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 15.2, 6.3,
7.3.7, 7.3.9, 8.1.3, 8.3.1, 9.2.1, 9.4, 9.5.1, 9.8.4, 9.9.1,
13.5.2, 14.2.2, 14.2.4, 15.1.1, 15.2
Decisions to Withhold Certification
9.4.1, 9.5, 9.7, 14.1.1.3
Defective or Nonconforming Work, Acceptance,
Rejection and Correction of
2.3.1, 2.4.1, 3.5.1, 4.2.6, 6.2.5, 9.5.1, 9.5.2, 9.6.6,
9.8.2, 9.9.3, 9.10.4, 12.2.1
Defective Work, Definition of
3.5.1
Definitions
1.1, 2.1.1, 3.1.1, 3.5.1, 3.12.1, 3.12.2, 3.12.3, 4.1.1,
15.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1
Delays and Extensions of Time
3.2., 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4.1, 8.3, 9.5.1, 9.7.1,
10.3.2, 10.4.1, 14.3.2, 15.1.5, 15.2.5
Disputes
6.3.1, 7.3.9, 15.1, 15.2
Documents and Samples at the Site
3.11
Drawings, Definition of
1.1.5
Drawings and Specifications, Use and Ownership of
3.11
Effective Date of Insurance
8.2.2, 11.1.2
Emergencies
10.4, 14.1.1.2, 15.1.4
Employees, Contractor's
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2,
10.3.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1
Equipment, Labor, Materials or
1.1.3, 1.1.6, 3.4, 3.5.1, 3.8.2, 3.8.3, 3.12, 3.13.1,
3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3,
9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Execution and Progress of the Work
1.3, 1.2.1, 1.2.2, 2.2.3, 2.2.5, 3.1, 3.3.1, 3.4.1, 3.5.1, 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.5, 8.2, 9.5.1, 9.9.1, 10.2, 10.3, 12.2, 14.2, 14.3.1, 15.1.3 Extensions of Time 10.4.1, 14.5, 15.1.5, 15.2.5 Failure of Payment 9.5.1.3, 9.7, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2 Faulty Work (See Defective or Nonconforming Work) Financial Arrangements, Owner’s 2.2.1, 13.2.2, 14.1.1.4 Insurance, Contractor’s Liability 11.1 Insurance, Effective Date of 8.2.2, 11.1.2 Insurance, Loss of Use 11.3.3 Insurance, Owner’s Liability 11.2 Insurance, Property 10.2.5, 11.3 Insurance, Stored Materials 9.3.2, 11.4.1.4 INSURANCE AND BONDS 11 Insurance Companies, Consent to Partial Occupancy 9.9.1, 11.4.1.5 Insurance Companies, Settlement with 11.4.10 Intent of the Contract Documents 1.2.1, 4.2.7, 4.2.12, 4.2.13, 7.4 Interest 13.6 Interpretation 1.2.3, 1.4, 4.1.1, 5.1, 6.1.2, 15.1.1 Interpretations, Written 4.2.11, 4.2.12, 15.1.4 Judgment on Final Award 15.4.2 Labor and Materials, Equipment 1.1.3, 1.1.6, 3.4, 3.5.1, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2 Labor Disputes 8.3.1 Laws and Regulations 1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13.1, 4.1.1, 4.9.6, 9.9.1, 10.2.2, 11.1.1, 11.3, 13.1.1, 13.4, 13.5.1, 13.5.2, 13.6.1, 14, 15.2.8, 15.4 Liens 2.1.2, 9.3.3, 9.10.2, 9.10.4, 15.2.8 Limitations, Statutes of 12.2.5, 13.7, 15.4.1.1 Limitations of Liability 2.3.1, 3.2.2, 3.5.1, 3.12.10, 3.17.1, 3.18.1, 4.2.6, 4.2.7, 4.2.12, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 10.2.5, 10.3.3, 11.1.2, 11.2.1, 11.3.7, 12.2.5, 13.4.2 Limitations of Time 2.1.2, 2.2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7, 5.2, 5.3.1, 5.4.1, 6.2.4, 7.3, 7.4.8, 9.2.1, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7.1, 9.8, 9.9, 9.10, 11.1.3, 11.3.1.5, 11.3.6, 11.3.10, 12.2, 13.5, 13.7, 14, 15 Loss of Use Insurance 11.3.3 Material Suppliers 1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.6, 9.10.5 Materials, Hazardous 10.2.4, 10.3
Materials, Labor, Equipment and  
1.1.3, 1.1.6, 1.5.1, 3.4.1, 3.5.1, 3.8.2, 3.8.3, 3.12,  
3.13.1, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2,  
9.3.3, 9.5.1.3, 9.10.2, 10.2.1.2, 10.2.4, 14.2.1.1,  
14.2.1.2  
Means, Methods, Techniques, Sequences and  
Procedures of Construction  
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2  
Mechanic’s Lien  
2.1.2, 15.2.8  
Mediation  
8.3.1, 10.3.5, 10.3.6, 15.2.1, 15.2.5, 15.2.6, 15.3,  
15.4.1  
Minor Changes in the Work  
1.1.1, 3.12.8, 4.2.8, 7.1, 7.4  
MISCELLANEOUS PROVISIONS  
13  
Modifications, Definition of  
1.1.1  
Modifications to the Contract  
1.1.1, 1.1.2, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7.1,  
10.3.2, 11.3.1  
Mutual Responsibility  
6.2  
Nonconforming Work, Acceptance of  
9.6.6, 9.9.3, 12.3  
Nonconforming Work, Rejection and Correction of  
2.3.1, 2.4.1, 3.5.1, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3,  
9.10.4, 12.2.1  
Notice  
2.2.1, 2.3.1, 2.4.1, 3.2.4, 3.3.1, 3.7.2, 3.12.9, 5.2.1,  
9.7.1, 9.10, 10.2.2, 11.1.3, 11.4.6, 12.2.2.1, 13.3,  
13.5.1, 13.5.2, 14.1, 14.2, 15.2.8, 15.4.1  
Notice, Written  
2.3.1, 2.4.1, 3.3.1, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 9.7.1,  
9.10, 10.2.2, 10.3, 11.1.3, 11.3.6, 12.2.2.1, 13.3, 14,  
15.2.8, 15.4.1  
Notice of Claims  
3.7.4, 4.5, 10.2.8, 15.1.2, 15.4  
Notice of Testing and Inspections  
13.5.1, 13.5.2  
Observations, Contractor’s  
3.2, 3.7.4  
Occupancy  
2.2.2, 9.6.6, 9.8, 11.3.1.5  
Orders, Written  
1.1.1, 2.3, 3.9.2, 7, 8.2.2, 11.3.9, 12.1, 12.2.2.1, 13.5.2,  
14.3.1  
OWNER  
2  
Owner, Definition of  
2.1.1  
Owner, Information and Services Required of the  
2.1.2, 2.2, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2,  
9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2.1, 11.3, 13.5.1,  
13.5.2, 14.1.1.4, 14.1.4, 15.1.3  
Owner’s Authority  
1.5, 2.1.1, 2.3.1, 2.4.1, 3.4.2, 3.8.1, 3.12.10, 3.14.2,  
4.1.2, 4.1.3, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3.1,  
7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.1, 9.3.2, 9.5.1, 9.6.4,  
9.9.1, 9.10.2, 10.3.2, 11.1.3, 11.3.3, 11.3.10, 12.2.2,  
12.3.1, 13.2.2, 14.3, 14.4, 15.2.7  
Owner’s Financial Capability  
2.2.1, 13.2.2, 14.1.1.4  
Owner’s Liability Insurance  
11.2  
Owner’s Loss of Use Insurance  
11.3.3  
Owner’s Relationship with Subcontractors  
1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2  
Owner’s Right to Carry Out the Work  
2.4, 14.2.2  
Owner’s Right to Clean Up  
6.3  
Owner’s Right to Perform Construction and to  
Award Separate Contracts  
6.1  
Owner’s Right to Stop the Work  
2.3  
Owner’s Right to Suspend the Work  
14.3  
Owner’s Right to Terminate the Contract  
14.2  
Ownership and Use of Drawings, Specifications  
and Other Instruments of Service  
1.1.1, 1.1.6, 1.1.7, 1.5, 2.2.5, 3.2.2, 3.11.1, 3.17.1,  
4.2.12, 5.3.1  
Partial Occupancy or Use  
9.6.6, 10.9, 11.3.1.5  
Patching, Cutting and  
3.14, 6.2.5  
Patents  
3.17  
Payment, Applications for  
4.2.5, 7.3.9, 9.2.1, 9.3, 9.4, 9.5, 9.6.3, 9.7.1, 9.8.5,  
9.10.1, 14.2.3, 14.2.4, 14.4.3  
Payment, Certificates for  
4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7.1, 9.10.1,  
9.10.3, 13.7, 14.1.1.3, 14.2.4  
Payment, Failure of  
9.5.1.3, 9.7, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2  
Payment, Final  
4.2.1, 4.2.9, 9.8.2, 9.10, 11.1.2, 11.1.3, 11.4.1, 11.4.5,  
12.3.1, 13.7, 14.2.4, 14.4.3  
Payment Bond, Performance Bond and  
7.3.7.4, 9.6.7, 9.10.3, 11.4.9, 11.4  
Payments, Progress  
9.3, 9.6, 9.8.5, 9.10.3, 13.6, 14.2.3, 15.1.3  
PAYMENTS AND COMPLETION  
9  
Payments to Subcontractors  
5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 11.4.8,  
14.2.1.2  
PCB
3.17
Rules and Notices for Arbitration
15.4.1
Safety of Persons and Property
10.2, 10.4
Safety Precautions and Programs
3.1.1, 4.2.2, 4.2.7, 5.3.1, 10.1, 10.2, 10.4
Samples, Definition of 3.12.3
Samples, Shop Drawings, Product Data and
3.11, 3.12, 4.2.7
Samples at the Site, Documents and
3.11
Schedule of Values
9.2, 9.3.1
Schedules, Construction
1.4.1.2, 3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2
Separate Contracts and Contractors
1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 11.4.7, 12.1.2
Shop Drawings, Definition of 3.12.1
Shop Drawings, Product Data and Samples
3.11, 3.12, 4.2.7
Site, Use of
3.13, 6.1.1, 6.2.1
Site Inspections
3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.4.2, 9.10.1, 13.5
Site Visits, Architect's
3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5
Special Inspections and Testing
4.2.6, 12.2.1, 13.5
Specifications, Definition of the
1.1.6
Specifications, The
1.1.1, 1.1.6, 1.2.2, 1.5, 3.11, 3.12.10, 3.17, 4.2.14
Statute of Limitations
13.7, 15.4.1.1
Stopping the Work
2.3, 9.7, 10.3, 14.1
Stored Materials
6.2.1, 9.3.2, 10.2.1.2, 10.2.4, 11.4.1.4
Subcontractor, Definition of
5.1.1
SUBCONTRACTORS
5
Subcontractors, Work by
1.2.2, 3.3.2, 3.12.1, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2, 9.6.7
Subcontractual Relations
5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 11.4.7, 11.4.8, 14.1, 14.2.1
Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.7, 9.2, 9.3, 9.8, 9.9.1, 9.10.2, 9.10.3, 11.1.3
Submittal Schedule
3.10.2, 3.12.5, 4.2.7
Subrogation, Waivers of
6.1.1, 11.4.5, 11.3.7
Substantial Completion
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 13.7
Substantial Completion, Definition of
9.8.1
Substitution of Subcontractors
5.2.3, 5.2.4
Substitution of Architect
4.1.3
Substitutions of Materials
3.4.2, 3.5.1, 7.3.8
Sub-subcontractor, Definition of
5.1.2
Subsurface Conditions
3.7.4
Successors and Assigns
13.2
Superintendent
3.9, 10.2.6
Supervision and Construction Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3,
7.3.7, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.3
Surety
5.4.1.2, 9.8.5, 9.10.2, 9.10.3, 14.2.2, 15.2.7
Surety, Consent of
9.10.2, 9.10.3
Surveys
2.2.3
Suspension by the Owner for Convenience
14.3
Suspension of the Work
5.4.2, 14.3
Suspension or Termination of the Contract
5.4.1.1, 11.4.9, 14
Taxes
3.6, 3.8.2.1, 7.3.7.4
Termination by the Contractor
14.1, 15.1.6
Termination by the Owner for Cause
5.4.1.1, 14.2, 15.1.6
Termination by the Owner for Convenience
14.4
Termination of the Architect
4.1.3
Termination of the Contractor
14.2.2
TERMINATION OR SUSPENSION OF THE CONTRACT
14
Tests and Inspections
3.1.3, 3.3.3, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2,
9.10.1, 10.3.2, 11.4.1.1, 12.2.1, 13.5
TIME
8
Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4.1, 8.3, 9.5.1, 9.7.1,
10.3.2, 10.4.1, 14.3.2, 15.1.5, 15.2.5
Time Limits
2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2,
4.4, 4.5, 5.2, 5.3, 5.4, 6.2.4, 7.5, 7.4, 8.2, 9.2, 9.3.1,
9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3,
11.4.1.5, 11.4.6, 11.4.10, 12.2, 13.5, 13.7, 14, 15.1.2,
15.4
Time Limits on Claims
3.7.4, 10.2.8, 13.7, 15.1.2
Title to Work
9.3.2, 9.3.3
Transmission of Data in Digital Form
1.6
UNCOVERING AND CORRECTION OF WORK
12
Uncovering of Work
12.1
Unforeseen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3
Unit Prices
7.3.3.2, 7.3.4
Use of Documents
1.1.1, 1.5, 2.2.5, 3.12.6, 5.3
Use of Site
3.13, 6.1.1, 6.2.1
Values, Schedule of
9.2, 9.3.1
Waiver of Claims by the Architect
13.4.2
Waiver of Claims by the Contractor
9.10.5, 11.4.7, 13.4.2, 15.1.6
Waiver of Claims by the Owner
9.9.3, 9.10.3, 9.10.4, 11.4.3, 11.4.5, 11.4.7, 12.2.2.1,
13.4.2, 14.2.4, 15.1.6
Waiver of Consequential Damages
14.2.4, 15.1.6
Waiver of Licenses
9.10.2, 9.10.4
Waivers of Subrogation
6.1.1, 11.4.5, 11.3.7
Warranty
3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.4, 12.2.2, 13.7.1
Weather Delays
15.1.5.2
Work, Definition of
1.1.3
Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.12, 9.3.2, 9.8.5,
9.9.1, 9.10.2, 9.10.3, 11.4.1, 13.2, 13.4.2, 15.4.4.2
Written Interpretations
4.2.11, 4.2.12
Written Notice
2.3, 2.4, 3.3.1, 3.9, 3.12.9, 3.12.10, 5.2.1, 8.2.2, 9.7,
9.10, 10.2.2, 10.3, 11.1.3, 11.4.6, 12.2.2, 12.2.4, 13.3,
14, 15.4.1
Written Orders

Init.
1.1.1, 2.3, 3.9, 7, 8.2.2, 11.4.9, 12.1, 12.2, 13.5.2, 14.3.1, 15.1.2
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 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 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS
§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.
§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

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

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

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

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

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

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

ARTICLE 2 OWNER
§ 2.1 GENERAL
§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing 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 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner’s obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner’s ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the
portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

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

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

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

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

§ 2.3 OWNER’S RIGHT TO STOP THE WORK
If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or 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.

§ 2.4 OWNER’S RIGHT TO CARRY OUT THE WORK
If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner’s expenses and compensation for the Architect’s additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR
§ 3.1 GENERAL
§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor’s authorized representative.

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

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect’s administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.
§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor’s review is made in the Contractor’s capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 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 make claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for 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, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and 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 written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required 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 authorized by the Architect in accordance with Sections 3.12.8 or 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
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.

§ 3.6 TAXES
The Owner will provide the contractor with a project specific sales tax exemption certificate from the State of Kansas. All other 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. There is no building permit fee for this project.

§ 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 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall

Init. /
continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,
1. allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
2. Contractor’s costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
3. whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor’s costs under Section 3.8.2.2.

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

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

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

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

§ 3.10 CONTRACTOR’S CONSTRUCTION SCHEDULES
§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner’s and Architect’s information a Contractor’s construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

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

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

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE
The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required
submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

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

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

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

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

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

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

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

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

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

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop...
Drawings and other submittals prepared by such professional. 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, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

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

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

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

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

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

§ 3.16 ACCESS TO WORK
The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

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

§ 3.18 INDEMNIFICATION
§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (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 which would otherwise exist as to a party or person described in this Section 3.18.

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

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

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

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

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

§ 4.2 ADMINISTRATION OF THE CONTRACT

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

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

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

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

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

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed.
However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor’s submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect’s action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect’s professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect’s review of the Contractor’s submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect’s review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, 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 authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

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

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect’s responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 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 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 or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply 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 previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS
By appropriate agreement, written where legally required for validity, 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, which the Contractor, by these 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 in writing; and

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

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor’s rights and obligations under the subcontract.
§ 5.4.2 Upon such assignment, 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 such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall 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 Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

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

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

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

§ 6.2 MUTUAL RESPONSIBILITY

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

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

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

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

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.
§ 6.3 OWNER'S RIGHT TO CLEAN UP
If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

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

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

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

§ 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 7.3.7.

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

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.
§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor’s agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers’ compensation insurance;
.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, 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 related to the Work; and
.5 Additional costs of supervision and field office personnel directly attributable to the change.

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

ARTICLE 8 TIME
§ 8.1 DEFINITIONS
§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

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

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

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

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

§ 8.3 DELAYS AND EXTENSIONS OF TIME
§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor’s control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

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

ARTICLE 9 PAYMENTS AND COMPLETION
§ 9.1 CONTRACT SUM
The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

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

§ 9.3 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. Such application shall be notarized, if required, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material 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 material 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, material suppliers, or other persons or entities making a claim by reason of having 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 issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect’s reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect’s evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect’s knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor’s right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

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

1. defective Work not remedied;
2. third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
3. failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
4. reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
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 the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

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

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

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

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

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

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

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

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

§ 9.7 FAILURE OF PAYMENT
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’ written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 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, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. 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 such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such 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 as required under Section 11.3.1.5 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 written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. 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 and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents.

Init. / AIA Document A201™ – 2007. Copyright © 1911, 1915, 1916, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997 and 2007 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 12:16:30 ET on 12/06/2019 under Order No. 8399417061 which expires on 07/04/2020, and is not for resale. User Notes:
Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys’ fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 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; or
3. terms of special warranties required by the Contract Documents.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

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

§ 10.2 SAFETY OF PERSONS AND PROPERTY

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

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

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

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

§ 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, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor’s obligations under Section 3.18.

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

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

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

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

§ 10.3.2 Upon receipt of the Contractor’s written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. 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 in the amount of the Contractor’s reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect’s consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor’s fault or negligence in the use and handling of such materials or substances.
§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner’s fault or negligence.

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

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

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 CONTRACTOR’S LIABILITY INSURANCE
§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor’s operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers’ compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor’s employees;
.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor’s employees;
.4 Claims for damages insured by usual personal injury liability coverage;
.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
.7 Claims for bodily injury or property damage arising out of completed operations; and
.8 Claims involving contractual liability insurance applicable to the Contractor’s obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor’s completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect’s Consultants as additional insureds for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s operations; and (2) the Owner as an
additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 OWNER'S LIABILITY INSURANCE
The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE
§ 11.3.1 Unless otherwise provided, the contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

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

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

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

§ 11.3.3 LOSS OF USE INSURANCE
The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.
§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 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, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION
The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

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

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

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

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND
§ 11.4.1 The Owner will not 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. In lieu of bonding the owner will make progress payments during
the course of the work, less 10% retainage, and will require releases of lien to be provide for each payment received. A separate release shall be provide for the total amount from the general contractor, and separate releases from each sub-contractor and material supplier payments were made to by the general contractor. The final 15% of the contract amount, plus the previously withheld retainage, will be withheld until the project is completed and accepted by the owner and architect.

§ 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.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK
§ 12.1 UNCOVERING OF WORK
§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

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

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

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION
§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

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

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

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

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.
§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor’s liability with respect to the Contractor’s obligations other than specifically to correct the Work.

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

ARTICLE 13 MISCELLANEOUS PROVISIONS
§ 13.1 GOVERNING LAW
The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

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

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

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

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

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

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

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or
approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner’s expense.

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

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

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

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

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

§ 13.7 TIME LIMITS ON CLAIMS
The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time 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 13.7.

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 or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

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

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

.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 promptly, upon the Contractor’s request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, 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' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with
the Contractor because the Owner has repeatedly failed to fulfill the Owner’s obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days’ written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

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

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor’s surety, if any, seven days’ written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

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

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

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

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

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

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

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

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

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

1. cease operations as directed by the Owner in the notice;
2. take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
3. except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.
§ 14.4.3 In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES
§ 15.1 CLAIMS
§ 15.1.1 DEFINITION
A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS
Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the 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 must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

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

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

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

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, 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.

§ 15.1.6 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 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION
§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the 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 arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no 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 such 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.

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

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

§ 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 15.1.6 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 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.
16.1 INSURANCE REQUIREMENTS:

16.1.1 Liability insurance shall include all major divisions of coverage and be on a comprehensive basis including:
  1. Premises Operations (including X,C, and U coverage as applicable)
  2. Independent Contractor.
  5. Contractual, including specified provisions for Contractor's obligation under Paragraph 3.12.
  6. Broad Form Property Damage including Completed Operations.

16.1.2 The General Liability coverage will be provided on an occurrence basis. The General Liability Completed Operations coverage must remain in force for three (3) years following the completion of the project.

16.1.3 The insurance requirements shall be written for not less than the following limits, unless required to be greater by law:

  1. **Workers’ Compensation:**
     - **State:** Statutory
     - **Applicable Federal:** Statutory
     - **Employer’s Liability:** $1,000,000 Each Person or Statutory which ever is greater
     - **Benefits Required by Union Contracts as applicable.**
  2. **Comprehensive or Commercial General Liability with limits of $1,000,000 Per Occurrence and $2,000,000 Aggregate are required.**
  3. **Business Auto Liability (including owned, non-owned and hired vehicles) with limits of $1,000,000 is required.**

  Note: State of Kansas has a no-fault automobile insurance requirement. The Contractor shall be certain coverage is provide which conforms to any specific stipulations in the law.

16.1.4 The contractor shall carry an Excess Umbrella coverage of $1,000,000 for the project.

16.1.5 Settlement of Insurance Claims: Losses insured under policies that include OWNER as a named insured shall be adjusted with OWNER and made payable to OWNER as trustee for the insured, as their interest may appear. OWNER and CONTRACTOR waive all right against each other for damages caused by fire or other perils to the extent covered by insurance, except such rights as they may have to insurance proceeds held by OWNER as trustee. CONTRACTOR shall require similar waivers by Subcontractors as provide in the General Conditions.

16.4 Liquidated Damages in the amount of $100 per calendar day for each day the work continues beyond the contract time defined on the bid form, and as modified as part of the owner contractor agreement, until the work is determined substantially complete by the Architect, will apply to the contract amount.

16.5 The builders risk insurance from the project shall be carried by the contractor.

16.6 Kansas Acts against Discrimination shall be a part of all contracts on this project.
Statute 44-1030: State and local government contracts, mandatory provisions.(a) Except as provided by subsection (c), every contract for or on behalf of the state or any county or municipality or other political subdivision of the state, or any agency of or authority created by any of the foregoing, for the construction, alteration or repair of any public building or public work or for the acquisition of materials, equipment, supplies or services which shall contain provisions by which the contractor agrees that:
(1) The contractor shall observe the provisions of the Kansas act against discrimination and shall not discriminate against any person in the performance of work under the present contract because of race, religion, color, sex, disability, national origin or ancestry;
(2) in all solicitations or advertisements for employees, the contractor shall include the phrase, "equal opportunity employer," or a similar phrase to be approved by the commission;
(3) if the contractor fails to comply with the manner in which the contractor reports to the commission in accordance with the provisions of K.S.A. 44-1031 and amendments thereto, the contractor shall be deemed to have breached the present contract and it may be canceled, terminated or suspended, in whole or in part, by the contracting agency;
(4) if the contractor is found guilty of a violation of the Kansas act against discrimination under a decision or order of the commission which has become final, the contractor shall be deemed to have breached the present contract and it may be canceled, terminated or suspended, in whole or in part, by the contracting agency; and
(5) the contractor shall include the provisions of subsections (a)(1) through (4) in every subcontract or purchase order so that such provisions will be binding upon such subcontractor or vendor.
(b) The Kansas human rights commission shall not be prevented hereby from requiring reports of contractors found to be not in compliance with the Kansas act against discrimination.
(c) The provisions of this section shall not apply to a contract entered into by a contractor:
(1) Who employs fewer than four employees during the term of such contract; or
(2) whose contracts with the governmental entity letting such contract cumulatively total $5,000 or less during the fiscal year of such governmental entity.

END OF GENERAL CONDITIONS

(Paragraphs deleted)
SECTION 01100 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Work covered by the Contract Documents.
   2. Work phases.
   3. Work under other contracts.
   4. Use of premises.
   5. Owner's occupancy requirements.

B. See Division 1 Section "Summary of Multiple Contracts" for division of responsibilities for the Work.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Barton Community College Camp Aldrich Trails Cabin Project
   1. Project Location: 884 NE 110th Ave / Claflin, KS 67525

B. Owner: Barton Community College
   1. Owner's Representative: Mark Dean

C. Architect: DMA Architects, PA / 3025 E. Iron #100 / Salina, Kansas 67401

D. The Work consists: The demolition of the existing cabin next to the site and the demolition of the cabin northwest of the conference center which was destroyed by fire. The construction of a slab on grade pre-engineered metal building to house the new Trails Cabin Bunk House.

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

1.3 WORK PHASES

A. The Work shall be conducted in one phase

1.4 WORK UNDER OTHER CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.
1.5 USE OF PREMISES

A. General: Contractor shall will have full use of the sites during construction. Temporary fencing and barricades shall be installed by the contractor to limit access to the construction areas.

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

1. Limits: Confine constructions operations to the work area so as to allow the owner use of the existing building during the construction according to the phasing listed above.

2. Driveways and Entrances: Keep driveways parking lot and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

1.6 OWNER'S OCCUPANCY REQUIREMENTS

A. No Owner Occupancy will occur on the project site other than what is required to allow the owner and the owner’s separate contractors to do their work as it relates to the project and the college campus

1.7 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "Master Format" numbering system.

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

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

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

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01100
SECTION 01210 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements governing the following:

1. Lump-sum allowances.

B. See Division 1 Section "Unit Prices" for procedures for using unit prices.

C. See Division 1 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.2 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.3 SUBMITTALS

A. specified for Change Orders.

B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.4 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.5 LUMP-SUM UNIT-COST AND QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner under allowance and shall include taxes, freight, and delivery to Project site.
B. Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.6 UNUSED MATERIALS

A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Architect, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

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

3.3 SCHEDULE OF ALLOWANCES

Allowance #1: Building Hardware: An allowance of $25,000 shall be included in the contractor's base bid for all building hardware required of the project, including but not limited to door hinges, latches and locks, door accessories, display case operable window hinges, latches and accessories. The labor to install, and related materials shall be included in the Base Bid. This allowance is for the hollow metal doors and frames only. The hardware for the aluminum storefront and sliding aluminum doors shall be bid as part of the aluminum door specification. Justification of this allowance shall be based on the invoice cost of the hardware from the hardware supplier. The contractor and all related subcontractor markups shall be included in the base bid.

Allowance #2: Soil and Concrete Testing: An allowance of $10,000 shall be included in the contractors base bid for all soil and concrete testing required for the project. The contractor shall coordinate the work of the owner approved testing lab for the required soil and concrete testing...
services for the project. The contractor shall provide monthly accounting for the testing services completed during the previous month which will be charged against this allowance.

END OF SECTION 01210
SECTION 01230 – ALTERNATES / UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY
A. This Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS
A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from 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 or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

2. Unit Prices is the cost for the added work as defined under each unit price.

1.3 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.
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

**ALTERNATE BID #1 Exterior Wall Construction Alternate:** Provide the difference in cost of labor and materials to complete the work defined on the project bid documents for the exterior wall structural metal stud, insulation, liner panel, exterior sheeting, and exterior shingle siding and trim in lieu of the base bid metal building liner panel, wall girts, simple saver insulation, and exterior metal panel wall finish. The additional cost to extend the overhang across this roof area under the base bid conditions shall be deducted from the cost of this alternate bid.

END OF SECTION 01230
SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

B. See Division 1 Section "Allowances / Unit Prices" for procedural requirements for handling and processing allowances and Unit Prices.

1.2 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on the architect's field report form.

1.3 PROPOSAL REQUESTS

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

   1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.

   2. Within seven days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

      a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.

      b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

      c. Include costs of labor and supervision directly attributable to the change.

      d. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

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

   1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.


1.4 ALLOWANCES
A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
   1. Include installation costs in purchase amount only where indicated as part of the allowance.
   2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within 7 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Owner will reject claims submitted later than 21 days after such authorization.
   1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
   2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.5 UNIT PRICES
A. Unit Price: To adjust unit, multiplied by final measurement of work-in-place.
1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701. Maximum contractor mark up will be 5% for overhead and 10% for profit.

1.7 CONSTRUCTION CHANGE DIRECTIVE


   1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

   1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01250
SECTION 01290 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

B. The owner will require specific items to be billed separately on the payment application. Those items are the code upgrade items which will be defined at the time the contract break down is being prepared by the contractor who is under consideration for the contract award.

1.2 SCHEDULE OF VALUES

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

   1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Application for Payment forms with Continuation Sheets.
   2. Submit the Schedule of Values to Architect at earliest possible date but no later than 14 days before the date scheduled for submittal of initial Applications for Payment.
   3. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
   4. The contractor will be required to include line items in the schedule of values for pricing information required by the owner’s insurance company so that the owner may receive reimbursement for those items as part of the project. The owner and architect will define the items related to code upgrades, demolition, including the fire sprinkler system and fire alarm system cost.

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

   1. Identification: Include the following Project identification on the Schedule of Values:
      a. Project name and location.
      b. Name of Architect.
      c. Architect's project number.
      d. Contractor's name and address.
      e. Date of submittal.

   2. Submit draft of AIA Document G703 Continuation Sheets.
   3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
   4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

6. Provide separate line items in the Schedule of Values for initial cost of materials and labor, for each subsequent stage of completion, and for total installed value of that part of the Work.

7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

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

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

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

C. Payment Application Times: Progress payments shall be submitted to Architect by the 1st of the month. The period covered by each Application for Payment is one month, ending on the last day of the previous month.


E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

   1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
   2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
   3. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours.
F. Waivers of Mechanic's Lien: With the final Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

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

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Schedule of unit prices.
5. Submittals Schedule (preliminary if not final).
6. List of Contractor's staff assignments.
7. List of Contractor's principal consultants.
10. Initial progress report.
12. Certificates of insurance and insurance policies.

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

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

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

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01290
SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

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

1. Coordination Drawings.
2. Project meetings.
3. Requests for Interpretation (RFIs).

B. See Division 1 Section "Summary of Multiple Contracts" for a description of the division of Work among separate contracts and responsibility for coordination activities not in this Section.

C. See Division 1 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 DEFINITIONS

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

1.3 COORDINATION

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

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 with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

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

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

1.4 SUBMITTALS

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

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

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

2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 24 by 36 inches.
3. Number of Copies: Submit at least 5 opaque copies of each submittal. Architect will return one copy.
4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.

1.5 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. **Attendees:** Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.

2. **Agenda:** Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. **Minutes:** Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within seven days of the meeting.

**B. Preconstruction Conference:** Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

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

2. **Agenda:** Discuss items of significance that could affect progress, including the following:
   a. Tentative construction schedule.
   b. Phasing.
   c. Critical work sequencing and long-lead items.
   d. Designation of key personnel and their duties.
   e. Procedures for processing field decisions and Change Orders.
   f. Procedures for RFIs.
   g. Procedures for testing and inspecting.
   h. Procedures for processing Applications for Payment.
   i. Distribution of the Contract Documents.
   j. Submittal procedures.
   k. Preparation of Record Documents.
   l. Use of the premises and existing building.
   m. Work restrictions.
   n. Owner's occupancy requirements.
   o. Responsibility for temporary facilities and controls.
   q. Parking availability.
   r. Office, work, and storage areas.
   s. Equipment deliveries and priorities.
   t. First aid.
   u. Security.
   v. Progress cleaning.
   w. Working hours.

3. **Minutes:** Architect will record and distribute meeting minutes.

**C. Pre-installation Conferences:** Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.

1. **Attendees:** Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and
installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.

2. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

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

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

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

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

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

   1) Review schedule for next period.

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

   1) Interface requirements.
   2) Sequence of operations.
   3) Status of submittals.
   4) Deliveries.
   5) Off-site fabrication.
   6) Access.
   7) Site utilization.
   8) Temporary facilities and controls.
   9) Work hours.
   10) Hazards and risks.
   11) Progress cleaning.
   12) Quality and work standards.
   13) Status of correction of deficient items.
   14) Field observations.
   15) RFIs.
   16) Status of proposal requests.
   17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.

3. Minutes: Architect will record and distribute to Contractor the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

   a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

1.6 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, the architect’s response to RFI’s will be included in the architects field report.

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310
SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

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

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

B. See Division 1 Section "Summary of Multiple Contracts" for preparing a combined Contractor's Construction Schedule.

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

D. See Division 1 Section "Photographic Documentation" for submitting construction photographs.

1.2 DEFINITIONS

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

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

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

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

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

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

E. Fragment: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
F. Major Area: A story of construction, a separate building, or a similar significant construction element.

1.3 SUBMITTALS

A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

B. Daily Construction Reports: Keep log at job site for review by the owner and architect. No submittal is required. Provide copies to the owner and architect upon request.

C. Field Condition Reports: Keep log at job site for review by the owner and architect. No submittal is required. Provide copies to the owner and architect upon request.

1.4 COORDINATION

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

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

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

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

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

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Submit concurrently with the first complete submittal of Contractor's Construction Schedule.
2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for commencement of the Work to date of Final Completion.

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

B. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than 10 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.
3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
4. Work Restrictions: Show the effect of the following items on the schedule:
   a. Coordination with existing construction.
   b. Limitations of continued occupancies.
   c. Uninterruptible services.
   d. Partial occupancy before Substantial Completion.
   e. Use of premises restrictions.
   g. Seasonal variations.
   h. Environmental control.
5. Work Stages: Indicate important stages of construction for each major portion of the Work.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for commencement of the Work. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.4 REPORTS

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

1. List of subcontractors at Project site.
2. Equipment at Project site.
3. Material deliveries.
4. High and low temperatures and general weather conditions.
5. Accidents.
7. Meter readings and similar recordings.
8. Orders and requests of authorities having jurisdiction.
9. Services connected and disconnected.
10. Equipment or system tests and startups.

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

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule the first weekly progress meeting of the month.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.

3. As the Work progresses, indicate Actual Completion percentage for each activity.

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

1. Post copies in Project meeting rooms and temporary field offices.

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

END OF SECTION 01320
SECTION 01322 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for the following:
   1. Preconstruction photographs.
   2. Periodic construction photographs. Digital Pictures will be acceptable, e-mail as a delivery method.

B. See Division 1 Section "Closeout Procedures" for submitting digital media as Project Record Documents at Project closeout.

C. See Division 1 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.

1.2 SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same label information as corresponding set of photographs.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in uncompressed TIFF format, produced by a cell phone is acceptable.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. E-mail a maximum of 20 pictures on a weekly basis to the architect which take into account the work that was completed during the week.

END OF SECTION 01322
SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

B. See Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule.

C. See Division 1 Section "Photographic Documentation" for submitting construction photographs.

D. See Division 1 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.

E. See Division 1 Section "Closeout Procedures" for submitting warranties.

F. See Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

G. See Division 1 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.

H. See Division 1 Section "Demonstration and Training" for submitting videotapes of demonstration of equipment and training of Owner's personnel.

1.2 DEFINITIONS

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

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

1.3 SUBMITTAL PROCEDURES

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

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

2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

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

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

1. Initial Review: Allow 7 days for initial review of each submittal. (14 days for mechanical and electrical) 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. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 7 days for review of each resubmittal.

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

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 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.
3. Include the following information on label for processing and recording action taken:

   a. Project name.
   b. Date.
   c. Name and address of Architect.
   d. Name and address of Contractor.
   e. Name and address of subcontractor.
   f. Name and address of supplier.
   g. Name of manufacturer.
   h. Submittal number or other unique identifier, including revision identifier.

   1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).

   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.

E. Deviations: Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.
F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.

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

1. Transmittal Form: Use contractor’s standard form.

H. 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.

I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

J. Use for Construction: Use only final submittals with mark indicating "Reviewed, or reviewed as noted" taken by Architect.

1.4 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

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

1. The architectural existing building floor plan files and reflected ceiling files will be provided in an auto-cad exploded format. Consultants files will be released if approved by the consultant.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

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

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

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Manufacturer's catalog cuts.
e. Wiring diagrams showing factory-installed wiring.
f. Printed performance curves.
g. Operational range diagrams.
h. Compliance with specified referenced standards.
i. Testing by recognized testing agency.

4. Number of Copies: Submit number of copies required of the project of Product Data. Architect will keep 1 copy. Mark up and retain one returned copy as a Project Record Document.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Dimensions.
   b. Identification of products.
   c. Fabrication and installation drawings.
   d. Roughing-in and setting diagrams.
   e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
   f. Shopwork manufacturing instructions.
   g. Templates and patterns.
   h. Schedules.
   i. Notation of coordination requirements.
   j. Notation of dimensions established by field measurement.
   k. Relationship to adjoining construction clearly indicated.
   l. Seal and signature of professional engineer if specified.
   m. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

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 but no larger than 24 by 36 inches.

3. Number of Copies: Submit number of copies required of the project of Product Data. Architect will keep 1 copy. Mark up and retain one returned copy as a Project Record Document.

D. 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 appropriate Specification Section.

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.

4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

   a. Number of Samples: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return written selection of sample, no samples will be returned.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location.

   1. Number of Copies: Submit four copies of product schedule or list, unless otherwise indicated. Architect will return two copies.

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

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

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

I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design.

   1. Number of Copies: Submit one copies of subcontractor list, unless otherwise indicated. Architect will keep submittal.

2.2 INFORMATIONAL SUBMITTALS

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

   1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.

   2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

   3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section "Quality Requirements."
B. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Management and Coordination."

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

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

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

F. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

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

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

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

J. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

K. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

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

M. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

N. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
O. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section "Operation and Maintenance Data."

Q. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

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

S. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

2. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.

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

U. Construction Photographs: Comply with requirements specified in Division 1 Section "Photographic Documentation."

V. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.

1. Architect will not review submittals that include MSDSs and will return them for resubmittal.

2.3 DELEGATED DESIGN

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

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

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

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

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

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

C. 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.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

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

END OF SECTION 01330
SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

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

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

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

C. See Divisions 2 through 16 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

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

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

C. Laboratory Mockups: Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.

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

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

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

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

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

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

1.3 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

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

1.4 SUBMITTALS

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

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

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

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

1.5 QUALITY ASSURANCE

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

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

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

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

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

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

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

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.6 QUALITY CONTROL

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

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

2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

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

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

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

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

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

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

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

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

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

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 Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.

2. Comply with the Contract Document requirements for Division 1 Section "Cutting and Patching."

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

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

END OF SECTION 01400
SECTION 01420 - REFERENCES

PART 1 - GENERAL

1.1 Definitions

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

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

C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.

D. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.

E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": The term "install" describes operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.

I. "Installer": An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

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

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
K. "Project site" is the space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

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

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

C. Conflicting Requirements: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

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

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

   1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source and make them available on request.

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01420
SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY
   A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
   B. See Division 1 Section "Summary of Multiple Contracts" for division of responsibilities for temporary facilities and controls.
   C. See Division 1 Section "Execution Requirements" for progress cleaning requirements.
   D. See Divisions 2 through 16 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.
   E. See Division 2 Section "Dewatering" for disposal of ground water at Project site.

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

1.3 USE CHARGES
   A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.

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

1.5 QUALITY ASSURANCE
   A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
   B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
1.6  PROJECT CONDITIONS

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

PART 2 - PRODUCTS

2.1  MATERIALS

A. Pavement: Comply with notes on drawings. Repair damage caused by construction.

B. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.76-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with [1-5/8-inch- (42-mm-)].

C. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry"

D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2  TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.3  EQUIPMENT

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

B. HVAC Equipment: Provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.

2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction.
PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

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

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services. Contractor to provide temporary power for the building construction.

B. Water Service: Owner will allow the contractor to connect to the existing water system. The contractor will be required to provide and install a freeze proof yard hydrant. The location of the yard hydrant will be within 100’ of the job site. Contractor to provide the connection and valve to complete water connection. Obtain owner’s approval of location and installation methods before proceeding with the installation.

C. Sanitary Facilities: Provide temporary toilets, wash facilities during phase 1, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

D. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Use of the existing propane tank will be allowed. The contractor shall pay for all propane used during construction until substantial completion.

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

F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

1. Coordinate temporary electrical service with the Midwest Energy the electric utility.

2. Once the transformer has been relocated the contractor will be allowed to connect to the utility. The contractor will be required to provide the temporary distribution panel and
pay for all power consumed during construction until substantial completion. Obtain owner’s approval of location and installation methods before proceeding with the installation.

3. Install electric temporary power service overhead, unless otherwise indicated.

G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
   1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
   2. Telephone Service: Provide superintendent with cellular telephone for use on the job site.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
   1. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines. Comply with NFPA 241.
   2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
   2. Remove snow and ice as required to minimize accumulations.

C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.

D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
   1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

E. Temporary Use of Permanent Stairs: Cover finished, permanent stairs with protective covering of plywood or similar material so finishes will be undamaged at time of acceptance.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that
minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

C. Storm water Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and sub-grade construction to prevent flooding by runoff of storm water from heavy rains.

D. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

E. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.

F. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

I. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 OPERATION, TERMINATION, AND REMOVAL

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

B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

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

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.

2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section "Closeout Procedures."

END OF SECTION 01500
SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for 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. See Division 1 Section "Closeout Procedures" for submitting warranties for Contract closeout.

C. See Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.2 DEFINITIONS

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

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.

2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.

3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

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

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

1.3 SUBMITTALS

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

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
   a. Form of Acceptance: Change Order.
   b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

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

1. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable
product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Form of Approval: As specified in Division 1 Section "Submittal Procedures."
b. Use product specified if Architect cannot make a decision on use of a comparable product request within time allocated.

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

1.4 QUALITY ASSURANCE

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

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

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

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

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 weather-tight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.
1.6 PRODUCT WARRANTIES

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

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

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

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.
3. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

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

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

B. Product Selection Procedures:
1. Product: Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.

2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.

3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.

4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.

6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturers listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product.

7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 "Product Substitutions" Article for consideration of an unnamed product or system.

8. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.


   a. If no product available within specified category matches and complies with other specified requirements, comply with provisions in Part 2 "Product Substitutions" Article for proposal of product.

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

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

   b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.
2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 30 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

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

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.

2.3 COMPARABLE PRODUCTS

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

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01600
SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning 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.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

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

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


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. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

C. 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.

D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.
3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

   1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.

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.

3.6 PROGRESS CLEANING

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

2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. 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.

3.7 STARTING AND ADJUSTING

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

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

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safety. 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."

3.8 PROTECTION OF INSTALLED CONSTRUCTION

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

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

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

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

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

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

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

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

END OF SECTION 01700
SECTION 01731 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

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

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

C. See Division 7 Section "Through-Penetration Firestop Systems" for patching fire-rated construction.

1.2 SUBMITTALS

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

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.

2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.

3. Products: List products to be used and firms or entities that will perform the Work.

4. Dates: Indicate when cutting and patching will be performed.

5. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

6. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.3 QUALITY ASSURANCE

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

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.4 WARRANTY

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.

2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

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

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimum interruption to occupied areas.

3.3 PERFORMANCE

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

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

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

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

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

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

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

END OF SECTION 01731
PART 1 - GENERAL

1.1 Demolition Scope:
A. The work includes the demolition of the existing cabin directly east of the building site as described on the site plan.
B. The work also incudes cleaning up the site of the cabin which was destroyed by fire directly to the north and west of the convention center.
C. The floor slabs and foundations for both cabins will be retained as described in the demolition notes on the site plan.

1.2 SUMMARY
A. This Section includes the following:
   1. Demolition and removal of selected portions of building or structure.
   2. Demolition and removal of selected site elements.
B. See Division 1 Section "Construction Waste Management" for disposal of demolished materials.
C. See Division 2 Section "Site Clearing" for site clearing and removal of above- and below-grade improvements.

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 Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
1.4 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.

B. Predemolition Photograph: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Comply with Division 1 Section "Photographic Documentation." Submit before Work begins.

C. Landfill Records: Indicate receipt and acceptance of construction wastes by a landfill facility licensed to accept construction wastes.
   1. Comply with submittal requirements in Division 1 Section "Construction Waste Management."

1.5 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

D. Pre-demolition Conference: Conduct conference at project site.

1.6 PROJECT CONDITIONS

A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
   1. Before selective demolition, Owner will remove the following items:
      a. All interior furniture.

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

D. Hazardous Materials: It is unknown whether hazardous materials will be encountered in the Work.
1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Owner will remove hazardous materials under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Protect the fiber optic box which is mounted to the east side of the cabin and protect the underground cable.
   2. Locate the water service and disconnect and prepare to extend into the new building.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Verify that utilities have been disconnected and capped.
   B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS
   A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
   B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
      1. Arrange to shut off indicated utilities with utility companies.
      2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3.3 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 Division 1 Section "Temporary Facilities and Controls."
B. Temporary Facilities: Provide temporary barricades 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.

3.4 SELECTIVE DEMOLITION

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. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
   2. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   3. Dispose of demolished items and materials promptly.

B. 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 reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
   1. Comply with requirements specified in Division 1 Section "Construction Waste Management."

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

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

END OF SECTION 01732
SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

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

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

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

C. See Division 1 Section "Photographic Documentation" for submitting Final Completion construction photographs and negatives.

D. See Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.

E. See Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.

F. See Division 1 Section "Demonstration and Training" for requirements for instructing Owner's personnel.

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

1.2 SUBSTANTIAL COMPLETION

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

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.


10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.

11. Advise Owner of changeover in heat and other utilities.

12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

13. Complete final cleaning requirements, including touchup painting.

14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

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

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."

2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit 3 copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

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

1.5 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

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

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

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

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

   a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
   b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
   c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
   d. Remove tools, construction equipment, machinery, and surplus material from Project site.
   e. Remove snow and ice to provide safe access to building.
   f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
   g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
   h. Sweep concrete floors broom clean in unoccupied spaces.
   i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
   j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
   k. Remove labels that are not permanent.
   l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

      1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

   m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
   n. Replace parts subject to unusual operating conditions.
   o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
   p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
   q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
   r. Leave Project clean and ready for occupancy.
C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770
HSECTION 01781 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

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

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

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

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

1.2 SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set(s) of marked-up Record Prints.
2. Number of Copies: Submit copies of Record Drawings as follows:
   a. Final Submittal: Submit one set(s) of marked-up Record Prints, and the following:
      1) Record Transparencies: one set.
      2) Copies printed from Record Drawings; 1 copy of each Drawing, whether or not changes and additional information were recorded.

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

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

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

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

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

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. 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, whichever is most capable of showing actual physical conditions, 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. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

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

1. Record Prints: Organize Record Prints and newly prepared Record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
3. Identification: As follows:
   a. Project name.
   b. Date.
   c. Designation "PROJECT RECORD DRAWINGS."
   d. Name of Architect.
   e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

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

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. Note related Change Orders and Record Drawings where applicable.
2.3 RECORD PRODUCT DATA

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

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

2.4 MISCELLANEOUS RECORD SUBMITTALS

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

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

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

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

END OF SECTION 01781
PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation manuals for systems, subsystems, and equipment.
   2. Maintenance manuals for the care and maintenance of products, materials, and finishes systems and equipment.

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

1.2 SUBMITTALS

A. Manual: Submit two copies of each manual in final form upon substantial completion of the project.

PART 2 - PRODUCTS

2.1 MANUALS, GENERAL

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

B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
   1. Subject matter included in manual.
   2. Name and address of Project.
   3. Name and address of Owner.
   4. Date of submittal.
   5. Name, address, and telephone number of Contractor.
   6. Name and address of Architect.
   7. Cross-reference to related systems in other operation and maintenance manuals.

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

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
   a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.

4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.

B. Descriptions: Include the following:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Equipment identification with serial number of each component.
   4. Equipment function.
   5. Operating characteristics.
   6. Limiting conditions.
   7. Performance curves.
   8. Engineering data and tests.
   9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.3 PRODUCT MAINTENANCE MANUAL

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

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Product Information: Include the following, as applicable:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.4 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment:
D. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions, and demonstration and training videotape if available, that detail essential maintenance procedures:

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

B. 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.

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.

E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.

1. Do not use original Project Record Documents as part of operation and maintenance manuals.

F. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01782
SECTION 02221 - BUILDING DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demolition and removal of buildings.
   2. Disconnecting, capping site utilities as noted.

1.2 SUBMITTALS

A. Proposed Protection Measures: Submit informational report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection. Indicate proposed locations and construction of barriers.

B. Schedule of building demolition with starting and ending dates for each activity.

C. Demolition disposal records where debris was disposed of.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

C. Predemolition Conference: Conduct conference at Project site.

1.4 PROJECT CONDITIONS

A. One of the Buildings to be demolished was destroyed by fire. Its current conditions is an as is condition.

B. The other building is in an “as is condition” with the demolition work defined on the site plan.

C. Owner assumes no responsibility for buildings and structures to be demolished.

   1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. On-site storage or sale of removed items or materials is not permitted.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soils: Soil found on the site will be considered satisfactory as long as it is free of debris and vegetation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting demolition operations.

3.2 PREPARATION

A. Existing Utilities: Locate, identify, disconnect, and cap off indicated utilities serving buildings and structures to be demolished as noted.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
2. Do not start demolition work until utility disconnecting and sealing have been completed.

3.3 PROTECTION

A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.

B. Existing Utilities: Maintain utility services to remain and protect from damage during demolition operations. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.

C. Temporary Protection: Erect temporary protection, such as fences.

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
D. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.4 DEMOLITION

A. General: Demolish indicated buildings completely down to the floor slab. Use methods required to complete the Work within limitations of governing regulations.

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

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Explosives: Use of explosives is not permitted.

D. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.

E. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

F. Promptly repair damage to adjacent buildings caused by demolition operations.

3.5 CLEANING

A. Remove demolition waste materials from Project site and legally dispose of them in an approved landfill acceptable to authorities having jurisdiction.

B. Do not burn demolished materials.

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

END OF SECTION 02221
SECTION 02230 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Protecting existing site improvements to remain.
2. Removing existing trees, shrubs, grass and site improvements indicated.
3. Clearing and grubbing.
4. Stripping and remove topsoil from the site.
5. Removing above- and below-grade site improvements.
6. Disconnecting and capping or sealing site utilities as indicated.
7. Temporary erosion and sedimentation control measures as required by the city and state.

1.2 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.3 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

C. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - PRODUCTS[ (Not Applicable)]

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 2 Section "Earthwork."
1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE PROTECTION

A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete. During Plaza Paving Phase.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

3.4 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.

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

3.5 CLEARING AND GRUBBING

A. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3.7 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

3.8 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION 02230
SECTION 02260 - EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 SUMMARY
   A. This Section includes temporary excavation support and protection systems.

1.2 PERFORMANCE REQUIREMENTS
   A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.

1.3 SUBMITTALS (Not Applicable)

PART 2 - PRODUCTS

2.1 MATERIALS
   A. General: Provide materials that are either new or in serviceable condition.
   B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.
   C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
   D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of 3 inches (75 mm).

PART 3 - EXECUTION

3.1 PREPARATION
   A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
   B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
   C. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.
D. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches (1200 mm) below overlying construction and abandon remainder.

2. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.

B. Leave excavation support and protection systems permanently in place.

END OF SECTION 02260
PART 1 - GENERAL

1.1 SUMMARY
A. This Section includes the following:
   1. Preparing subgrades for slabs-on-grade, walks, lawns and grasses.
   2. Excavating and backfilling for buildings and structures.
   3. Drainage course for slabs-on-grade.
   4. Subbase course for concrete walks, pavements.
   5. Excavating and backfilling for utility trenches.

1.2 DEFINITIONS
A. Backfill: Soil material used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.
B. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
D. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
E. Excavation: Removal of material encountered above sub-grade elevations and to lines and dimensions indicated.
   1. Authorized Additional Excavation: Excavation below sub-grade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions changes in the Work.
   2. Unauthorized Excavation: Excavation below sub-grade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
F. Fill: Soil materials used to raise existing grades.
G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
H. Subbase Course: Course placed between the subgrade placed between the subgrade and a cement concrete pavement or a cement concrete walk.
I. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.3 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM AASHTO M 145 Soil Classification Groups A-1, A-2-4, A-2-5, and A-3, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Existing on site sandy soil material

E. Base Course: Naturally graded mixture of fill sand

F. Engineered Fill: Soil materials taken from the site shall be sampled by the testing lab to determine their ability to be used as adequate fill material. The lab shall determine the optimum moisture and compaction requirements.

G. Bedding Course: Naturally graded mixture of fill sand.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility.
PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 2 Section "Site Clearing."

C. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing," during earthwork operations.

3.2 EXCAVATION

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.3 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.
1. Clearance: **12 inches (300 mm)** each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. Excavate trenches **6 inches (150 mm)** deeper than elevation required in rock or other unyielding bearing material, **4 inches (100 mm)** deeper elsewhere, to allow for bedding course.

### 3.6 SUBGRADE INSPECTION

A. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

### 3.7 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of **2500 psi (17.2 MPa)**, may be used when approved by Architect.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

### 3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

2. Waste all excess material on site as directed by the owner and architect.

### 3.9 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
C. Backfill trenches excavated under footings and within 18 inches (450 mm) of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 3 Section

D. Provide 4-inch- (100-mm-) thick, concrete-base slab support for piping or conduit less than 30 inches (750 mm) below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches (100 mm) of concrete before backfilling or placing roadway subbase.

E. Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the utility pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of utility piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

F. Place and compact final backfill of satisfactory soil to final subgrade elevation.

G. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.10 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698 or as determined by the testing lab:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 92 percent.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.13 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch (25 mm).
2. Walks: Plus or minus 1 inch (25 mm).
3. Pavements: Plus or minus 1/2 inch (13 mm).

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.14 SUBBASE AND BASE COURSES

A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase and base course under pavements and walks as follows:

1. Shape subbase and base course to required crown elevations and cross-slope grades.
2. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Contractor shall engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing. Refer to the allowance section for the allowance allowed for special inspections which shall apply to all soils testing required of the project.
B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.16 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove waste material, including trash, and debris, and legally dispose of it off Owner's property.

B. Disposal: Remove surplus soil material, on the owner’s property as directed by the Owner and Architect.

END OF SECTION 02300
SECTION 02530 - SANITARY SEWERAGE

PART 1 - GENERAL

1.1 This section contains the requirements for the design and installation of the septic systems for this project.

1.2 SUMMARY

A. Section Includes:
   1. Pipe and fittings.
   2. Nonpressure and pressure couplings.
   3. Expansion joints.
   5. Septic Tanks.

1.3 SUBMITTALS

A. Design calculations used for sizing of the septic tanks and infiltrator chamber field.

B. Design layout, drawn to scale on a copy of the site plan of the septic tank and infiltrator chamber field.

C. Field quality-control reports from Barton County Environmental Department.

PART 2 - PRODUCTS

2.1 Pre-cast concrete septic tank: Provide a pre-cast concrete septic tank with pre-cast concrete cover and manhole access to exceed the requirements of the design calculations.

2.2 Manufactured Infiltrator chambers design to snap together, provide with multiport end cap.

A. Pipe and Fittings: ASTM A 888 or CISPI 301.

2.3 PVC PIPE AND FITTINGS

A. PVC Type PSM Sewer Piping:
   1. Pipe: ASTM D 3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
   2. Fittings: ASTM D 3034, PVC with bell ends.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

3.2 PIPING INSTALLATION

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground septic tank and sanitary sewer piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

C. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

D. Install gravity-flow, nonpressure, drainage piping according to the following:
   1. Install piping pitched down in direction of flow, at minimum slope of 2 percent unless otherwise indicated.
   2. Install PVC corrugated sewer piping according to ASTM D 2321 and ASTM F 1668.

E. Clear interior of piping of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

3.3 PIPE JOINT CONSTRUCTION

A. Join gravity-flow, nonpressure, drainage piping according to the following:
   1. Join PVC Type PSM sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasket joints.

3.4 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Install piping so cleanouts open in direction of flow in sewer pipe.
   1. Use Medium-Duty, top-loading classification cleanouts in paved foot-traffic areas.
   2. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.
B. Set cleanout frames and covers in earth in cast-in-place-concrete block, **18 by 18 by 6 inches** deep. Set with tops **1 inch** above surrounding grade.

C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

3.5 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains specified in Division 15 Section "Sanitary Waste and Vent Piping."

3.6 IDENTIFICATION

A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installation of green warning tapes directly over piping and at outside edges of underground manholes.

1. Use detectable warning tape over nonferrous piping and over edges of underground manholes.

3.7 FIELD QUALITY CONTROL

A. Barton County Environmental shall inspect the installation according to their inspection requirements.

1. Submit separate report for each inspection.
   a. Submit initial inspection of the site and approval of design.
   b. Submit final acceptance report of installed system.

2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.

3. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.

2. Test completed piping systems according to requirements of authorities having jurisdiction.

3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.

4. Submit separate report for each test.

5. Hydrostatic Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction and the following:

   a. Fill sewer piping with water. Test with pressure of at least **10-foot (3-m)** head of water, and maintain such pressure without leakage for at least 15 minutes.

   b. Close openings in system and fill with water.

   c. Purge air and refill with water.
d. Disconnect water supply.
e. Test and inspect joints for leaks.

C. Leaks and loss in test pressure constitute defects that must be repaired.

D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION 02530
SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.

B. See Division 2 Section "Earthwork" for drainage fill under slabs-on-grade.

1.2 SUBMITTALS

A. Product Data: For each manufactured material and product indicated.

B. Design Mixes: For each concrete mix indicated.

C. Shop Drawings: Include details of steel reinforcement placement including material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports.

D. Material test reports.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

B. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.

1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.

2. Formwork and form accessories.

3. Steel reinforcement and supports.

4. Concrete mixtures.

5. Handling, placing, and constructing concrete.

C. Pre-installation Conference: Conduct conference at Project site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Formwork: Furnish formwork and form accessories according to ACI 301.
B. Steel Reinforcement:
   1. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
   2. Plain-Steel Wire: ASTM A 82, as drawn.

C. Concrete Materials:
   1. Portland Cement: ASTM C 150, Type I, II, or III.
   2. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1-1/2-inch (38-mm) nominal size and not less than 3/4 inch nominal size.

D. Admixtures:
   2. Water-Reducing Admixture: ASTM C 494, Type A.
   3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
   4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
   5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
   6. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 (4.75-mm) sieve and 10 to 30 percent passing a No. 100 (0.15-mm) sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

E. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber

F. Curing Materials:
   2. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf.
   5. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.2 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:
   1. Compressive Strength (28 Days): from 3,000 psi to 4000 psi for foundations and flat work, minimum 5 sack cement, 35% No.67 rock, Commercial Sand, AE, WR
2. Slump: 4 inches (100 mm).

C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 5 to 8 percent.

1. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.

2.3 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with ASTM C 94.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

B. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Formwork: Design, construct, erect, shore, brace, and maintain formwork according to ACI 301.

B. Steel Reinforcement: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

C. Joints: Construct joints true to line with faces perpendicular to surface plane of concrete.

1. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Architect.

2. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

   a. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.

3. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

   a. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch (3 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
b. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Tolerances: Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

3.2 CONCRETE PLACEMENT

A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

B. Do not add water to concrete during delivery, at Project site, or during placement.

C. Consolidate concrete with mechanical vibrating equipment.

3.3 FINISHING UNFORMED SURFACES

A. General: Comply with ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.4 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions occur before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

D. Cure formed and unformed concrete for at least seven days as follows:
1. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
3.5 FIELD QUALITY CONTROL

A. Testing Agency: Contractor shall engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Testing and handling shall be performed according to ACI 301.
   1. Testing Frequency: At least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mix placed each day.
   2. Each test shall include a slump test, air test, and the lab technician shall cast five cylinders. Two shall be broken at 7 days, 2 at 28 days and 1 as a spare.

3.6 PARKING LOT STRIPING

A. Parking lot striping shall be installed as shown on the parking lot plan.
   1. The paint material shall be equivalent to Sherwin Williams Setfast Acrylic Waterborne Traffic Marking Paint (TM226/TM225).
   2. Install paint according to manufacturer’s specifications, including but not limited to surface preparation, job conditions, and paint application.
   3. Strips shall be 4” wide.

SECTION 03300
SECTION 3360 – Polished Concrete

PART 1 – GENERAL

1.1 SUMMARY

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

C. Related Sections:
   1. Division 3 Section “Cast-In-Place Concrete” for general applications of concrete and coordination of sample submittal [and color selection].
   2. Division 7 Section “Joint Sealants” for colored sealant for joints.

1.2 REFERENCES

A. American Concrete Institute (ACI):
   1. ACI 301 “Specification for Structural Concrete for Buildings.”
   2. ACI 302 IR “Recommended Practice for Concrete Floor and Slab Construction.”
   3. ACI 303.1 “Standard Specification for Cast-In-Place Architectural Concrete.”
   4. ACI 304 “Recommended Practice for Measuring, Mixing, Transporting and Placing of Concrete.”
   5. ACI 305R “Recommended Practice for Hot Weather Concreting.”
   6. ACI 306R “Recommended Practice for Cold Weather Concreting.”

B. American Society for Testing and Materials (ASTM):
   1. ASTM C309 “Liquid Membrane-Forming Compounds for Curing Concrete.”
   2. ASTM C494 “Standard Specification for Chemical Admixtures for Concrete.”

1.3 SUBMITTALS

A. Product Data: Submit manufacturer’s complete technical data sheets for the following:
   2. Curing compound.
   3. Joint sealers

B. Product data for each grinding machine, including all types of grinding heads, dust extraction system, joint filler, concrete densifying impregnator, penetrating sealer, and any other chemicals used in the process.

C. Applicators qualification data.

1.4 QUALITY ASSURANCE

A. Comply with the requirements of ACI 301.
B. Pre-installation Conference: Conduct conference at project site to comply with requirements in Division 1 “Project Management and Coordination.”

PART 2 – PRODUCTS

2.2 MATERIALS

A. Curing and Sealing Compound: Cureseal-W™ Gloss and Cureseal-S™ Gloss; equivalent to L.M. SCOFIELD COMPANY. Curing and sealing compound shall comply with ASTM C309 and be of same manufacturer as colored admixture, for use with integrally colored concrete.

B. SUBSTITUTIONS: The use of products other than those specified will be considered providing that the Contractor requests its use in writing within 14-days prior to bid date. This request shall be accompanied by the following:

1. A certificate of compliance from material manufacturer stating that proposed products meet or exceed requirements of this Section, including standards ACI 303.1, ASTM C979, ASTM C494 and AASHTO M194.

2. Documented proof that proposed materials have a 10-year proven record of performance, confirmed by at least 5 local projects that [Architect] [Landscape Architect] [Engineer] can examine.

3.1.1 POLISHED CONCRETE APPLICATION

A. Applicator shall examine the areas and conditions under which work of this section will be provided and the General Contractor shall correct conditions detrimental to the timely and proper completion of the work and the Applicator shall not proceed until unsatisfactory conditions are resolved.

B. Fill construction joints and cracks with filler products as specified in accordance with manufacturer’s instructions colored to match (or contrast) with concrete color as specified by architect.

C. Grind the concrete floor to within 1 inch of walls with 16, 25, 40, 60, 80 and/or 150 grit removing construction debris, floor slab imperfections and until there is a uniform scratch pattern and desired concrete aggregate exposure.

D. Apply material approved by architect for color effects in accordance with the architectural drawings and the manufacturer’s recommended guidelines.

E. Apply densifying impregnator undiluted at approximately 200 square feet per gallon using a stiff, long bristled broom. Cover the entire area liberally. Using a broom, work the densifier into the substrate for 30 minutes. During this 30-minute period, continually keep the substrate wet with densifier. Squeegee excess material off the floor. Allow 12 to 24 hours for full cure.

F. Grind the floor to within 1 inch of walls with metal bonded diamond grits of 150 and 300—grinding 90 degrees from each previous grind and removing all the scratches from the previous grit. Vacuum the floor thoroughly after each grind using a squeegee vacuum attachment.
G. (If specified) Grind the edges with 40, 60, 120 and 220 grit grinding pads removing all of the scratches from the previous grit. Vacuum the floor thoroughly after each grind using a squeegee vacuum attachment.

H. Polish the floor, to desired sheen level, with phenolic resin bonded diamond grits of 100, 400, 800, 1500 and 3000—first polishing the edges (if specified) with pads of the same grit and then the field of the floor removing all scratches from the previous grit. After each polish, clean the floor thoroughly using clean water and an auto scrubber or a mop and a wet vacuum.

I. After the floor has dried, apply densifier at a rate of 300 square feet per gallon. Using a broom, work the material into the floor for a minimum of 10 minutes. Tight squeegee the remaining material from the floor without leaving squeegee marks or puddles. Allow to cure for 12 – 24 hours.

J. Using a high speed (2000 – 3000 rpm) burnishing machine and hogs hair burnishing pad, buff the surface to a high shine.

K. Upon completion, the work shall be ready for final inspection and acceptance by the customer.

3.2 CURING

A. Apply curing and sealing compound for concrete according to manufacturer's instructions using manufacturer’s recommended application techniques. Apply curing and sealing compound at consistent time for each pour to maintain close color consistency.

B. Curing compound shall be same color as the colored concrete and supplied by same manufacturer of the colored admixture.

C. Precautions shall be taken in hot weather to prevent plastic cracking resulting from excessively rapid drying at surface as described in CIP 5 Plastic Shrinkage Cracking published by the National Ready Mixed Concrete Association.

D. Do not cover concrete with plastic sheeting.

3.3 TOLERANCES

A. Minor variations in appearance of integrally colored concrete, which are similar to natural variations in color and appearance of uncolored concrete, are acceptable.

3.7 CLEANING

A. The work area shall be kept clean and free of debris at all times.

B. Remove slurry and dust from adjoining surfaces as necessary.

C. Dispose of material containers in accordance with local regulations.

D. Protect finished work until fully cured per manufacturer’s recommendations.
1.1 FLOOR PROTECTION

A. The General Contractor is responsible for using Temporary Floor Protection throughout the project to safeguard the surface quality of concrete slabs before and after application of decorative finishes or installations of other materials.

B. All concrete floors that will be not be covered by other materials will be protected throughout the project. The concrete slab must be treated as a finished floor at all times during construction.

C. Temporary Floor Protection will be removed only while finish work to the concrete is being performed and will be replaced after the final finish has cured sufficiently.

END OF SECTION 03300
SECTION 04810 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes unit masonry assemblies consisting of the following:
   1. Concrete masonry units (CMUs).

B. See Division 5 Section "Metal Fabrications" for furnishing steel lintels and shelf angles for unit masonry.

C. See Division 7 Section "Sheet Metal Flashing and Trim" for furnishing manufactured reglets installed in masonry joints for metal flashing.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 PROJECT CONDITIONS

A. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

B. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 COLORS, TEXTURES, AND PATTERNS

A. Exposed Masonry Units: As selected from manufacturer's full range.

2.2 CONCRETE MASONRY UNITS (CMUs)

A. Shapes: Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.

B. Concrete Masonry Units: ASTM C 90.
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of **1900 psi (13.1 MPa)**.

2. Weight Classification: **Lightweight**.

3. Pattern and Texture for Decorative Units:
   a. Standard pattern, ground finish.
   b. Provide radius bull nose at outside corners.
   c. Provide double radius bull nose at doorway jamb blocks

### 2.3 MORTAR AND GROUT MATERIALS (Gray Natural Color)

**A.** Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.

**B.** Hydrated Lime: **ASTM C 207**, Type S.

**C.** Masonry Cement: **ASTM C 91**.

**D.** Aggregate for Mortar: ASTM C 144.

**E.** Aggregate for Grout: ASTM C 404.

**F.** Water: Potable.

### 2.4 REINFORCEMENT

**A.** Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, **Grade 60** (Grade 420).

**B.** Masonry Joint Reinforcement: **ASTM A 951**; mill galvanized, carbon-steel wire for interior walls and hot-dip galvanized, carbon-steel wire for exterior walls.

1. Wire Size for Side Rods: **W1.7 or 0.148-inch (3.8-mm)** diameter.
2. Wire Size for Cross Rods: **W1.7 or 0.148-inch (3.8-mm)** diameter.
   a. Ladder type with 1 side rod at each face shell of hollow masonry units more than 4 inches (100 mm) in width, plus 1 side rod at each wythe of masonry 4 inches (100 mm) or less in width.

### 2.5 TIES AND ANCHORS

**A.** Materials:

2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, hot-dip galvanized after fabrication to comply with ASTM A 153/A 153M.
3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch (16-mm) cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches (50 mm) parallel to face of veneer.

C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches (100 mm) wide.

1. Wire: Fabricate from 3/16-inch- (4.8-mm-) diameter, hot-dip galvanized steel wire.

D. Adjustable Masonry-Veneer Anchors

1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:

   a. Structural Performance Characteristics: Capable of withstanding a 100-lbf (445-N) load in both tension and compression without deforming or developing play in excess of 0.05 inch (1.3 mm).

2. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.

   a. Anchor Section: Rib-stiffened, sheet metal plate with screw holes top and bottom, and slotted holes for inserting wire tie.

   b. Fabricate sheet metal anchor sections from [0.067-inch- (1.7-mm-)] [0.097-inch- (2.5-mm-)] thick, steel sheet, galvanized after fabrication.

   c. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from [0.188-inch- (4.8-mm-)] [0.25-inch- (6.4-mm-)] diameter, hot-dip galvanized steel wire.

2.6 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with Division 7 Section "Sheet Metal Flashing and Trim."

2.7 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains from new masonry without damaging masonry. Use product approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.8 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, unless otherwise indicated.

   1. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: Comply with ASTM C 270 Proportion Specification.
1. For masonry below grade or in contact with earth, use Type S.
2. For reinforced masonry, use Type S or N.
3. For interior non-load-bearing partitions, Type O may be used instead of Type N.

C. Grout for Unit Masonry: Comply with ASTM C 476.
   1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
   2. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL
   A. Use full-size units without cutting if possible. If cutting is required, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
   B. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
   C. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and with the following:
      1. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.
      2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2 inch (12 mm) maximum.

3.2 LAYING MASONRY WALLS
   A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
   B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
   C. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
   D. Fill space between foundation and masonry, below weep cord, solidly with mortar, unless otherwise indicated.
E. 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.

3.3 MORTAR BEDDING AND JOINTING

A. Lay concrete masonry units as follows:
   1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
   2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
   3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.
   4. With entire units, including areas under cells, fully bedded in mortar at starting course on footings where cells are not grouted.

3.4 COMPOSITE MASONRY

A. Corners: Provide interlocking masonry unit bond in each wythe and course at corners, unless otherwise indicated.

B. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, bond walls together as follows:
   1. Provide rigid metal anchors not more than 24 inches (610 mm) o.c. If used with hollow masonry units, embed ends in mortar-filled cores.

3.5 CLEANING

A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
   1. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes.
   2. Protect adjacent surfaces from contact with cleaner.
   3. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
   4. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
   5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

3.6 MASONRY WASTE DISPOSAL

1. Waste Disposal as Fill Material: Dispose of clean masonry waste, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 04810
SECTION 06105 - MISCELLANEOUS CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Framing with dimension lumber.
   2. Wood blocking, cants, and nailers.
   3. Wood furring and grounds.
   4. Wood sleepers.
   5. Plywood backing panels.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 DIMENSION LUMBER FRAMING

A. Maximum Moisture Content: 19 percent.

B. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade of any species.

C. Other Framing: Construction or No. 2 grade and any of the following species:
   1. Hem-fir (north); NLGA.
   2. Douglas fir-larch; WCLIB or WWPA.
   3. Douglas fir-south; WWPA.
   4. Hem-fir; WCLIB or WWPA.
   5. Douglas fir-larch (north); NLGA.
   6. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.3 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking.
2. Nailers.
3. Cants.
4. Furring.
5. Grounds.

2.4 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, in thickness indicated or, if not indicated, not less than 1/2-inch (13-mm) nominal thickness.

2.5 FASTENERS

A. General: Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners.


C. 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.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

END OF SECTION 06105
SECTION 06108 - EXTERIOR ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:


1.2 SUBMITTALS

A. Evaluation Reports: For the following, from:

   1. Composite Lumber

PART 2 - PRODUCTS

2.1 PLASTIC LUMBER

A. Plastic Lumber, General: Products acceptable to authorities having jurisdiction and for which current model code evaluation reports exist that show compliance with building code in effect for Project for indicated occupancy and type of construction.

   1. Allowable loads and spans, as documented in evaluation reports or in information referenced in evaluation reports, shall not be less than design loads and spans indicated.

B. Composite Plastic Lumber: Solid shapes made from a mixture of cellulose fiber and polyethylene or polypropylene.

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

      a. Advanced Environmental Recycling Technologies, Inc.
      b. Brite Manufacturing Inc.
      c. Carney Timber Company, Inc.
      d. Certainteed Corporation.
      e. Correct Building Products, LLC.
      f. Elk Composite Building Products, Inc.
      g. Epoch Composite Products, Inc.
      h. Fiber Composites, LLC.
      i. Green Tree Composites, LLC.
      j. Kadant Composites, Inc.
      k. Louisiana-Pacific Corporation.
      l. Master Mark Plastics.
      m. Midwest Manufacturing Extrusion.
      n. TimberTech.
o. Trex Company, Inc.
p. Universal Forest Products, Inc.

2. Surface Texture: Woodgrain.

2.2 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches (38 mm) into wood substrate.

1. For plastic decking, use stainless-steel fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Set exterior rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit exterior rough carpentry to other constructions; scribe and cope as needed for accurate fit.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction" unless otherwise indicated.

C. Install plastic lumber to comply with manufacturer's written instructions.

D. Secure trim material with exposed decking fasteners, counter sink head, 2 fasteners per board to support location.

END OF SECTION 06108
SECTION 06160 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Wall sheathing.
2. Building paper.
5. Flexible flashing at openings in sheathing.

1.2 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

B. Research/Evaluation Reports: For the following:
   1. Building wrap.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

A. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.

B. Oriented Strand Board: DOC PS 2.

2.2 FASTENERS

A. General: Provide screw type fasteners of size and type indicated by manufacturer for wall sheathing installation.

   1. For wall and roof sheathing panels, provide fasteners with corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
2.3 WEATHER-RESISTANT SHEATHING PAPER

A. Building Paper: ASTM D 226, Type I (No. 15 asphalt-saturated organic felt), unperforated.

B. Building Wrap: ASTM E 1677, Type I air retarder; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
2. Products: Subject to compliance with requirements, provide one of the following:
   a. Dow Chemical Company (The); Styrofoam Weathermate Plus Brand Housewrap.
   b. DuPont (E. I. du Pont de Nemours and Company); Tyvek CommercialWrap
   c. Ludlow Coated Products; Barricade Building Wrap.
   d. Pactiv, Inc.; GreenGuard Ultra Wrap.
   e. Raven Industries Inc.; Rufco-Wrap.

3. Water-Vapor Permeance: Not less than 125g through 1 sq. m of surface in 24 hours per ASTM E 96, Desiccant Method (Procedure A).

C. Building-Wrap Tape: Tape recommended by building-wrap manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Securely attach to substrate by fastening as indicated, complying with the following:
   1. NES NER-272 for power-driven fasteners.
   2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."

B. Coordinate sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that exclude exterior moisture.

C. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 WEATHER-RESISTANT SHEATHING-PAPER INSTALLATION

A. General: Cover sheathing with weather-resistant sheathing paper as follows:
   1. Cut back barrier 1/2 inch (13 mm) on each side of the break in supporting members at expansion- or control-joint locations.
   2. Apply barrier to cover vertical flashing with a minimum 4-inch (100-mm) overlap, unless otherwise indicated.
B. Building Paper: Apply horizontally with a 2-inch (50-mm) overlap and a 6-inch (150-mm) end lap; fasten to sheathing with galvanized staples or roofing nails.

C. Building Wrap: Comply with manufacturer's written instructions.
   1. Seal seams, edges, fasteners, and penetrations with tape.
   2. Extend into jambs of openings and seal corners with tape.

3.3 SHEATHING JOINT-AND-PENETRATION TREATMENT

A. Seal sheathing joints according to sheathing manufacturer's written instructions.
   1. Apply elastomeric sealant to joints and fasteners and trowel flat. Seal other penetrations and openings.
   2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints, and apply and trowel silicone emulsion sealant to embed tape in sealant. Apply sealant to exposed fasteners. Seal other penetrations and openings.

3.4 PROTECTION

A. Paper-Surfaced Gypsum Sheathing: Protect sheathing by covering exposed exterior surface of sheathing with weather-resistant sheathing paper securely fastened to framing. Apply covering immediately after sheathing is installed.

END OF SECTION 06160
SELECTION 07210 - BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Masonry Wall Insulation.
2. Concealed building insulation.
3. Exposed building insulation.
4. Vapor retarders.
5. Sound attenuation insulation.

1.2 PERFORMANCE REQUIREMENTS

A. Provide glass-fiber insulation where indicated lenu ms whose test performance is rated as follows for use in plenums as determined by testing identical products per "Erosion Test" and "Mold Growth and Humidity Test" described in UL 181, or on comparable tests from another standard acceptable to authorities having jurisdiction.

1. Erosion Test Results: Insulation shows no visible evidence of cracking, flaking, peeling, or delamination of interior surface of duct assembly, after testing for 4 hours at 2500-fpm (13-m/s) air velocity.
2. Mold Growth and Humidity Test Results: Insulation shows no evidence of mold growth, delamination, or other deterioration due to the effects of high humidity, after inoculation with Chaetomium globosium on all surfaces and storing for 60 days at 100 percent relative humidity in the dark.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.
B. Samples for Verification: Full-size units for each type of exposed insulation indicated.

1.4 QUALITY ASSURANCE

A. Retain ASTM test method below based on product and kind of fire-resistance characteristic specified for each product in Part 2. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84 for surface-burning characteristics and other methods indicated with product, by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
   1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV, 1.60 lb/cu. ft. (26 kg/cu. m), with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively: 3/4” thick at masonry walls
   1. Manufacturers:
      a. DiversiFoam Products.
      b. Dow Chemical Company.
      c. Owens Corning.
      d. Pactiv Building Products Division.

2.3 GLASS-FIBER BLANKET INSULATION

A. Manufacturers:
   1. CertainTeed Corporation.
   2. Guardian Fiberglass, Inc.
   4. Knauf Fiber Glass.
   5. Owens Corning.

B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

C. Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (blankets with reflective membrane facing), Class A (membrane-faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with kraft faced vapor-retarder membrane on 1 face.

D. Where glass-fiber blanket insulation is indicated by the following thicknesses, provide blankets in batt or roll form with thermal resistances indicated:
   1. 5-1/2 inches (140 mm) thick with a thermal resistance of 21 deg F x h x sq. ft./Btu at 75 deg F (3.7 K x sq. m/W at 24 deg C).
2.4 INSULATION FASTENERS

A. Adhesively Attached, Spindle-Type Anchors: Plate formed from perforated galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square, welded to projecting copper-coated steel spindle 0.105 inch (2.67 mm) in diameter and of length capable of holding insulation of thickness indicated securely in position with 1-1/2-inch-(38-mm-) square or diameter self-locking washers complying with the following requirements:

B. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

2.5 VAPOR BARRIER:

A. Install clear 20 mil vis-queen as a vapor barrier on the interior side of all exterior walls.

PART 3 - Adhesively Attached, Spindle-Type Anchors: Plate formed from perforated galvanized carbon-EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.

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.

3.2 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. Seal joints between foam-plastic insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.

C. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated.

1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.

D. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:
1. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.

2. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.

END OF SECTION 07210
SECTION 07460 - SIDING

PART 1 - GENERAL

1.1 SUMMARY
A. Section includes fiber-cement siding.

1.2 SUBMITTALS
A. Product Data: For each type of product indicated.
B. Maintenance data.
C. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE
A. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.
B. Preinstallation Conference: Conduct conference at Project site.

1.4 WARRANTY
A. Special Warranty: Standard form in which manufacturer agrees to repair or replace siding that fail(s) in materials or workmanship within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FIBER-CEMENT SIDING
A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
2. Basis-of-Design Product: The design is based on James Hardie shingle shingle, staggered edge panel, 7" exposure, subject to compliance with requirements, provide or comparable product by one of the following:
a. Cemplank.
b. CertainTeed Corp.
c. GAF Materials Corporation.
d. James Hardie.
e. MaxiTite, Inc; a California corporation.
f. Nichiha Fiber Cement.

3. Shingle Pattern: Thickness ¼”; Length 48”, Height 15.9”, Exposure 7”, Pcs./Pallet 100, sq./Pallet 2, Pcs./Sq. 50.0
   a. Texture: **Wood grain**.
   b. Factory finished, color selected from standard colors.
   c. Provide trim accessories with factory applied nail strips to minimize exposed fasteners

2.2 ACCESSORIES

A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.
   1. Provide accessories adjacent siding unless otherwise indicated.

B. Fasteners:
   1. For fastening fiber cement, use hot-dip galvanized where un-exposed, use stainless-steel fasteners where exposed.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of siding and related accessories.

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

3.2 INSTALLATION

A. General: Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
   1. Do not install damaged components.

B. Install fiber-cement siding and related accessories.
   1. Install fasteners no less than 24 inches (600 mm) o.c.
C. Install joint sealants as specified in Division 7 Section "Joint Sealants" and to produce weathertight installation.

3.3 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 07460
SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Formed high-slope roof flashing and trim.
   2. Formed wall flashing and trim.

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Show layouts, profiles, shapes, seams, dimensions, and details for fastening, joining, supporting, and anchoring sheet metal flashing and trim.

C. Samples: For each type of sheet metal flashing and trim.

1.3 QUALITY ASSURANCE

A. 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.

B. Preinstallation Conference: Conduct conference at project site.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. Prepainted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

   1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
   2. Exposed Finishes: Apply the following coil coating:

      a. Factory Prime Coating: Factory-applied, Hylar 5000tm / Kynar 500 fluropon finish full strength (70%).
2.2 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

B. Felt Underlayment: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
   1. Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

C. Fasteners: Wood screws, annular threaded nails, self-locking screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.
   1. Nails for Copper Sheet: Copper, hardware bronze, or Series 300 stainless steel, 0.109 inch (2.8 mm) minimum and not less than 7/8 inch (22 mm) long, barbed with large head.
   2. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
   3. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.

D. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

E. Elastomeric Sealant: ASTM C 920, elastomeric [polyurethane] [polysulfide] [silicone] polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.


H. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat.

2.3 REGLETS

A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions.
   1. Manufacturers:
      a. Cheney Flashing Company, Inc.
      b. Fry Reglet Corporation.
      c. Heckmann Building Products Inc.
      d. Hickman, W. P. Company.
2. Material: Galvanized steel, **0.0217 inch (0.55 mm)** thick.

### 2.4 FABRICATION, GENERAL

**A. General:** Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.

**B. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.**

1. **Seams for Aluminum:** Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

2. **Seams for Other Than Aluminum:** Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

**C. Sealed Joints:** Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

**D. Expansion Provisions:** Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.

**E. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.**

**F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal, and in thickness not less than that of metal being secured.**

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

**A. General:** Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. **Torch cutting of sheet metal flashing and trim is not permitted.**

**B. Metal Protection:** Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.

E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

1. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.

G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
2. Aluminum: Use aluminum or stainless-steel fasteners.
3. Copper: Use copper, hardware bronze, or stainless-steel fasteners.

H. Seal joints with elastomeric sealant as required for watertight construction.

3.2 ROOF FLASHING INSTALLATION

A. General: Install sheet metal roof flashing and trim to comply with performance requirements and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49.

1. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at 24-inch (600-mm) centers.

C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Secure in a waterproof manner. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with elastomeric sealant.

D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Install flashing as follows:
1. Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing.
2. Seal with elastomeric sealant and clamp flashing to pipes penetrating roof except for lead flashing on vent piping.

3.3 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to SMACNA recommendations and as indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Reglets: Installation of reglets is specified in Division 4 Section "Unit Masonry Assemblies."

C. Openings Flashing in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches (100 mm) beyond wall openings.

END OF SECTION 07620
SECTION 07920 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY
   A. Section Includes:
      1. Urethane joint sealants.

1.2 SUBMITTALS
   A. Product Data: For each joint-sealant product indicated.
   B. Samples: For each kind and color of joint sealant required.
   C. Joint-Sealant Schedule: Include the following information:
      1. Joint-sealant application, joint location, and designation.
      2. Joint-sealant manufacturer and product name.

1.3 WARRANTY
   A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
      1. Warranty Period: One years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL
   A. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
      1. Architectural Sealants: 250 g/L.
      2. Sealant Primers for Nonporous Substrates: 250 g/L.
      3. Sealant Primers for Porous Substrates: 775 g/L.

   B. Liquid-Applied Joint Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

2.2 URETHANE JOINT SEALANTS

A. Urethane Joint Sealant: ASTM C 920.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
   a. BASF Building Systems.
   b. Bostik, Inc.
   d. May National Associates, Inc.
   e. Pacific Polymers International, Inc.
   f. Pecora Corporation.
   g. Polymeric Systems, Inc.
   h. Schnee-Morehead, Inc.
   i. Sika Corporation; Construction Products Division.
   j. Tremco Incorporated.

2. Type: Single component or multicomponent (M).
3. Grade: Pourable (P) or nonsag (NS).
4. Class: 100/50.
5. Uses Related to Exposure: Traffic (T) or Nontraffic (NT).

2.3 JOINT SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

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 preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

1. Remove laitance and form-release agents from concrete.
2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2 INSTALLATION

A. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

B. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

D. Install sealants using proven techniques that 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 in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs 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 sealant from surfaces adjacent to joints.
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 profile per Figure 8A in ASTM C1193, unless otherwise indicated.

F. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.3 FIELD QUALITY CONTROL

A. Sealants not evidencing adhesive failure or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates.

3.4 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:
   a. Control and expansion joints in brick pavers.
   b. Isolation and contraction joints in cast-in-place concrete slabs.
   c. Joints between plant-precast architectural concrete paving units.
   d. Tile control and expansion joints.
   e. Joints between different materials listed above.
   f. Other joints as indicated.


3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces

1. Joint Locations:
   b. Joints between plant-precast architectural concrete units.
   c. Control and expansion joints in unit masonry.
   d. Joints between different materials listed above.
   e. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
   f. Control and expansion joints in ceilings and other overhead surfaces.
   g. Other joints as indicated.

C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. **Joint Locations:**
   b. Control and expansion joints in tile flooring.
   c. Other joints as indicated.

2. **Joint Sealant:** Urethane.

3. **Joint-Sealant Color:** As selected by Architect from manufacturer's full range of colors.

### D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. **Joint Locations:**
   a. Control and expansion joints on exposed interior surfaces of exterior walls.
   b. Perimeter joints of exterior openings where indicated.
   c. Tile control and expansion joints.
   d. Vertical joints on exposed surfaces of interior unit masonry, concrete, walls, and partitions.
   e. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
   f. Other joints as indicated.

### E. Joint-Sealant Application: 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. Tile control and expansion joints where indicated.
   c. Other joints as indicated.

2. **Joint Sealant:** Urethane.

3. **Joint-Sealant Color:** As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200
SECTION 08110 - STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY
A. This Section includes steel doors and frames.

1.2 SUBMITTALS
A. Product Data: For each product indicated. Include door designation, type, level and model, material description, label compliance, fire-resistance ratings, and finishes.
B. Door Schedule. Use same reference designations indicated on Drawings.

1.3 QUALITY ASSURANCE
A. Steel Door and Frame Standard: Comply with ANSI A 250.8, unless more stringent requirements are indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Amweld Building Products, Inc.
2. Benchmark Commercial Doors; a division of General Products Co., Inc.
3. Ceco Door Products; a United Dominion Company.
4. Copco Door Co.
5. Curries Company.
6. Deansteel Manufacturing, Inc.
7. Kewanee Corporation (The).
8. Mesker Door, Inc.
10. Republic Builders Products.
11. Steelcraft; a division of Ingersoll-Rand.

2.2 MATERIALS
A. Hot-Rolled Steel Sheets: ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
B. Cold-Rolled Steel Sheets: ASTM A 366/A 366M, Commercial Steel (CS), or ASTM A 620/A 620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.

C. Electrolytic Zinc-Coated Steel Sheet: ASTM A 591/A 591M, Commercial Steel (CS), Class B coating; mill phosphatized; suitable for unexposed applications; stretcher-leveled standard of flatness where used for face sheets.

2.3 DOORS

A. Interior Doors: Complying with ANSI 250.8 for level and model and ANSI A250.4 for physical-endurance level indicated.
   1. Level 2 and Physical Performance Level B, Model 1 (Full Flush).

B. Exterior Doors: Complying with ANSI A250.8 for level and model and ANSI A250.4 for physical-endurance level indicated.
   1. Level 3 and Physical Performance Level A, Model 1 (Full Flush).

2.4 FRAMES

A. General: ANSI A250.8; conceal fastenings, unless otherwise indicated.

B. Frame Steel Sheet Thickness:
   1. 0.053-inch- (1.3-mm-)

C. Door Silencers: Three silencers on single-door frames and two silencers on double-door frames.

D. Plaster Guards: 0.016-inch- (0.4-mm-) thick, steel sheet plaster guards or mortar boxes to close off interior of openings.

E. Supports and Anchors: Not less than 0.042-inch- (1.0-mm-) thick zinc-coated steel sheet.

   1. Masonry Wall Anchors: 0.177-inch- (4.5-mm-) diameter, steel wire complying with ASTM A 510 (ASTM A 510M) may be used in place of steel sheet.

F. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Zinc-coat items that are to be built into exterior walls according to ASTM A 153/A 153M, Class C or D as applicable.

2.5 FABRICATION

A. General: Fabricate steel door and frame units to comply with ANSI A250.8 free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant.

B. Exterior Doors: Fabricate doors, panels, and frames from metallic-coated steel sheet. Close top and bottom edges of doors flush as an integral part of door construction or by addition of 0.053-inch- (1.3-mm-) thick, metallic-coated steel channels with channel webs placed even with top and bottom edges.
C. Interior Door Faces: Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from cold-rolled steel sheet.

D. Core Construction: Manufacturer's standard core construction that produces a door complying with SDI standards.

E. Clearances for Non-Fire-Rated Doors: Not more than \( \frac{1}{8} \) inch (3.2 mm) at jambs and heads, except not more than \( \frac{1}{4} \) inch (6.4 mm) between pairs of doors. Not more than \( \frac{3}{4} \) inch (19 mm) at bottom.

F. Clearances for Fire-Rated Doors: As required by NFPA 80.

G. Door-Edge Profile: **Square edge, unless beveled edge is indicated.**

H. Tolerances: Comply with SDI 117.

I. Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware.

J. Frame Construction:
   1. Fabricate frames with mitered or coped and continuously welded corners and seamless face joints. Provide temporary spreader bars.
   2. Provide 4” heads at masonry wall construction

K. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.

L. Locate hardware as indicated or, if not indicated, according to ANSI A250.8.

M. Glazing Stops: Manufacturer's standard, formed from 0.032-inch- (0.8-mm-) thick steel sheet.
   1. Provide screw-applied, removable, glazing stops on inside of glass, louvers, and other panels in doors.

2.6 FINISHES

A. Prime Finish: Manufacturer's standard, factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Placing Frames: Comply with provisions in SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set.
After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

1. Wall Anchors: Provide at least three anchors per jamb. For openings 90 inches (2286 mm) or more in height, install an additional anchor at hinge and strike jambs.
2. Gypsum Board Partitions: For in-place partitions, install knock-down, drywall slip-on frames.
3. Fire-Rated Frames: Install according to NFPA 80.

B. Door Installation: Comply with ANSI A250.8. Shim as necessary to comply with SDI 122 and ANSI/DHI A115.1G.

1. Fire-Rated Doors: Install within clearances specified in NFPA 80.
2. Smoke Control Doors: Install to comply with NFPA 105.

C. After installation, remove protective wrappings from doors and frames and touch up prime coat with compatible air-drying primer.

END OF SECTION 08110
SECTION 08410 - ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Exterior storefront window systems

1.2 PERFORMANCE REQUIREMENTS

A. Provide systems, including anchorage, capable of withstanding loads and thermal and structural movements indicated without failure when supporting full dead loads and without framing members transferring stresses to glazing.

B. Structural Loads:
   1. Wind Load: 80 mph exposure C

C. Structural Performance: Provide systems, including anchorage, capable of withstanding loads indicated.
   1. Deflection Normal to Glazing Plane: Limited to 1/175 of clear span or 3/4 inch (19 mm), whichever is smaller.
   2. Deflection Parallel to Glazing Plane: When carrying full dead load, not to exceed amount that reduces glazing bite below 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch (3.2 mm).

D. Structural Testing: ASTM E 330 at 150 percent of inward and outward wind-load design pressures for duration required by design wind velocity without system evidencing material failures, structural distress, deflection failures, or permanent deformation of main framing members exceeding 0.2 percent of clear span.

E. Air Infiltration: Limited to 0.06 cfm/sq. ft. (0.3 L/s per sq. m) of system surface area when tested according to ASTM E 283 at a static-air-pressure difference of 1.57 lbf/sq. ft. (75.2 Pa)

F. Water Penetration: No water leakage when tested according to ASTM E 331 at minimum differential pressure of 20 percent of inward acting wind-load design pressure but not less than 6.24 lbf/sq. ft. (299 Pa).

G. Temperature Change (Range): Accommodate 120 deg F (67 deg C) ambient and 180 deg F (100 deg C) material surfaces.

H. Condensation Resistance Factor (CRF): Not less than 45 per AAMA 1503.1.

I. Average Thermal Conductance (U-Value): Not more than 0.63 Btu/sq. ft. x h x deg F (3.57 W/sq. m x K) per AAMA 1503.1.
1.3 SUBMITTALS

A. Product Data: For each system indicated.

B. Shop Drawings: Include plans, elevations, sections, details of installation and attachments to other Work.
   1. Prepare data based on testing and engineering analysis of manufacturer's standard units in systems similar to those indicated for this Project.
   2. For entrance systems, include hardware schedule and locations.

C. Samples: For each exposed finish and for each color required.

1.4 QUALITY ASSURANCE

A. Preconstruction Sealant Testing: Perform structural silicone 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. Determine corrective measures, if any, required to prepare each substrate material to ensure compatibility with and adhesion of sealants, including, but not limited to, specially formulated primers.


1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace systems that fail in materials and workmanship within two years from date of Substantial Completion. Failure includes, but is not limited to the following:
   1. Adhesive or cohesive sealant failures.
   2. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
   3. Failure of operating components to function normally.
   4. Water leakage through fixed glazing and frame areas.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product: The design for systems is based on Manko Series 2450 Thermal Store Front Framing System with sub-frames. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
   1. EFCO Corporation.
   2. Kawneer Company, Inc.
3. Manko Products
4. Vista Wall Architectural Products

2.2 MATERIALS


B. Glazing: Specified in Division 8 Section "Glazing."

C. Glazing Gaskets: Pressure-glazing system of black, resilient glazing gaskets with sealed corners, setting blocks, and shims or spacers.

D. Gaskets, Sealants, and Joint Fillers:
   1. For joints within framing system, as recommended in writing by manufacturer for joint type indicated.
   2. For joints at perimeter of systems as specified in Division 7 Section "Joint Sealants."

2.3 COMPONENTS

A. Fasteners, Flashings, and Accessories: Compatible with adjacent materials, corrosion-resistant, nonstaining, and nonbleeding. Use concealed fasteners except for application of door hardware.

B. Store Front Window system, 1” x 2-1/4” Aluminum Framed Window as Detailed.

2.4 FABRICATION

A. Fabricate framing in profiles indicated for flush glazing (without projecting stops). Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system.

B. Fabricate components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.

C. Components only as necessary for shipment and installation.

2.5 ALUMINUM FINISHES

A. Bronzer Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker

PART 3 - EXECUTION

3.1 INSTALLATION
A. Isolate metal surfaces in contact with incompatible metal or corrosive substrates, including wood, by painting contact surfaces with bituminous paint or primer or by applying sealant or tape recommended by manufacturer.

B. Install components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.

C. Install glazing to comply with requirements of Division 8 Section "Glazing."

D. Install sealants at system perimeter to comply with requirements of Division 7 Section "Joint Sealants."

E. Install framing components true in alignment with established lines and grades to the following tolerances:

1. Variation from Plane: Limit to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
2. Alignment: For surfaces abutting in line, limit offset to 1/16 inch (1.5 mm). For surfaces meeting at corners, limit offset to 1/32 inch (0.8 mm).
3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm)

3.2 FIELD QUALITY CONTROL

A. Waster Spray Test: After completing installation of each area, test system for water penetration according to AAMA 501.2.

1. Repair or remove and replace Work that fails or is damaged by testing; repair or replace to comply with requirements.

END OF SECTION 08410
SECTION 08711 - DOOR HARDWARE

PART 1 - GENERAL   Refer to division 1 for allowance that affects the work of this section.

1.1 SUMMARY
   A. This Section includes the following:
      1. Commercial door hardware.
      2. Cylinders for doors shall be Best Lock to match the existing keying system.

1.2 SUBMITTALS
   A. Product Data: For each product indicated.
   B. Shop Drawings: Include details of electrified door hardware and wiring diagrams.
   C. Samples: For each exposed finish.
   D. Door Hardware Schedule: Organized into door hardware sets indicating type, style, function, size, label, hand, manufacturer, fasteners, location, and finish of each door hardware item. Include description of each electrified door hardware function, including sequence of operation.
   E. Keying Schedule: Detail Owner's final keying instructions for locks.
   F. Product certificates.

1.3 QUALITY ASSURANCE
   A. Supplier Qualifications: Person who is or employs a qualified DHI Architectural Hardware Consultant.
   B. Source Limitations: Obtain electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that are listed to perform electrical modifications, by a testing and inspecting agency acceptable to authorities having jurisdiction, are acceptable.
   C. Keys: Deliver keys to Owner.
   D. Templates: Obtain and distribute templates for doors, frames, and other work specified to be factory prepared for installing door hardware.
   E. Certified Products: Provide door hardware that is listed in BHMA directory of certified products.

1.4 WARRANTY
A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within warranty period.
   1. Warranty Period for Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Product: Subject to compliance with requirements, provide the product named for each door hardware item indicated in Door Hardware Sets.

B. Basis-of-Design Product: Product named for each door hardware item indicated in Door Hardware Sets establishes the basis of design. Provide either the named product or a comparable product by one of the manufacturers specified for each type of hardware item.

2.2 DOOR HARDWARE

A. Scheduled Door Hardware: Provide door hardware according to the allowance listed in division 1. All labor to install hardware shall be included in the base bid. Arrange for a time to meet with the architect to determine the hardware requirements for the project.

2.3 FABRICATION

A. Base Metals: Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials if different from specified standard.

B. Fasteners: Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated. Provide steel machine or wood screws or steel through bolts for fire-rated applications.

C. Spacers or Sex Bolts: For through bolting of hollow metal doors.

D. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."

E. Finishes: Comply with BHMA A156.18.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine doors and frames for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
B. Steel Door and Frame Preparation: Comply with DHI A115 series. Drill and tap doors and frames for surface-applied hardware according to SDI 107.

C. Wood Door Preparation: Comply with DHI A115-W series.

D. Mounting Heights: Comply with the following requirements, unless otherwise indicated:

2. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."

E. Adjust and reinforce attachment substrates as necessary for proper installation and operation. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

1. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

F. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with accessibility requirements.

1. Door Closers: Adjust sweep period so that from an open position of 70 degrees, the door will take at least three seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

END OF SECTION 08711
SECTION 08800 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes glazing for the following products and applications:
   
   1. Doors.
   2. Storefront framing.

1.2 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Thermal Movements: Provide glazing that allows for thermal movements resulting from a maximum change (range) of $120 \text{ deg} \, F$ ($67 \text{ deg} \, C$), $180 \text{ deg} \, F$ ($100 \text{ deg} \, C$) in ambient and surface temperatures, respectively, 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.

C. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:

   1. For insulating-glass units, properties are based on units with lites 6 mm thick and a nominal 1/2-inch (13-mm) wide interspace.
   2. Center-of-Glass U-Values: NFRC 100 methodology using LBL-35298 WINDOW 4.1 computer program, expressed as Btu/ sq. ft. x h x deg F (W/sq. m x K).

1.3 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Sealant compatibility and adhesion test reports.

1.4 QUALITY ASSURANCE

A. Sealant Compatibility and Adhesion Testing: Use sealant manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
B. Insulating-Glass Certification Program: Permanently marked with certification label of Insulating Glass Certification Council.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form, made out to Owner and signed by manufacturer, in which manufacturer agrees to furnish replacements for units that deteriorate from normal use by developing defects attributable to the manufacturing process, f.o.b. the nearest shipping point to Project site, within warranty period.

1. Insulating Glass:
   a. Deterioration: Failure of hermetic seal resulting in obstruction of vision by dust, moisture, or film on interior surfaces of glass.
   b. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other articles including schedules where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.

2.2 GLASS MATERIALS

A. Annealed Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); class as indicated in schedules at the end of Part 3.

B. Wire Glass shall be provide for doors as scheduled. Glass shall be ¼” thick and meet the requirements for wire glass as defined in the International Building Code.

C. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.

1. Provide Kind HS (heat-strengthened) float glass in place of annealed glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in "Performance Requirements" Article. Provide Kind FT (fully tempered) where safety glass is indicated.

2. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated in the Insulating-Glass Schedule at the end of Part 3 are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.


4. Spacer: Manufacturer's standard
5. Corner Construction: **Manufacturer's standard.**
6. Overall Unit Thickness and Thickness of Each Lite: 1”.
7. Interspace Content: **Argon**
8. Glass Tint: Clear

D. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411

2.3 GLAZING SEALANTS

A. General: Provide products of type indicated, 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. Colors of Exposed Sealants: **As selected.**

B. Elastomeric Glazing Sealants: ASTM C 920, Type S (single component), Grade NS (nonsag), Class 25, Use NT (nontraffic), M, G, A, and, as applicable to glazing substrates indicated, O.

C. Cylindrical Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.4 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.
2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

2.5 GLAZING GASKETS

A. Compression Gaskets: Molded or extruded gaskets of type and material indicated below and of profile and hardness required to maintain watertight seal:


2.6 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. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.7 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.

PART 3 - EXECUTION

3.1 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.

1. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
2. Protect glass edges from damage during handling and installation. Remove glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance from Project site and legally dispose of off Project site.
3. Apply primers to joint surfaces where required for adhesion of sealants, as determined by sealant compatibility and adhesion testing.
4. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
5. Provide spacers for glass lites where the length plus width is larger than 50 inches (1270 mm) unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances.

B. Protection:

1. 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.
2. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter.

C. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged, including natural causes, accidents, and vandalism, during construction period.

END OF SECTION 08800
SECTION 08830 - MIRRORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes the following types of silvered flat glass mirrors:
   1. Annealed monolithic glass mirrors.

1.2 QUALITY ASSURANCE

A. Glazing Publications: Comply with GANA's "Glazing Manual" and "Mirrors, Handle with Extreme Care: Tips for the Professional on the Care and Handling of Mirrors."

B. Safety Glazing Products: For film-backed or laminated mirrors, provide products complying with testing requirements in 16 CFR 1201 for Category II materials.

C. Preconstruction Mirror Mastic Compatibility Test: Submit mirror mastic products to mirror manufacturer for testing to determine compatibility of mastic with mirror backing and substrates on which mirrors are installed.

1.3 WARRANTY

A. Special Warranty: Manufacturer's standard form in which mirror manufacturer agrees to replace mirrors that deteriorate within specified warranty period. Deterioration of mirrors is defined as defects developed from normal use that are not attributed to mirror breakage or to maintaining and cleaning mirrors contrary to manufacturer's written instructions. Defects include discoloration, black spots, and clouding of the silver film.
   1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

A. Clear Glass: Mirror Glazing Quality; ultraclear (low-iron) float glass with a minimum 91 percent visible light transmission.
   1. Nominal Thickness: 3.0 mm or 4.0 mm.

2.2 MISCELLANEOUS MATERIALS

A. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

B. Edge Sealer: Approved by mirror manufacturer.
C. Mirror Mastic: An adhesive setting compound, asbestos-free, produced specifically for setting mirrors.

D. Film Backing for Safety Mirrors: Film backing and pressure-sensitive adhesive; both compatible with mirror backing paint as certified by mirror manufacturer.

2.3 FABRICATION

A. Mirror Edge Treatment: **Flat polished**. Seal edges of mirrors with edge sealer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine substrates, over which mirrors are to be mounted, with Installer present, for compliance with installation tolerances, substrate preparation, and other conditions affecting performance of the Work.

1. Verify compatibility with and suitability of substrates, including compatibility of mirror mastic with existing finishes or primers.
2. Proceed with installation only after unsatisfactory conditions have been corrected and surfaces are dry.

B. Comply with mastic manufacturer's written installation instructions for preparation of substrates, including coating substrates with mastic manufacturer's special bond coating where applicable.

C. General: Install mirrors to comply with mirror manufacturer's written instructions and with referenced GANA publications. Mount mirrors accurately in place in a manner that avoids distorting reflected images.

D. Wall-Mounted Mirrors: Install mirrors with mastic. Protect mirrors from breakage and contaminating substances resulting from construction operations.

E. Do not permit edges of mirrors to be exposed to standing water.

F. Maintain environmental conditions that will prevent mirrors from being exposed to moisture from condensation or other sources for continuous periods of time.

G. Wash exposed surface of mirrors not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash mirrors as recommended in writing by mirror manufacturer.

END OF SECTION 08830
SECTION 09111 - NON-LOAD-BEARING STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes non-load-bearing steel framing members for the following applications:
   1. Interior framing systems (e.g., supports for partition walls, framed soffits, furring, etc.).
   2. Exterior wall framing (e.g., supports for exterior walls, etc.).

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

1.3 QUALITY ASSURANCE

A. Sound Transmission Characteristics: For STC-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

PART 2 - PRODUCTS

2.1 NON-LOAD-BEARING STEEL FRAMING, GENERAL

A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
   1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
   2. Protective Coating: manufacturer's standard corrosion-resistant zinc coating, unless otherwise indicated.

2.2 STEEL FRAMING FOR FRAMED ASSEMBLIES

A. Steel Studs and Runners: ASTM C 645.
   1. Minimum Base-Metal Thickness: As indicated on Drawings.

B. Slip-Type Head Joints: Where indicated, provide one of the following:
   1. Single Long-Leg Runner System: ASTM C 645 top runner with 2-inch- (50.8-mm-) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into
top runner and with continuous bridging located within 12 inches (305 mm) of the top of studs to provide lateral bracing.

2. Double-Runner System: ASTM C 645 top runners, inside runner with 2-inch- (50.8-mm-) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.

3. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

   a. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

C. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

   1. Minimum Base-Metal Thickness: 0.0312 inch (0.79 mm) or as noted on the drawings.

D. Cold-Rolled Channel Bridging: 0.0538-inch (1.37-mm) bare-steel thickness, with minimum 1/2-inch- (12.7-mm-) wide flanges.

   1. Depth: 1-1/2 inches (38.1 mm).
   2. Clip Angle: Not less than 1-1/2 by 1-1/2 inches (38.1 by 38.1 mm), 0.068-inch- (1.73-mm-) thick, galvanized steel.

E. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

   1. Minimum Base Metal Thickness: As indicated on Drawings.
   2. Depth: As indicated on Drawings.

2.3 AUXILIARY MATERIALS

A. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Isolation Strip at Exterior Walls: Provide one of the following:

   1. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
   2. Foam Gasket: Adhesive-backed, closed-cell vinyl foam strips that allow fastener penetration without foam displacement, 1/8 inch (3.2 mm) thick, in width to suit steel stud size.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.
1. Gypsum Plaster Assemblies: Also comply with requirements in ASTM C 841 that apply to framing installation.
2. Portland Cement Plaster Assemblies: Also comply with requirements in ASTM C 1063 that apply to framing installation.
3. Gypsum Veneer Plaster Assemblies: Also comply with requirements in ASTM C 844 that apply to framing installation.
4. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

3.2 INSTALLING FRAMED ASSEMBLIES

A. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

B. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling.

1. Slip-Type Head Joints: Where framing extends to overhead structural supports, install to produce joints at tops of framing systems that prevent axial loading of finished assemblies.
2. Door Openings: Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
   a. Install two studs at each jamb, unless otherwise indicated.
   b. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (12.7-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
   c. Extend jamb studs through suspended ceilings and attach to underside of overhead structure.

3. Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.
5. Curved Partitions:
   a. Bend track to uniform curve and locate straight lengths so they are tangent to arcs.
   b. Begin and end each arc with a stud, and space intermediate studs equally along arcs. On straight lengths of not less than 2 studs at ends of arcs, place studs 6 inches (150 mm) o.c.

C. Direct Furring:

1. Screw to wood framing.
2. Attach to concrete or masonry with stub nails, screws designed for masonry attachment, or powder-driven fasteners spaced 24 inches (610 mm) o.c.
D. 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.

END OF SECTION 09111
SECTION 09911 - PAINTING (CONSUMER LINE PRODUCTS)

PART 1 - GENERAL

1.1 SUMMARY
   A. This Section includes surface preparation and field painting of exposed interior and exterior items and surfaces.

1.2 SUBMITTALS
   A. Product Data: For each product indicated.
   B. Samples: For each type of finish-coat material indicated.

1.3 PROJECT CONDITIONS
   A. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.
   B. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).
   C. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
      1. Porter Paint

2.2 PAINT MATERIALS, GENERAL
   A. 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.
   B. 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. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. Colors: As selected from manufacturer's full range.

2.3 PREPARATORY COATS

A. Interior Primer: Interior latex-based or alkyd primer of finish coat manufacturer and recommended in writing by manufacturer for use with finish coat and on substrate indicated.

1. Ferrous-Metal Substrates: Quick drying, rust-inhibitive metal primer.
2. Zinc-Coated Metal Substrates: Galvanized metal primer.
3. Where manufacturer does not recommend a separate primer formulation on substrate indicated, use paint specified for finish coat.

2.4 INTERIOR FINISH COATS

A. Interior Low-Luster Acrylic Enamel: (Door Frames which are painted)

B. Interior Water based Epoxy Finish: (Interior CMU Walls)

2.5 EXTERIOR FINISH COATS


PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with procedures specified in PDCA P4 for inspection and acceptance of surfaces to be painted.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

C. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
D. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Cementitious Materials: Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
   a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
   b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
   c. If transparent finish is required, backprime with spar varnish.
   d. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

E. Material Preparation:

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

F. Exposed Surfaces: Include areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

1. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
2. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
3. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
4. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
5. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.

G. Sand lightly between each succeeding enamel or varnish coat.

H. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Omit primer over metal surfaces that have been shop primed and touchup painted.
2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.

I. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

J. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.

K. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

L. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

M. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

N. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

O. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.

3.2 CLEANING AND PROTECTING

A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

B. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

C. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.3 EXTERIOR PAINT SCHEDULE

A. Ferrous Metal Surfaces: (Low-Luster Finish)

1. Acrylic Finish: Two finish over a primer.
a. Primer: Porter Paints/PPG; 215 PORTER GUARD DTM Acrylic Metal Primer/Finish (135 g/L VOC); 3.0 Dry Mils.
b. Intermediate: Porter Paints/PPG; 2809 PORTER GUARD DTM Acrylic Satin Enamel (85 g/L VOC); 2.0 to 3.0 Dry Mils.
c. Finish Coat: Porter Paints/PPG; 2809 PORTER GUARD DTM Acrylic Satin Enamel (85 g/L VOC); 2.0 to 3.0 Dry Mils.

3.4 INTERIOR PAINT SCHEDULE

A. Concrete Masonry Wall Units (Semi-Gloss Acrylic Finish)
   a. Primer: Porter Paints/PPG; 6223 Pro-Master 2000 Interior/Exterior Latex Block Filler (28 g/L VOC); 4.8 to 14 Dry Mils.
   b. Intermediate: Porter Paint/PPG; Aquapon WB Epoxy two-component, waterborne epoxy (66 g/L VOC); 1.6 Dry Mils.
   c. Finish Coat: Porter Paint/PPG; Aquapon WB Epoxy two-component, waterborne epoxy (66 g/L VOC); 1.6 Dry Mils.
SECTION 10155 - TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Solid-polymer toilet compartments configured as toilet enclosures; entrance screens and urinal screens.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.

C. Samples for each exposed product and for each color and texture specified.

D. Product certificates.

E. Maintenance data.

1.3 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

   1. Flame-Spread Index: 75 or less.
   2. Smoke-Developed Index: 450 or less.

B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) for toilet compartments designated as accessible."

PART 2 - PRODUCTS

2.1 SOLID-POLYMER UNITS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

   1. Accurate Partitions Corporation.
   2. Ampco, Inc.
5. General Partitions Mfg. Corp.
6. Global Steel Products Corp.
7. Hadrian Manufacturing Inc.
9. Metpar Corp.
12. Santana Products, Inc.
13. Sanymetal; a Crane Plumbing company.
14. Weis-Robart Partitions, Inc.

B. Toilet-Enclosure Style: Overhead braced.

C. Urinal-Screen Style: Wall hung.

D. Door, Panel, and Pilaster Construction: Solid, high-density polyethylene (HDPE) or polypropylene (PP) panel material, not less than 1 inch (25 mm) thick, seamless, with eased edges and with homogenous color and pattern throughout thickness of material.

E. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; polymer or stainless steel.
   1. Polymer Color and Pattern: Contrasting with pilaster, as selected by Architect from manufacturer's full range.

F. Urinal-Screen Post: Manufacturer's standard post design of material matching the thickness and construction of pilasters.

G. Brackets (Fittings):
   1. Stirrup Type: Ear or U-brackets, chrome-plated zamak or clear-anodized aluminum or stainless steel for toilet partitions
   2. Full-Height (Continuous) Type: Manufacturer's standard design; extruded aluminum or stainless steel for urinal screens.

2.2 ACCESSORIES

A. Hardware and Accessories: Manufacturer's standard design, heavy-duty operating hardware and accessories.
   1. Material: Clear-anodized aluminum or Stainless steel.
   2. Hinges: Manufacturer's standard paired, self-closing type that can be adjusted to hold doors open at any angle up to 90 degrees
   3. Latch and Keeper: Manufacturer's standard surface-mounted latch unit designed for emergency access and with combination rubber-faced door strike and keeper. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible.
   4. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories.
5. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
6. Door Pull: Manufacturer's standard unit at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible.

B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.

C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel or chrome-plated steel or brass, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel, hot-dip galvanized steel, or other rust-resistant, protective-coated steel.

2.3 FABRICATION

A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.

B. Door Size and Swings: Unless otherwise indicated, provide 24-inch- (610-mm-) wide, in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide, out-swinging doors with a minimum 32-inch- (813-mm-) wide, clear opening for compartments designated as accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.

B. Clearances: Maximum 1/2 inch (13 mm) between pilasters and panels; 1 inch (25 mm) between panels and walls.

C. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than three brackets attached at midpoint and near top and bottom of panel. Locate wall brackets so holes for wall anchors occur in masonry or tile joints. Align brackets at pilasters with brackets at walls.

3.2 ADJUSTING

A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors and doors in entrance screens to return doors to fully closed position.

END OF SECTION 102113
SECTION 10280 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify products using designations indicated.

C. Maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 2 - PRODUCTS

2.1 PUBLIC-USE WASHROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc. (ASI)
5. GAMCO Specialty Accessories; a division of Bobrick Washroom Equipment, Inc.
6. Tubular Specialties Manufacturing, Inc.
PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

TOILET AND BATH ACCESSORIES (provide listed fixture or equivalent)

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand dryers</td>
<td>World XA52-974 115v(20amps)</td>
<td>4 each</td>
</tr>
<tr>
<td>Toilet Tissue dispenser</td>
<td>Provided by owner installed by contractor</td>
<td>12 each</td>
</tr>
<tr>
<td>Grab Bars/Rails:</td>
<td>ASI 3800 Type 1</td>
<td>4 ea - 36” and 4 ea - 42”</td>
</tr>
<tr>
<td>Soap Disp:</td>
<td>Provided by owner installed by contractor</td>
<td>8 each</td>
</tr>
<tr>
<td>Mirrors</td>
<td>ASI 20650 or equivalent 24” x 36”</td>
<td>12 each</td>
</tr>
</tbody>
</table>

END OF SECTION 102800
SECTION 10520 - FIRE-PROTECTION SPECIALTIES

PART 1 - GENERAL

Refer to Code Footprint for location of fire extinguishers. The extinguishers located in the mechanical room shall be hung on brackets. All other fire extinguishers shall be located in cabinets.

1.1 SUMMARY

A. This Section includes the following:
   1. Portable fire extinguishers.
   2. Fire-protection cabinets.
   3. Mounting brackets for fire extinguishers.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.
   1. Fire Extinguishers: Include rating and classification.
   2. Fire-Protection Cabinets: Include door hardware, cabinet type, trim style, panel style, and details of installation.

B. Samples: For each exposed cabinet finish.

C. Maintenance data.

1.3 QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

C. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements of ASTM E 814 for fire-resistance rating of walls where they are installed.

1.4 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Apply decals vinyl lettering on field-painted fire-protection cabinets after painting is complete.
1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of portable fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Failure of hydrostatic test according to NFPA 10.
   b. Faulty operation of valves or release levers.

2. Warranty Period: One years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.

B. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:

2. Extruded Shapes: ASTM B 221 (ASTM B 221M).

C. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.3 PORTABLE FIRE EXTINGUISHERS

A. Manufacturers:

1. Amerex Corporation.
2. Ansul Incorporated.
5. Fire End & Croker Corporation.
7. JL Industries, Inc.
8. Kidde Fyrnetics.
10. Modern Metal Products; Div. of Technico.
12. Potter Roemer; Div. of Smith Industries, Inc.
13. Watrous; Div. of American Specialties, Inc.

B. General: Provide fire extinguishers of type, size, and capacity for each fire-protection cabinet and mounting bracket indicated.

1. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.

C. Multipurpose Dry-Chemical Type in Steel Container: UL-rated 4-A:60-B:C; 10-lb (4.5-kg) nominal capacity, with mono ammonium phosphate-based dry chemical in enameled-steel container.

2.4 FIRE-PROTECTION CABINET

A. Basis-of-Design Product Simi Recessed Metal Cabinet with half glass:

B. Manufacturers:

1. Fire End & Croker Corporation.
3. JL Industries, Inc.
5. Larsen's Manufacturing Company.
6. Modern Metal Products; Div. of Technico.
7. Moon American.
8. Potter Roemer; Div. of Smith Industries, Inc.
9. Watrous; Div. of American Specialties, Inc.

C. Cabinet Type: Suitable for fire extinguisher.

D. Cabinet Construction: Nonrated.

E. Cabinet Material Enameled-steel sheet.

F. Semirecessed Cabinet: Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).

1. Rolled-Edge Trim: 2-1/2-inch (64-mm) backbend depth.

G. Cabinet Trim Material: Steel sheet Same material and finish as door.

H. Door Material: Steel sheet.

I. Door Style: Center glass panel with frame.
J. Door Glazing: **Tempered float glass (clear)**
   1. Acrylic Sheet Color: Clear transparent acrylic sheet painted **white** on unexposed side.

K. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
   1. Provide **projecting door pull and friction latch**.
   2. Provide **continuous hinge, of same material and finish as trim**, permitting door to open 180 degrees.

L. Accessories:
   1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, with plated or baked-enamel finish.
   2. Lettered Door Handle: One-piece, cast-iron door handle with the word "FIRE" embossed into face.

M. Finishes:
   1. Manufacturer's standard baked-enamel paint for the following:
      a. Exterior of cabinet **door trim, door, and trim**, except for those surfaces indicated to receive another finish.
      b. Interior of cabinet **and door**.
   2. Steel: **Factory primed with manufacturer's standard, lead- and chromate-free, universal primer, for field painting Baked enamel, with minimum dry film thickness of 2 mils (0.05 mm)**.
      a. Color and Texture: **As selected by Architect from manufacturer's full range**.

2.5 MOUNTING BRACKETS

A. Manufacturers:
   1. Amerex Corporation.
   2. Ansul Incorporated.
   5. Fire End & Croker Corporation.
   7. JL Industries, Inc.
   9. Potter Roemer; Div. of Smith Industries, Inc.

B. Mounting Brackets: Manufacturer's standard **galvanized** steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
   1. Color: **Red**.
C. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
   1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.

2.6 FABRICATION
A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Weld joints and grind smooth.
   1. Construct fire-rated cabinets with double walls fabricated from 0.0428-inch- (1.1-mm-) thick, cold-rolled steel sheet lined with minimum 5/8-inch- (16-mm-) thick, fire-barrier material. Provide factory-drilled mounting holes.
B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
   1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
   2. Miter and weld perimeter door frames.
C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

PART 3 - EXECUTION

3.1 INSTALLATION
A. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.
B. Examine fire extinguishers for proper charging and tagging. Remove and replace damaged, defective, or undercharged units.
C. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.
D. Install fire-protection specialties in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.
E. Fire-Protection Cabinets: Fasten fire-protection cabinets to structure, square and plumb.
   1. Provide inside latch and lock for break-glass panels.
   2. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
F. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

G. Identification: Apply decals at locations indicated.

H. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

I. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair.

END OF SECTION 10520
SECTION 13125 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Structural-steel framing.
   2. Metal roof panels.
   3. Metal soffit panels.
   4. Thermal insulation.
   5. Accessories.

1.2 SUBMITTALS

A. Product Data: For each type of metal building system component.

B. Shop Drawings: For metal building system components. Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

D. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data and calculations signed and sealed by the qualified professional engineer responsible for their preparation.

E. Metal Building System Certificates: For each type of metal building system, from manufacturer.

   1. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:
      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 design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
      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. AISC 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.

F. Warranties: Sample of special warranties.

1.3 QUALITY ASSURANCE

A. 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. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

C. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.

D. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

E. Preinstallation Conference: Conduct conference at Project site.

1.4 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. A&S Building Systems, Inc.; Division of NCI Building Systems, L.P.
2. Alliance Steel, Inc.
3. American Buildings Company; Division of Magnatrax Corp.
4. American Steel Building Co., Inc.
6. Butler Manufacturing Company; a BlueScope Steel company.
7. Ceco Building Systems; Division of NCI Building Systems, L.P.
8. Chief Buildings; Division of Chief Industries, Inc.
9. Mesco Building Solutions; Division of NCI Building Systems, L.P.
10. Metallic Building Company; Division of NCI Building Systems, L.P.
11. Star Building Systems; an NCI company.
12. VP Buildings; a United Dominion company.
13. Vulcan Steel Structures, Inc.

2.2 METAL BUILDING SYSTEM PERFORMANCE

A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Metal building systems shall be designed according to procedures in MBMA's "Metal Building Systems Manual."

1. Design Loads: As indicated on Drawings.
2. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:
   b. Girts: Horizontal deflection of 1/240 of the span.
   c. Metal Roof Panels: Vertical deflection of 1/240 of the span.
   d. Metal Wall Panels: Horizontal deflection of 1/240 of the span.
   e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.

3. Drift Limits: Engineer building structure to withstand design loads with drift limits no greater than the following:
   a. Lateral Drift: Maximum of 1/400 of the building height.

4. Metal panel assemblies shall withstand the effects of gravity loads and loads and stresses within limits and under conditions indicated according to ASTM E 1592.

C. Thermal Movements: 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 calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 180 deg F (100 deg C), material surfaces.
D. Air Infiltration for Metal Roof Panels: Air leakage through assembly of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) of roof area when tested according to ASTM E 1680 at negative test-pressure difference of 1.57 lbf/sq. ft. (75 Pa).

E. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 at test-pressure difference of 2.86 lbf/sq. ft. (137 Pa).

F. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 2.86 lbf/sq. ft. (137 Pa).

G. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for Class 90.

2.3 STRUCTURAL-STEEL FRAMING

A. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafter, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly.
2. Frame Configuration: as shown on the drawings.
3. Exterior Column Type: Uniform depth.
4. Rafter Type: Uniform depth.
5. Portal Frame sidewall bracing required. No “X” bracing allowed in the side walls.
6. Roof bracing shall be provide using steel rods which shall be field painted to match the color of the ceiling liner panel.
7. Flange braces which are exposed inside the finished space shall be field painted to match the adjacent wall or ceiling color.

B. End-Wall Framing: Full frame end-wall fabricated for field-bolted assembly.

C. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating.

D. Bolts: Provide plain-finish bolts for structural-framing components that are primed or finish painted. Provide zinc-plated or hot-dip galvanized bolts for structural-framing components that are galvanized.

2.4 METAL ROOF PANELS

A. Vertical-Rib, Standing-Seam Metal Roof Panels: Formed with ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.
1. Material: Zinc-coated (galvanized) or Aluminum-zinc alloy-coated steel sheet, minimum
24 gage nominal thickness.
   b. Color: As selected by Architect from manufacturer's full range of colors.
2. Clips: Manufacturer's standard, floating type to accommodate thermal movement;
fabricated from zinc-coated (galvanized) steel.
3. Joint Type: Panels snapped together. OR
4. Joint Type: Mechanically seamed, double folded according to manufacturer's standard.
5. Panel Coverage: 12” to 36’.
6. Panel Height: 2” to 3”.

B. Tapered-Rib-Profile, Lap-Seam Metal Roof Panels <Insert drawing designation>: Formed

2.5 METAL SOFFIT PANELS
A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and
interconnecting side edges of adjacent panels and mechanically attaching through panel to
supports using exposed and/or concealed fasteners and factory-applied sealant in side laps.
Include accessories required for weathertight installation.

1. Material: Zinc-coated (galvanized) or Aluminum-zinc alloy-coated steel sheet, minimum
26 gage nominal thickness.
   b. Color: As selected by Architect from manufacturer's full range of colors.
2. Joint Type: Panels snapped together. OR
3. Joint Type: Exposed or concealed fasteners
4. Panel Coverage: 12” to 36’.
5. Panel Height: 1” to 2”.

2.6 METAL WALL PANELS
A. Tapered-Rib-Profile, Exposed-Fastener Metal Wall Panels Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

1. Material: Zinc-coated (galvanized) or Aluminum-zinc alloy-coated steel sheet, 0.22-inch (0.56-mm) nominal thickness.
   b. Color: As selected by Architect from manufacturer's full range.
2. Major-Rib Spacing: 12 inches (305 mm) o.c.
3. Panel Coverage: 36 inches (914 mm).
4. Panel Height: **1.125 inches (29 mm) minimum**

2.7 INTERIOR METAL LINER WALL PANELS

B. **Tapered-Rib-Profile**, Equivalent to MBCI 7.2 panel Exposed-Fastener Metal Wall Panels. Formed with raised, trapezoidal major ribs and **intermediate stiffening ribs symmetrically spaced** between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

1. Material: **Zinc-coated (galvanized) or Aluminum-zinc alloy-coated** steel sheet, 26ga minimum nominal thickness.
   a. Exterior Finish: **Two-coat fluoropolymer minimum**.
   b. Color: **As selected by Architect from manufacturer's full range**.

2. Major-Rib Spacing: 7.2 inches +/- o.c.
3. Panel Coverage: **36 inches +/-**.
4. Panel Height: **1.5 inches +/-**.

2.8 INSULATION MATERIALS ROOF AND EXTERIOR WALLS: Insulation system shall be equivalent to CGI Silvercoat.

2.9 Glass-Fiber-Blanket Insulation: ASTM C 991, Type I, or NAIMA 202 thermal insulation of 0.5-lb/cu. ft. (8-kg/cu. m) density, thickness as indicated, with a flame-spread index of 25 or less, and with 2-inch- (50-mm-) wide, continuous, vapor-tight edge tabs.

A. Vapor-Retarder Facing: ASTM C 1136.
   2. Permeance: Not greater than 0.02 perm (1.15 ng/Pa x s x sq. m) when tested according to ASTM E 96, Desiccant Method.

B. Retainer Strips: 0.019-inch- (0.5-mm-) thick, formed, galvanized steel or PVC retainer clips colored to match insulation facing.

2.10 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.

   1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

C. Flashing and Trim: Formed from 0.022-inch (0.56-mm) nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match adjacent metal panels.

2.11 SOURCE QUALITY CONTROL

A. Special Inspector: Contractor is to engage a qualified special inspector, approved by the owner/architect to perform the following tests and inspections and to submit reports. The cost of this special inspection will be deducted from the special inspection allowance. Special inspector will verify that manufacturer maintains detailed fabrication and quality-control procedures and will review the completeness and adequacy of those procedures to perform the Work.

1. Special inspections will provide the required inspections as defined by the 2006 IBC. For the on-site erection of the metal building components

2.12 FABRICATION

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

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

2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.


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

D. Secondary Framing: Shop fabricate framing components to size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
PART 3 - EXECUTION

3.1 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

   1. Set plates for structural members on wedges, shims, or setting nuts as required.
   2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
   3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
   1. Level and plumb individual members of structure.
   2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
   1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for bolt type and joint type specified.
      a. Joint Type: Snug tightened or pretensioned.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
   1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
   2. Locate and space wall girts to suit openings such as doors and windows.
   3. Locate canopy framing as indicated.
4. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
   1. Tighten rod and cable bracing to avoid sag.
   2. Locate interior end-bay bracing only where indicated.

I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.2 METAL PANEL INSTALLATION, GENERAL

A. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
   1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
      a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.
   2. Install metal panels perpendicular to structural supports unless otherwise indicated.
   3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
   4. Locate and space fastenings in uniform vertical and horizontal alignment.
   5. Locate metal panel splices over, but not attached to, structural supports with end laps in alignment.
   6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

B. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
   1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants recommended by metal panel manufacturer.

1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

3.3 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.

1. Install ridge and hip caps as metal roof panel work proceeds.
2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws. All flashings shall match the color of the adjacent surface color.

B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

1. Install clips to supports with self-drilling or self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
4. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
5. Rigidly fasten eave end of metal roof panels and allow ridge end free movement due to thermal expansion and contraction. Predrill panels for fasteners.
6. Provide metal closures at peaks, rake edges, rake walls and each side of ridge and hip caps.

C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

3.4 METAL SOFFIT PANEL INSTALLATION

A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.

B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

METAL BUILDING SYSTEMS
3.5 THERMAL INSULATION INSTALLATION

A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.

1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.

B. Blanket Roof Insulation: Comply with the following installation method:

1. Two-Layers-between-Purlin-with-Spacer-Block Installation: Extend insulation full depth of purlins, fabricate to match the purlin spacing shown on the metal building shop drawings. Run the vapor-retarder barrier continuously under the roof purlin, overlapping adjoining facing, held inplace with retainer strips bands and crossbands. Install top layer of filler insulation over roof purlins running perpendicular to the prulin. The top layer of insulation shall be 1” thicker than the roof clips holding the roofing sheets in-place.
   a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.

2. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

3.6 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed 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 weather resistant.

1. Install exposed flashing and trim 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.

2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

C. Roof Curbs: Install curbs at locations indicated on Drawings. Install flashing around bases where they meet metal roof panels.

D. Pipe Flashing: Form flashing around pipe penetration and metal roof panels. Fasten and seal to panel as recommended by manufacturer.

E. Product will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION 13125
## TABLE OF CONTENTS

**DIVISION 15 - MECHANICAL**

**SECTION 15A - GENERAL REQUIREMENTS**

15A-1 CONTRACT DOCUMENTS............................................................................................................. 1
15A-2 SPECIFICATION FORM AND DEFINITIONS.................................................................................. 1
15A-3 GENERAL EXTENT OF WORK ..................................................................................................... 1
15A-4 LOCAL CONDITIONS .................................................................................................................... 1
15A-5 CODES, ORDINANCES, RULES, AND REGULATIONS............................................................... 2
15A-6 CONTRACT CHANGE .................................................................................................................. 3
15A-7 LOCATIONS AND INTERFERENCES ........................................................................................... 4
15A-8 SYSTEM PERFORMANCE ........................................................................................................... 4
15A-9 WARRANTY ................................................................................................................................. 4
15A-10 MATERIALS, EQUIPMENT, AND SUBSTITUTIONS................................................................. 4
15A-11 SHOP DRAWINGS, OPERATION, AND MAINTENANCE INSTRUCTION .................................. 5
15A-12 CAD FILE REQUESTS .............................................................................................................. 6
15A-13 PROPOSED VALUE ENGINEERING/PROJECT SCOPE REVISIONS ....................................... 7
15A-14 CUTTING AND PATCHING ...................................................................................................... 7
15A-15 MUTILATION ............................................................................................................................ 7
15A-16 EXCAVATION AND BACKFILL ............................................................................................... 7
15A-17 SETTING, ADJUSTMENT, AND EQUIPMENT SUPPORTS ......................................................... 8
15A-18 START-UP, CHANGE-OVER, TRAINING, AND OPERATIONAL CHECK ................................. 8
15A-19 PAINTING OF MATERIALS AND EQUIPMENT ..................................................................... 8
15A-20 MAINTENANCE OF SYSTEMS ................................................................................................. 8
15A-21 FILTERS .................................................................................................................................... 8
15A-22 CLEANING OF HVAC SYSTEM AND EQUIPMENT ................................................................. 8
15A-23 STERILIZATION OF DOMESTIC WATER SYSTEM ................................................................. 9
15A-24 PIPE SLEEVES ....................................................................................................................... 9
15A-25 WELDING ............................................................................................................................... 10
15A-26 PIPING MATERIALS AND FITTINGS ....................................................................................... 10
15A-27 PIPE FITTINGS ....................................................................................................................... 12
15A-28 UNIONS ................................................................................................................................... 13
15A-29 PIPING INSTALLATION .......................................................................................................... 13
15A-30 VALVES AND INSTALLATION ................................................................................................. 15
15A-31 VALVES ................................................................................................................................... 15
15A-32 PIPE HANGERS AND SUPPORTS ............................................................................................ 16
15A-33 EQUIPMENT ANCHORS ........................................................................................................... 19
15A-34 CONCRETE INSERTS AND ANCHORS .................................................................................. 19
15A-35 TESTING PROCEDURES ......................................................................................................... 19
15A-36 PIPING PROTECTIVE COATING .............................................................................................. 20
15A-37 PIPING AND EQUIPMENT INSULATION ............................................................................... 20
15A-38 DUCTWORK INSULATION ..................................................................................................... 23
15A-39 ELECTRICAL REQUIREMENTS ............................................................................................. 24
15A-40 RECORD DOCUMENTS ......................................................................................................... 24
# DIVISION 15 - MECHANICAL

## SECTION 15B - PLUMBING, HEATING, VENTILATING AND AIR CONDITIONING

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>15B-1</td>
<td>PIPING SYSTEMS MATERIALS</td>
<td>1</td>
</tr>
<tr>
<td>15B-2</td>
<td>PIPING SYSTEMS VALVES</td>
<td>1</td>
</tr>
<tr>
<td>15B-3</td>
<td>PIPING SYSTEM INSULATION</td>
<td>1</td>
</tr>
<tr>
<td>15B-4</td>
<td>DUCTWORK INSULATION</td>
<td>1</td>
</tr>
<tr>
<td>15B-5</td>
<td>SCHEDULE OF FIXTURE BRANCHES</td>
<td>2</td>
</tr>
<tr>
<td>15B-6</td>
<td>ADJUSTMENT AND BALANCING</td>
<td>2</td>
</tr>
<tr>
<td>15B-7</td>
<td>DRAINS, FLOOR SINKS, DOWNSPOUT NOZZLES, ETC.</td>
<td>2</td>
</tr>
<tr>
<td>15B-8</td>
<td>CLEANOUTS</td>
<td>3</td>
</tr>
<tr>
<td>15B-9</td>
<td>HYDRANTS</td>
<td>3</td>
</tr>
<tr>
<td>15B-10</td>
<td>SHOCK ABSORBERS</td>
<td>3</td>
</tr>
<tr>
<td>15B-11</td>
<td>PLUMBING FIXTURES</td>
<td>3</td>
</tr>
<tr>
<td>15B-12</td>
<td>WATER HEATER</td>
<td>4</td>
</tr>
<tr>
<td>15B-13</td>
<td>BACKFLOW PREVENTORS</td>
<td>4</td>
</tr>
<tr>
<td>15B-14</td>
<td>OPENINGS</td>
<td>4</td>
</tr>
<tr>
<td>15B-15</td>
<td>ACCESS PANELS</td>
<td>5</td>
</tr>
<tr>
<td>15B-16</td>
<td>SHEET METAL WORK</td>
<td>5</td>
</tr>
<tr>
<td>15B-17</td>
<td>SHEET METAL SPECIALTIES</td>
<td>6</td>
</tr>
<tr>
<td>15B-18</td>
<td>GRILLES, REGISTERS, AND DIFFUSERS</td>
<td>8</td>
</tr>
<tr>
<td>15B-19</td>
<td>EXHAUST FANS</td>
<td>9</td>
</tr>
<tr>
<td>15B-20</td>
<td>GAS VENT PIPING</td>
<td>9</td>
</tr>
<tr>
<td>15B-21</td>
<td>TESTING AND BALANCING PREPARATION</td>
<td>9</td>
</tr>
<tr>
<td>15B-22</td>
<td>AIR AND WATER SYSTEM TESTING AND BALANCING</td>
<td>11</td>
</tr>
</tbody>
</table>
DIVISION 15 - MECHANICAL

SECTION 15C - FIRE SPRINKLER SYSTEM

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>15C-1</td>
<td>GENERAL</td>
<td>1</td>
</tr>
<tr>
<td>15C-2</td>
<td>SCOPE</td>
<td>1</td>
</tr>
<tr>
<td>15C-3</td>
<td>FEES AND PERMITS</td>
<td>1</td>
</tr>
<tr>
<td>15C-4</td>
<td>CAD FILE REQUESTS</td>
<td>1</td>
</tr>
<tr>
<td>15C-5</td>
<td>PROTECTION OF WORK</td>
<td>1</td>
</tr>
<tr>
<td>15C-6</td>
<td>SUBMITTALS AND APPROVALS</td>
<td>1</td>
</tr>
<tr>
<td>15C-7</td>
<td>CODES AND ORDINANCES</td>
<td>2</td>
</tr>
<tr>
<td>15C-8</td>
<td>ACCEPTABLE MANUFACTURERS</td>
<td>2</td>
</tr>
<tr>
<td>15C-9</td>
<td>QUALIFICATION OF SPRINKLER CONTRACTOR</td>
<td>2</td>
</tr>
<tr>
<td>15C-10</td>
<td>WATER SERVICE</td>
<td>2</td>
</tr>
<tr>
<td>15C-11</td>
<td>TESTING AND FLUSHING OF SYSTEM</td>
<td>2</td>
</tr>
<tr>
<td>15C-12</td>
<td>EQUIPMENT AND MATERIALS</td>
<td>2</td>
</tr>
<tr>
<td>15C-13</td>
<td>SPRINKLER HEADS</td>
<td>3</td>
</tr>
<tr>
<td>15C-14</td>
<td>DESIGN AND CALCULATION</td>
<td>3</td>
</tr>
<tr>
<td>15C-15</td>
<td>FIRE DEPARTMENT CONNECTION</td>
<td>3</td>
</tr>
<tr>
<td>15C-16</td>
<td>MISCELLANEOUS EXECUTION</td>
<td>3</td>
</tr>
<tr>
<td>15C-17</td>
<td>ELECTRICAL REQUIREMENTS</td>
<td>4</td>
</tr>
<tr>
<td>15C-18</td>
<td>FIRE PUMP CONTROLLER</td>
<td>4</td>
</tr>
<tr>
<td>15C-19</td>
<td>INSPECTIONS AND TESTING</td>
<td>4</td>
</tr>
</tbody>
</table>
DIVISION 15 – MECHANICAL

SECTION 15A – GENERAL REQUIREMENTS

15A-1 CONTRACT DOCUMENTS:

a) All contract documents including drawings, alternates, addenda, and modifications preceding this Specification Division are applicable to Mechanical Contractor and his subcontractors and material suppliers.

15A-2 SPECIFICATION FORM AND DEFINITIONS:

a) These Specifications are abbreviated form and contain incomplete sentences. Omissions of words or phrases such as “the Contractor shall,” “shall be,” “as noted on the drawings,” “according to the drawings,” “a,” “an,” “the,” and “all” are intentional. Omitted words and phrases shall be supplied by inference.

b) When a word such as “proper,” “satisfactory,” “equivalent,” and “as directed” is used, it requires Engineer’s review.

c) “Provide” means furnish and install.

d) “Working Day” wherever used in these Specifications, shall mean the normal working days Monday through Friday, exclusive of Saturday, Sunday, and federally observed holidays.

e) Architect/Engineer hereinafter abbreviated A/E shall mean both the Design Architects and the Design Engineers.

f) Design Engineer hereinafter abbreviated D/E shall mean the engineering firm, RTM Engineering Consultants, LLC 9225 Indian Creek Pkwy, Suite 1075, Overland Park, KS 66210, Telephone (913) 322-1400. Contact Person: April Halling.

g) General Contractor hereinafter abbreviated G/C shall mean the person or company and their subcontractors who enter into contract with the Owner to perform the general division work.

h) Electrical Contractor hereinafter abbreviated E/C shall mean the person or company and their subcontractors who enter into contract with the G/C to perform the electrical division work.

i) Mechanical Contractor hereinafter abbreviated M/C shall mean the person or company and their subcontractors who enter into contract with the G/C to perform the mechanical division work.

j) Equipment and/or materials manufacturer hereinafter abbreviated E/M shall mean the manufacturer of equipment or materials specified or referred to.

15A-3 GENERAL EXTENT OF WORK:

a) Provide mechanical systems indicated on drawings, specified or reasonably implied. Provide every device and accessory for proper operation and completion of mechanical systems. In no case will claims for “Extra Work” be allowed for work about which M/C could have informed himself before bids were taken.

b) M/C shall familiarize himself with equipment provided by other contractors, which require mechanical connections and controls.

15A-4 LOCAL CONDITIONS:

a) Visit site and determine existing local conditions affecting work in contract.
b) Failure to determine site conditions or nature of existing or new construction will not be considered a basis for granting additional compensation.

15A-5 CODES, ORDINANCES, RULES, AND REGULATIONS:

a) Provide work in accordance with applicable codes, rules, ordinances, and regulations of Local, State, and Federal Governments and other Authorities Having lawful Jurisdiction (AHJ).

b) Conform to latest editions and supplements of the following codes, standards, or recommended practices as adopted by the AHJ.

1. CITY CODES:
   B. 2006 Uniform Mechanical Code.

2. SAFETY CODES:
   B. Occupational Safety and Health Standards – Department of Labor.
   C. Specifications for Making Buildings and Facilities Accessible To, and Usable By, the Physically Handicapped – American Standards Institute ANSI A117.1.

3. NATIONAL FIRE CODES:
   A. NFPA No. 54 Gas Appliance and Gas Piping Code.
   C. NFPA No. 89M Clearances, Heat Producing Appliances.
   D. NFPA No. 90A Air Conditioning and Ventilation Systems.
   E. NFPA No. 91 Blower and Exhaust Systems.

c) Where following standards are applicable to equipment specified, equipment shall conform to requirements of standard and shall display the appropriate seal or seals:

1. AGA – The American Gas Association Laboratories.
2. ASME – American Society of Mechanical Engineers.
3. NSF – National Sanitation Foundation.
4. UL – Underwriters Laboratories Inc.

d) Drawings and Specifications indicate minimum construction standards, but should any work indicated be sub-standard to any ordinances, laws, codes, rules, or regulations bearing on work, Contractor
shall execute work in accordance with such ordinances, laws, codes, rules, or regulations without increased cost to Owner, but not until he has referred such variances to A/E for approval.

e) M/C shall secure and pay for necessary permits and certificates of inspection required by governmental ordinances, laws, rules, or regulations. Keep a written record of all permits and inspection certificates and submit two (2) copies to A/E with request for final inspection.

15A-6 CONTRACT CHANGE:

a) Changes or deviations from contract; including those for extra or additional work must be submitted in writing for review of A/E. No verbal orders will be recognized.

b) Changes in the work shall be submitted in accordance with AIA Document A201, General Conditions of the Contract for Construction.

c) All change proposals shall be itemized indicating separately the costs for materials, labor, restocking charges, freight, bonds, insurance, overhead, and profit. All materials shall be listed separately with quantities and individual unit prices. Labor factors shall be from a nationally recognized source with appropriate adjustment factors. If proposals are not itemized, they will be rejected and returned for proper submittal.

d) The maximum allowable profit for any change order shall be ten percent (10%).

e) See Example below:

<table>
<thead>
<tr>
<th>Material</th>
<th>Units</th>
<th>Unit Measure</th>
<th>Material Per Unit</th>
<th>Man Hours Per Unit</th>
<th>Total Man Hours</th>
<th>Material Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>6” tee</td>
<td>1</td>
<td>ea.</td>
<td>$45.00</td>
<td>2.000</td>
<td>2.0</td>
<td>$ 45.00</td>
</tr>
<tr>
<td>Less 6” ell</td>
<td>1</td>
<td>ea.</td>
<td>$30.00</td>
<td>0.000</td>
<td>0.0</td>
<td>$ 30.00</td>
</tr>
<tr>
<td>6” sch 40 pipe</td>
<td>15</td>
<td>ft.</td>
<td>$10.43</td>
<td>0.253</td>
<td>3.8</td>
<td>$ 66.46</td>
</tr>
<tr>
<td>6” cap</td>
<td>1</td>
<td>ea.</td>
<td>$11.00</td>
<td>1.500</td>
<td>1.5</td>
<td>$ 11.00</td>
</tr>
<tr>
<td>6” hanger</td>
<td>1</td>
<td>ea.</td>
<td>$12.00</td>
<td>0.400</td>
<td>0.4</td>
<td>$ 12.00</td>
</tr>
<tr>
<td>4” saddle weld</td>
<td>1</td>
<td>ea.</td>
<td>$0.00</td>
<td>1.200</td>
<td>1.2</td>
<td>$ 0.00</td>
</tr>
<tr>
<td>4” sch 40</td>
<td>18</td>
<td>ft.</td>
<td>$4.44</td>
<td>0.183</td>
<td>3.3</td>
<td>$ 79.92</td>
</tr>
<tr>
<td>4” ell</td>
<td>3</td>
<td>ea.</td>
<td>$13.39</td>
<td>2.000</td>
<td>6.0</td>
<td>$ 40.17</td>
</tr>
<tr>
<td>4” hanger</td>
<td>3</td>
<td>ea.</td>
<td>$8.00</td>
<td>0.300</td>
<td>0.9</td>
<td>$ 24.00</td>
</tr>
<tr>
<td>4” weld</td>
<td>1</td>
<td>ea.</td>
<td>$3.00</td>
<td>1.000</td>
<td>1.0</td>
<td>$ 3.00</td>
</tr>
<tr>
<td>1.5” cond sch 80</td>
<td>21</td>
<td>ft.</td>
<td>$1.63</td>
<td>0.080</td>
<td>1.7</td>
<td>$ 34.23</td>
</tr>
<tr>
<td>1.5” ell</td>
<td>3</td>
<td>ea.</td>
<td>$4.00</td>
<td>0.400</td>
<td>1.2</td>
<td>$ 12.00</td>
</tr>
<tr>
<td>1.5” tee</td>
<td>1</td>
<td>ea.</td>
<td>$5.00</td>
<td>0.600</td>
<td>0.6</td>
<td>$ 5.00</td>
</tr>
<tr>
<td>1.5” weld</td>
<td>1</td>
<td>ea.</td>
<td>$3.00</td>
<td>0.400</td>
<td>0.4</td>
<td>$ 3.00</td>
</tr>
<tr>
<td>0.75” F &amp; T trap</td>
<td>1</td>
<td>ea.</td>
<td>$73.00</td>
<td>0.500</td>
<td>0.5</td>
<td>$ 73.00</td>
</tr>
<tr>
<td>0.75” strainer</td>
<td>1</td>
<td>ea.</td>
<td>$12.00</td>
<td>0.500</td>
<td>0.5</td>
<td>$ 12.00</td>
</tr>
<tr>
<td>0.75” XH nipples</td>
<td>4</td>
<td>ea.</td>
<td>$7.70</td>
<td>0.100</td>
<td>0.4</td>
<td>$ 30.80</td>
</tr>
<tr>
<td>0.75” unions</td>
<td>2</td>
<td>ea.</td>
<td>$3.18</td>
<td>0.300</td>
<td>0.6</td>
<td>$ 6.36</td>
</tr>
<tr>
<td>0.75” cap</td>
<td>1</td>
<td>ea.</td>
<td>$0.65</td>
<td>0.100</td>
<td>0.1</td>
<td>$ 0.65</td>
</tr>
<tr>
<td>0.75” pipe sch 80</td>
<td>10</td>
<td>ft.</td>
<td>$0.72</td>
<td>0.400</td>
<td>0.4</td>
<td>$ 7.20</td>
</tr>
<tr>
<td>0.75” tee</td>
<td>1</td>
<td>ea.</td>
<td>$1.50</td>
<td>0.300</td>
<td>0.3</td>
<td>$ 1.50</td>
</tr>
<tr>
<td>0.75” ell</td>
<td>3</td>
<td>ea.</td>
<td>$0.95</td>
<td>0.200</td>
<td>0.6</td>
<td>$ 2.85</td>
</tr>
<tr>
<td>0.75” hanger</td>
<td>2</td>
<td>ea.</td>
<td>$2.50</td>
<td>0.200</td>
<td>0.4</td>
<td>$ 5.00</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28.74</td>
<td><strong>$618.47</strong></td>
</tr>
<tr>
<td><strong>SALES TAX</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.125%</td>
<td><strong>$37.88</strong></td>
</tr>
<tr>
<td><strong>LABOR</strong></td>
<td>28.4</td>
<td>MH</td>
<td><strong>$22.00</strong></td>
<td></td>
<td></td>
<td><strong>$624.80</strong></td>
</tr>
<tr>
<td><strong>5% OVERHEAD</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>$64.06</strong></td>
</tr>
<tr>
<td><strong>8% PROFIT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>$107.62</strong></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>$1,452.83</strong></td>
</tr>
</tbody>
</table>

**GENERAL REQUIREMENTS 15Ap 3**
15A-7 LOCATIONS AND INTERFERENCES:

a) Locations of equipment, piping, and other mechanical work are indicated diagrammatically by mechanical drawings. Determine exact locations on job, subject to structural conditions, work of other contractors, access requirements for installation and maintenance, and to approval of A/E.

b) Study and become familiar with contract drawings of other trades and in particular the general construction plans and details to obtain necessary information for figuring installation. Cooperate with other workmen and install work to avoid interference with their work. Minor deviations not affecting design characteristics, performance, or space limitations may be permitted if reviewed by A/E prior to installation.

c) Any pipe, apparatus, appliance, or other item interfering with proper placement of other work as indicated on drawings, specified, or required shall be removed and if so shown, relocated and reconnected without extra cost. Damage to other work caused by the Contractor, his subcontractor, or his workmen shall be restored as specified for new work.

d) Do not scale mechanical and electrical drawings for dimensions. Accurately lay out work from dimensions indicated on architectural drawings unless such is found in error.

15A-8 SYSTEM PERFORMANCE:

a) Final acceptance of work shall be subject to the condition that all systems, equipment, apparatus, and appliances operate satisfactorily as designed and intended; work shall include required adjustment of systems and control equipment installed under this Specification.

b) Contractor shall be responsible for all work as required by phasing of construction for intended use by the owner as applicable.

15A-9 WARRANTY:

a) M/C warrants to Owner and Architect the quality of materials, equipment, workmanship, and operation of equipment provided under this Specification Division for a period of one (1) year from and after date of substantial completion of building and acceptance of mechanical systems by Owner.

b) Where manufacturers’ warranties expire during the one (1) year warranty period, one (1) year warranty period is defined as year after date of substantial completion. M/C shall include provisions for extending warranty for the full one (1) year period and shall cost for warranty extension in his base bid.

c) M/C warrants to Owner and Architect that on receipt of written notice from either of them within one (1) year warranty period following date of acceptance, all defects that have appeared in materials and/or workmanship shall be promptly corrected to condition required by contract documents at M/C’s expense.

d) The above warranty shall not supersede any separately stated warranty or other requirements by law or by these Specifications.

e) If the Architect’s specification includes a warranty that exceeds the above warranty requirements, the Architect’s warranty shall take precedence.

15A-10 MATERIALS, EQUIPMENT, AND SUBSTITUTIONS:

a) The intent of these Specifications is to allow ample opportunity for M/C to use his ingenuity and abilities to perform the work to his and the Owner’s best advantage, and to permit maximum competition in bidding on standards of materials and equipment required.
b) Material and equipment installed under this contract shall be first class quality, new, unused, and without damage.

c) In general, these Specifications identify required materials and equipment by naming first the manufacturer whose product was used as the basis for the project design and Specifications. The manufacturer’s product, series, model, catalog, and/or identification numbers shall set quality and capacity requirements for comparing the equivalency of other manufacturer’s products. Where other manufacturer’s names are listed, they are considered an approved manufacturer for the product specified; however, the listing of their names implies no prior approval of any product they may propose to furnish as equivalent to the first named product unless specific model or catalog numbers are listed in these Specifications or in subsequent addenda. Where other than first named products are used for M/C’s base bid proposal, it shall be his responsibility to determine prior to bid time that his proposed materials and equipment selections are products of approved manufacturers, that will meet or exceed the Specifications and are acceptable to the D/E.

d) Where materials or equipment are described but not named, provide required items of first quality, adequate in every respect for intended use. Such items shall be submitted to A/E for review prior to procurement.

e) PRIOR TO RECEIPT OF BIDS, IF M/C WISHES TO INCORPORATE PRODUCTS OTHER THAN THOSE NAMED IN SPECIFICATIONS IN HIS BASE BID, HE SHALL SUBMIT A WRITTEN REQUEST FOR REVIEW OF SUBSTITUTIONS TO D/E NOT LESS THAN SEVEN (7) WORKING DAYS PRIOR TO BID TIME. D/E WILL REVIEW REQUESTS AND ACCEPTABLE ITEMS WILL BE LISTED IN AN ADDENDUM ISSUED TO PRINCIPAL BIDDERS.

f) Materials and equipment proposed for substitutions shall be equal to or superior to that specified in construction, efficiency, utility, aesthetic design, and color as determined by A/E, whose decision shall be final and without further recourse. Physical size of substitute brand shall be no larger than space provided including allowances for access for installation and maintenance. Requests must be accompanied by two (2) copies of complete descriptive and technical data including E/M’s name, model, and catalog number, photographs or cuts, physical dimensions, operating characteristics, and any other information needed for comparison.

g) In proposing a substitution prior to or subsequent to receipt of bids, include in such proposal cost of altering other elements of project, including adjustments in mechanical/electrical service requirements necessary to accommodate such substitution; whether such affected elements are under this contract or under separate contracts.

h) Within seven (7) working days after bids are received, apparent lower bidder shall submit to A/E for approval three (3) copies of a list of all major items of equipment he intends to provide. As soon as practicable and within 30 working days after award of contract, M/C shall submit shop drawings for equipment and materials to be incorporated in work, for A/E review. Where 30 day limit is insufficient for preparation of detailed shop drawings on major equipment or assemblies, M/C shall submit manufacturer’s descriptive catalog data and indicate date such detailed shop drawings will be submitted along with manufacturer’s certification that order was placed within 30 working day limit.

i) After execution of contract, substitution of product brands for those named in Specifications will be considered, only if; 1) request is received within 30 days after contract date and request includes statement showing credit due Owner, if any, if substitution products are used, or 2) Owner requests consideration be given to substitute brands.

15A-11 SHOP DRAWINGS, OPERATION, AND MAINTENANCE INSTRUCTION:

a) Unless noted differently in the general requirements of the specifications, M/C shall furnish the following option:

1. Electronic PDF submittals to the Architect. Shop drawings submitted electronically shall be returned electronically via the same path.
Where catalog cuts are submitted for review, conspicuously mark or provide schedule of equipment, capacities, controls, fittings, sizes, etc. that are to be provided. Mark each submitted item with applicable section and paragraph numbers of these Specifications, or plan sheet number, when item does not appear in Specifications. Where equipment submitted does not appear in base Specifications of specified equivalent, mark submittals with applicable alternate numbers, change order numbers, or letters of authorization. Each submittal shall contain at least two (2) sets of original catalog cuts. Each catalog sheet shall bear E/M’s name and address. All shop drawings on materials and equipment listed by UL shall indicate UL approval on submittal.

c) M/C shall check all shop drawings to verify that they meet specifications and/or drawing requirements before forwarding submittals to the A/E for their review. All shop drawings submitted to A/E shall bear M/C approval stamp which shall indicate that M/C has reviewed submittals and that they meet Specification and/or drawing requirements. M/C’s submittal review shall specifically check for, but not limited to, the following: equipment capacities, physical size in relation to space allowed; electrical characteristics, provisions for supply, return, and drainage connections to building systems. All shop drawings not meeting M/C’s approval shall be returned to his supplier for resubmittal.

d) No shop drawing submittals will be considered for review by the A/E without M/C’s approval stamp, or that have extensive changes made on the original submittal as a result of Contractor’s review. All comments or minor notations on shop drawings shall be flagged as follows to indicate originator of comment or notation: 1 Contractor, 2 Construction Manager, 3 Architect, and 4 Engineer.

e) A/E will not be responsible for the cost of returning shop drawing submittals that are submitted to them without M/C’s review and approval stamp. A letter will be sent to M/C by either the Architect or Engineer indicating receipt of an improper submittal. P/C shall acknowledge receipt of letter and indicate his plans for pick-up or resubmitting. A/E will hold improper submittals for pick-up by M/C or supplier for 15 working days after date of receipt. If not picked up by the 16th working day, submittals will be disposed of by A/E.

f) A/E’s review of shop drawings will not relieve M/C of responsibility for deviations from drawings and specifications unless such deviations have been specifically approved in writing to Owner or his representative, nor shall it relieve M/C of responsibility for errors in shop drawings. No work shall be fabricated until A/E’s review has been obtained. Any time delay caused by correcting and resubmitting shop drawings will be M/C’s responsibility.

a) Operating and Maintenance Instructions:

1. Submit with shop drawings of equipment: copies of installation, operating, maintenance instructions, and parts list for equipment provided. Instructions shall be prepared by E/M.

2. Keep in safe place keys and wrenches furnished with equipment under this contract. Present to Owner and obtain a receipt for same upon completion of project.

3. Contractor shall provide all final documents including drawings, shop drawings, etc. in PDF format on a single disk to Owner. A total of five (5) CD’s shall be provided, three (3) to the Owner and two (2) to A/E. No exceptions will be allowed to this requirement. Videotaping, as specified in other parts of this Specification, will also be required at closeout.

15A-12 CAD FILE REQUESTS:

a) CAD files (only where created as part of the project design) are the property of the D/E and are only available upon documented written request. The contractor must sign a Third-Party User Agreement and Drawing Request Form which must be forwarded to the D/E office prior to any CAD files being released. This form is available from the D/E upon request.
15A-13 PROPOSED VALUE ENGINEERING/PROJECT SCOPE REVISIONS:

b) Where design revisions are requested/required based on value-engineering or proposed changes in project scope, the contractor shall include in his proposed cost savings or adds the necessary MEP design fees that are required for modifying construction documents and associated meetings. To determine that value to be included, the contractor shall submit to the A/E the proposed scope of the work required for the changes at least 7 days prior to required pricing submittal so that the design fees can be accurately determined and included. Design work and drawing changes will only commence once the design fee is established and a signed agreement returned to the A/E for inclusion.

c) Where the contractor proposes to use different equipment that results in significant difference in routing or space considerations than shown in the construction documents, the contractor shall include the necessary MEP design fees that are required for modifying or creating construction drawings necessary either for construction or submission to the authority having jurisdiction and required for additional review. Design work and drawing changes will only commence once the design fee is established and a signed agreement returned to the A/E for inclusion.

15A-14 CUTTING AND PATCHING:

a) M/C shall do cutting and patching of building materials required for installation of work herein specified. Cut no structural members without Architect’s approval and in a manner approved by him.

b) Patching shall be by mechanics of particular trade involved and shall meet approval of Architect.

c) Drilling and cutting of openings through building materials requires Architect’s review and approval. Make openings in concrete with concrete hole saw or concrete drill. Do not use star drill or air hammer for this work.

15A-15 MUTILATION:

a) Mutilation of building finishes, caused by installation of mechanical equipment, fixtures, piping, and other mechanical devices shall be repaired at M/C’s expense to approval of Architect.

15A-16 EXCAVATION AND BACKFILL:

a) Perform necessary excavating to receive work. Provide necessary sheathing, shoring, cribbing, tarpaulins, etc. as required and remove same at completion of work. Perform excavation in accordance with appropriate section of these Specifications, and in compliance with OSHA Safety Standards.

b) Excavate trenches of sufficient width to allow ample working space, and a minimum of 6", and no deeper than necessary, for installation work.

c) Conduct excavations so no walls or footings are disturbed or injured. Backfill excavations made under or adjacent to footings with selected earth or sand and tamp to compaction required by A/E. Mechanically tamp backfill under concrete and paving in 6-inch layers to 95 percent standard density.

d) Backfill trenches and excavations to required heights with allowance made for settlement. Tamp fill material thoroughly and moisten as required for specified compaction density. Dispose of excess earth, rubble, and debris as directed by Architect.

e) When available, refer to test-hole information on Architectural drawings or specifications for types of soil to be encountered in excavation in base bid.

f) Trenches shall be installed to have a bedding of natural or artificial graded fixture of crushed gravel or sand with 100% passing a 1-inch sieve and not more than 8% passing a #200 sieve. All depressions
shall be filled with tamped and sand backfill. Place and compact backfill of sub-base material free of particles larger than 1” over piping. Compact each 6” layer at 85% density. Install warning tape directly above piping outside the building at 12” below grade.

g) All buried PVC DWV piping systems shall be installed in accordance with ASTM D 2321. Submit pictures of the underground pipe installation to the design engineer prior to backfilling.

15A-17 SETTING, ADJUSTMENT, AND EQUIPMENT SUPPORTS:

a) Work shall include mounting, alignment, and adjustment of systems and equipment.

b) Set equipment level on adequate foundations and provide proper anchor bolts and isolation as shown, specified, or required by E/M’s installation instructions.

c) Provide concrete bases for all floor and slab mounted equipment. Refer to drawings for required base type and size. Provide 3.5-inch high base where base is not shown on drawings.

15A-18 START-UP, CHANGE-OVER, TRAINING, AND OPERATIONAL CHECKS:

a) M/C shall perform initial start-up of systems and equipment and shall provide necessary supervision and labor to make first seasonal changeover of systems. Personnel qualified to start-up and service this equipment, including E/M’s technicians, when specified, and Owner’s operating personnel shall be present during these operations.

15A-19 PAINTING OF MATERIALS AND EQUIPMENT:

a) Equipment and materials exposed to interior dry environment shall have a minimum of one (1) primer and one (1) finish coat. Equipment and materials mounted in exterior location shall have a minimum of one (1) primer and two (2) finish coats with total thickness of at least 5 mils. Finish coat colors in finish areas shall be as selected by A/E.

b) After installation, damage to painted surfaces shall be properly prepared and primed with primers equal to factory materials. Finish coating shall be same color and type as factory finish.

c) Where extensive refinishing of factory applied finishes are required, equipment shall be completely repainted. A/E will make final determination of extent of refinishing required.

d) Paint all exterior natural gas/propane piping with one (1) primer coat and two (2) finish coats.

15A-20 MAINTENANCE OF SYSTEMS:

a) M/C shall be responsible for operation, maintenance, and lubrication of equipment installed under his contract.

15A-21 FILTERS:

a) Provide temporary throw-away filters in all permanent heating and air conditioning equipment systems being utilized during construction. Prior to testing and balancing systems, remove temporary filter media and install clean unused filters of the type specified. Clean filters shall be installed in equipment for final acceptance inspection by A/E.

b) Unless shown or specified otherwise, provide Farr 30-30 filters. MERV 7 minimum filter efficiency.

15A-22 CLEANING OF HVAC SYSTEM AND EQUIPMENT:

a) After pressure testing of systems and equipment and before operational test, thoroughly clean interiors of piping and equipment.
b) Clean equipment as recommended by manufacturers. Where specific instructions are not provided by equipment manufacturer, clean equipment systems as follows:

1. Air Handling System: Before starting any air system, clean all debris, foreign matter, and construction dirt from air system and fan. Provide equipment requiring filters, such as air handling units, fan coil units, blowers, etc. with throwaway filters specified under this Specification. After cleaning air system, install temporary filters and run continuously for eight (8) hours at full volume. Replace temporary filters immediately prior to testing and balancing.

15A-23 STERILIZATION OF DOMESTIC WATER SYSTEM:

a) After final pressure testing of distribution system, thoroughly flush entire system with water until free of dirt and construction debris. Fill system with solution of liquid chlorine or hypochlorite of not less than 50 ppm. Retain treated water in system until tests indicate non spore-forming bacteria have been destroyed or for 24 hours, whichever is greater.

b) All points in system shall have at least 10 ppm of solution at end of retention period.

c) When time and concentration have been met, drain system and flush with fresh domestic water until residual cleaning solution is less than 1.0 ppm. Open and close each value in system six (6) times during flushing operation.

d) Test samples taken from several points in system shall indicate absence of pollution for 48 hours. Repeat sterilization as required. Acceptance of system will not be given until satisfactory bacteriological results are obtained.

15A-24 PIPE SLEEVES:

a) Provide proper type and size pipe sleeves and install in walls or floors and where otherwise noted. Sleeves are not required for supply and waste piping through wall supporting plumbing fixtures or for cast iron soil pipe passing through concrete slab on grade except where penetrating a membrane waterproof floor.

b) Each sleeve shall be continuous through wall, floor, or roof and shall be cut flush on each side except where indicated otherwise. Sleeves shall not be installed in structural member except where indicated or approved. Sleeves shall be required through floors subject to flooding such as toilet rooms, equipment rooms, and kitchens. The contractor shall have the option of:

1. Providing a cast iron sleeve with integral flanges extending 1-inch above finished floor. Sleeve shall be cast in concrete when floor is poured. Annular space between sleeve and pipe shall be filled with Kaowool.

or

2. Provide core-drilled opening in concrete with Thunderline Link-Seal or Calpico Sealing Linx between piping and opening.

c) Sleeves passing through floors with waterproof membranes shall be core-drilled and sealed with Thunderline Link-Seal or Calpico Sealing Linx.

d) Sleeves passing through walls with waterproof membranes shall be sealed with Thunderline Link-Seal or Calpico Sealing Linx.

e) Pipe insulation shall run continuous through pipe sleeves with 0.25-inch minimum clearance between insulation and pipe sleeve. Provide metal jackets over insulated pipes passing through fire walls, floors, and smoke partitions. Jacket shall be 0.018 stainless steel extending 12 inches on either side of barrier and secured to insulation with 0.375-inch-wide band. Provide Kaowool fire master bulk packing between sleeve and metal jacket. Packing thickness shall be sized per manufacturer's
i) Camp Aldrich New Trails Cabin
j) Claflin, KS

recommendation for maintaining the integrity of the fire wall/floor or smoke partition. Fire protection system shall be rated per ASTM E 119. Equivalents to Kaowool are 3M, Flame Stop, or Flame Safe.

f) Where piping passes through walls serving as air plenums or chases, seal annular space between pipe and sleeve air tight with Kaowool Firemaster Bulk Packing.

15A-25 WELDING:

a) Contractor shall be responsible for quality of welding and suitability of welding procedures. All welding shall be in accordance with American Welding Society AWS B3.0 and ANSI B31.1.

b) Welding shall be done only by welders who have successfully passed welder qualification tests in previous 12 months for type of welding required. Each welder shall identify his work with a code marking before starting any welded pipe fabrication. Contractor shall submit three (3) copies of a list of welders who will work on project listing welder’s code, date, and types of latest qualification tests passed by each welder.

c) Welded joints shall be fusion welded in accordance with Level AR3 of AWS D10.9 “Standard for Qualification of Welding Procedures and Welders for Pipe and Tubing.” Welders qualified under National Certified Pipe Welding Bureau will be acceptable.

d) Bevel all piping and fittings in accordance with recognized standards by flame cutting or mechanical means. Align and position parts so that branches and fittings are set true. Make changes in direction of piping systems with factory made welding fittings. Make branch connections with welding tees or forged welloots.

15A-26 PIPING MATERIALS AND FITTINGS:

a) Piping used throughout project shall conform to the following specifications. Piping shall be plainly marked with manufacturer’s name and weight. All materials listed may not be required on this project. See piping material schedules, on drawings, for materials to be used for each piping system. Piping materials shall be as follows:

1. Hubless Cast Iron Soil Pipe:
   A. Pipe and fittings shall be gray cast iron with spigot bead and positioning lug. Pipe and fittings shall be coated inside and out with asphaltum preservative and shall meet requirements of current CISPI 301-69T.
   B. Pipe joints shall be no-hub joint couplings consisting of neoprene rubber sleeve, stainless steel shield, and clamp assembly.
   C. Pipe and fittings by Tyler Pipe, Charlotte, Central Foundry, or Wheatland Tube Company.
   D. All cast iron soil pipe and fittings shall be marked with the Collective Trademark of CISPI and listed by NSF International.

2. Carbon Steel Pipe (0.125 inches through 2.5 inches):
   A. Provide continuous weld or electric resistance welded carbon steel pipe conforming to ASTM A 120 or A 53, as scheduled.
   B. Pipe joints shall be threaded conforming to ANSI B2.1, beveled for welding or grooved for use with Victaulic couplings.
   C. Pipe by Armco, Youngstown, United States Steel, or equal.
3. Carbon Steel Pipe (3 inches and above):
   A. Provide seamless continuous or electric weld carbon steel pipe conforming to ASTM A 120 or A 53, as scheduled.
   B. Pipe ends shall be beveled for welding or grooved for use with Victaulic couplings.
   C. Pipe by Armco, Youngstown, United States Steel, or equal.

4. Polyvinyl Chloride (PVC) Pipe:
   A. Provide Type 1, Grade 1 PVC pipe conforming to requirements of current ASTM D 1785 for pressure piping as scheduled. Pipe shall be approved by NSF for potable water.
   B. Provide Type 1, Grade 1 PVC pipe conforming to requirements of current ASTM D 2665 for DWV piping as scheduled. Cellular core PVC piping will not be approved.
   C. Piping for pressure piping shall have plain ends for socket type fittings.
   D. Pipe by Chemtrol, Charlotte, Tyler, Pipelife, Cabot, or equal.

5. Copper Tube:
   A. Provide hard temper copper water tube conforming to requirements of current ASTM B 88. Tubing shall be Type K, L, or M as listed in schedule.
   B. Tubing joints shall be soldered or brazed. See schedule for joining method to be used.
   C. Pipe by Cerro, Chase, Mueller, Revere Copper, or equal.

6. Copper Tube Type ACR:
   A. Provide hard or annealed temper nitrogenized copper refrigerant tube conforming to requirements of current ASTM B 280. Tubing 2” and larger shall be hard temper.
   B. Tubing joints shall be brazed or grooved joints shall be manufactured to copper-tube dimensions. (Flaring tube endings to accommodate alternate sized couplings is not allowed.)
   C. Pipe by Cerro, Mueller, or equal.

7. Cross-linked Polyethylene PEX:
   A. Provide cross-linked polyethylene (PEX) tubing and ASTM F1960 cold expansion fittings conforming to the requirements of ASTM F876 and F877 and ANSI standards 14 and 61. Fittings shall comply with ASTM F1960.
   B. Standard grade hydrostatic pressure ratings from Plastics Pipe Institute (PPI) in accordance with TR-3 as listed in TR-4. The following three standard-grade hydrostatic ratings are required
      i. 200°F (93°C) at 80 psi (551 kPa)
      ii. 180°F (82°C) at 100 psi (689 kPa)
      iii. 73.4°F (23°C) at 160 psi (1,102 kPa)
C. All horizontal tubing hangers and riser clamps shall be epoxy-coated with clips supplied by the tubing manufacturer with minimum of 32” horizontal and 60” vertical. Protect all tubing with sleeves or grommets through masonry or metal studs.

D. All piping shall be installed as required by the PEX tubing manufacturer with minimum horizontal supports installed not less than 32” apart. Maintain clearance distances as recommended with min of 18” from water heaters and 12” from light fixtures.

E. Fittings shall be compatible with industry standard connections. Tubing by Wirsbo, Watts, Uponor, Zurn and Viega.

15A-27 PIPE FITTINGS:

a) Pipe fittings used throughout project shall be proper type for installation method used and shall be compatible with piping system materials. Fittings listed in piping material schedule shall conform to the following specifications:

1. Carbon Steel Welding Fittings:
   A. Provide carbon low alloy seamless steel welding fittings conforming to current ANSI B16.9 and ASTM A 234.
   B. Fittings by Grinnell, Midwest, or equal.

2. Branch Connection Welding Fittings:
   A. Provide carbon steel weldolet fittings conforming to ANSI B16.9, B16.11, B31.1.0, and ASTM A 105, Grade 11.
   B. Fittings by Bonney Forge or equal.

3. Branch Connection Welding to Screwed Fitting:
   A. Provide carbon steel threadolet fitting conforming to ANSI B16.9, B16.1.1, B31.1, and ASTM A 105, Grade 11.
   B. Fittings by Bonney Forge or equal.

4. Carbon Steel Flanges:
   A. Provide carbon steel flanges conforming to ASTM A 181, Grade 1 and ANSI B16.5
   B. Flanges by Grinnell, Midwest, or equal.

5. Malleable Iron Screwed Fittings:
   A. Provide screwed malleable iron fittings conforming to ANSI B16.3, B2.1, and ASTM A 47, Grade 32510.
   B. Fittings by Crane, Grinnell, Stockham, or equal.

6. Wrought Copper Fittings:
   A. Provide wrought solder joint copper tube fitting conforming to ANSI B16.22.
   B. Fittings by Chase, Nibco, or equal.
7. Cast Bronze Fittings:
   A. Provide cast bronze solder joint fittings conforming to ANSI B16.18.
   B. Fittings by Chase, Nibco, or equal.

8. PVC, DWV Fittings:
   A. Provide PVC, DWV socket fittings conforming to ASTM D 3311 and D 2661.
   B. Solvent cement of socket fittings shall conform to ASTM D 2235.
   C. Fittings by Chemtrol, Charlotte, Tyler, or equal.

9. PEX Fittings:
   B. Manifold: Multiple-outlet, plastic or corrosion-resistant-metal assembly complying with ASTM F 877; with plastic or corrosion-resistant-metal valve for each outlet.
   C. Fittings by Wirsbo, Watts, Uponor, Zurn, and Viega.

15A-28 UNIONS:
   a) Provide unions or flanged joint in each line preceding connections to equipment or valves requiring maintenance.
   b) Provide Stockham brass seat unions of material and pressure rating required by piping system.
   c) Where piping systems of dissimilar materials are jointed together, provide proper insulating union as specified under this Specification.

15A-29 PIPING INSTALLATION:
   a) Piping systems materials and installation shall conform to the following standards and codes:
   b) Pipe sizes indicated on plans and as specified refer to nominal size in inches for steel pipe, cast iron pipe, and copper tubing unless otherwise indicated. In no case shall piping smaller than size specified be used.
   c) Contractor shall provide and be responsible for proper location of pipe sleeves, hangers, supports, and inserts. Install hangers, supports, inserts, etc. as recommended by manufacturer and as specified and detailed on drawings. Verify construction types and provide proper hangers, inserts, and supports in accordance with manufacturer's load ratings and provide for thermal expansion of piping without exceeding allowable stress on piping or supports. Provide solid type hangers and supports where pipe travel exceeds manufacturer's recommendations for fixed hanger and supports. Provide copper plated hangers and supports for suspension of un-insulated copper tubing lines.
d) Install all piping parallel with building lines and parallel with other piping to obtain a neat and orderly appearance of piping systems. All piping shall be concealed unless noted otherwise. Secure piping with approved anchors and provide guides where required to insure proper direction of piping expansion. Piping shall be installed so that allowable stress for piping, valves, and fittings used are not exceeded during normal operation or testing of piping system.

e) Install piping so that systems can be completely drained. Provide piping systems with valved drain connections at all low points and ahead of all sectionalizing valves whether shown on plans or not. Drain lines shall be as follows:

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>DRAIN SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.075” THROUGH 2”</td>
<td>0.75”</td>
</tr>
<tr>
<td>2.5” thru 5”</td>
<td>1”</td>
</tr>
</tbody>
</table>

f) Pitch all piping and where possible make connections from horizontal piping so that air can be properly vented from system. Provide air vents as specified at all system high points and at drops in piping in direction of flow. Use eccentric reducers where necessary to avoid air pockets in horizontal piping.

g) Provide piping materials and wall thickness for specific piping systems as listed in piping schedules in Section 15B. Steel piping systems 2.5 inches and under shall be threaded pipe fittings. Steel pipe systems 3 inches and above shall be welded end pipe and fittings unless required otherwise by Code.

h) Where listed in piping schedules or noted on drawings, provide 2 inches and larger with Victaulic grooved couplings as specified.

i) Provide unions or flanged joints in each pipe line preceding connections to equipment to allow removal for repair or replacement. Provide all screwed end valves with union adjacent to valve unless valve can be otherwise easily removed from line. Provide unions on identical sizes of equipment for which one replacement item to be installed between unions without making any piping changes.

j) Piping fitting materials for specific piping systems shall be as listed in piping schedule. Fittings shall be approved factory made type with threaded or weld ends as required. Fitting pressures and temperature ratings shall be equal to or exceed maximum operating temperature and working pressure of piping system. No mitered or field fabricated pipe fittings will be permitted.

k) All pipe threads shall meet ANSI B2.1 for taper threads. Lubricate pipe threads with Astroseal Teflon thread sealant and lubricating compound applied full strength. Powdered or made up compound will not be permitted. Pipe thread compound shall be applied only to male pipe threads.

l) Welded pipe joints shall be made by qualified welding procedures and welders. Welding electrodes shall be type and material recommended by electrode manufacturer for materials to be welded. All pipe fitting ends shall be beveled a minimum of 30 degrees prior to welding.

m) Brazed socket type joints shall be made with suitable brazing alloys. Minimum socket depth shall be sufficient for intended service. Brazing alloy shall be end fed into socket and shall fill completely annular clearance between socket and pipe or tube. Brazed joints depending solely upon a fillet rather than a socket type joint will not be acceptable.

n) Soft soldered socket type joints shall be made with 95-5 tin-antimony solder as required by temperature and pressure rating of piping systems. Solder socket joints shall be limited to systems containing nonflammable and non-toxic fluids. Soldered socket-type joints shall not be used on piping systems subject to shock or vibration. Soldered joints depending solely upon a fillet rather than a socket-type joint will not be acceptable.
i) Camp Aldrich New Trails Cabin
j) Claflin, KS

o) Make changes in piping size and direction with approved factory made fittings. Steel pipe and fittings suitable for at least 125 psi working pressure or of pressure rating required for maximum working pressure of system, whichever is greater.

p) Where pipe sizes of header or branch water supply piping do not appear on drawings, size piping to plumbing fixtures as follows:

<table>
<thead>
<tr>
<th>FIXTURE TYPE</th>
<th>MAXIMUM QUANTITY OF FIXTURES</th>
<th>PIPE CW</th>
<th>SIZE HW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Closet (Flush Tank)</td>
<td>1</td>
<td>0.5</td>
<td>--</td>
</tr>
<tr>
<td>Water Closet (Flush Tank)</td>
<td>2</td>
<td>0.75</td>
<td>--</td>
</tr>
<tr>
<td>Water Closet (Flush Tank)</td>
<td>5</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Lavatory</td>
<td>1</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Lavatory</td>
<td>3</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>Lavatory</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

15A-30 VALVES AND INSTALLATION:

a) Install necessary valves within piping systems to provide required flow control and to allow isolation for inspection, maintenance, and repair of each piece of equipment or fixture, and on each main and branch service loop. For application of specific valve types see Section 15B of this Specification.

b) Valves 2.5 inches and smaller have solder, socket weld, flanged, or screwed end connections as required by piping materials unless otherwise specified or shown on drawings. Install union connection in the line within 2 feet of each screw end valve unless valve can be otherwise easily removed from line.

c) Each valve shall be installed so that it is easily accessible for operation, visual inspection, and maintenance.

d) Non-rising stem valves shall not be installed at any point in the piping systems. With permission of A/E, non-rising stem valves may be installed at particular points where space is restricted.

e) Valves installed in piping systems shall be compatible with system maximum test pressure, pipe materials, pipe joining method, and fluid or gas conveyed in system.

f) Valves shall be the same size as piping shown on drawings. Do not reduce valve size.

g) Gate valves shall not be installed in pipe lines where intended service is throttling service or where piping is subject to vibration as part of normal operation conditions.

h) Gate and globe valves shall be designed for repacking under pressure when fully opened and back-seated (repacking under pressure is not recommended).

i) Equivalent gate and plug valves listed on current comparison charts of specified valve manufactured by Crane, Centerline, NIBCO, Kennedy, Keystone, Powell, or Victaulic will be acceptable.

j) Equivalent balancing valves by Taco, Flowset, Thrush, or Illinois will be acceptable.

k) Equivalent globe style silent check valves listed on current comparison charts of specified valve manufactured by NIBCO F-910-B or equal by Combination Pump Valve Co., Pagent, or Williams will be acceptable.

15A-31 VALVES:

a) Ball valves shall be scheduled as Type “BLV” valves. Valve specifications by type number shall be as follows:
i) Camp Aldrich New Trails Cabin
j) Claflin, KS

### GENERAL REQUIREMENTS 15Ap 16

#### TYPE NO. SPECIFICATION

<table>
<thead>
<tr>
<th>TYPE NO</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLV-1</td>
<td>2-inch valves and smaller: bronze (ASTM B 584 Alloy 844, ASTM B 62, or ASTM B 61) (no brass containing more than 15 percent zinc) full port ball valve 600 psi-WOB, Teflon seats, stainless steel ball, stem with insulated handle NIBCO T-585-70-66, with screwed ends.</td>
</tr>
</tbody>
</table>

b) Plug valves shall be scheduled as Type “PLV” valves. Valve specifications by type number shall be as follows:

<table>
<thead>
<tr>
<th>TYPE NO.</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLV-1</td>
<td>1-inch valves and smaller: Hays 7400 Series iron body gas cock, 175 psi-WOG bronze plug washer and nut, screwed ends.</td>
</tr>
<tr>
<td>PLV-2</td>
<td>1.25-inch valves through 2.5-inch valves: Homestead Fig. 651, semi-steel lubricated plug valve, 200 psi-WOG, coated plug, short pattern screwed ends. Provide complete with standard pattern cast handle.</td>
</tr>
<tr>
<td>PLV-3</td>
<td>3-inch valves through 10-inch valves: Homestead Fig. 652 semi-steel lubricated plug valve, 200 psi-WOG, coated plug, short pattern, flanged ends. Provide complete with standard pattern cast or pipe handle as required.</td>
</tr>
</tbody>
</table>

c) Silent check valves shall be scheduled as Type “SCV” valves. Valve specifications by type number shall be as follows:

<table>
<thead>
<tr>
<th>TYPE NO.</th>
<th>SPECIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCV-1</td>
<td>2-inch valves and smaller: NIBCO T-480-Y bronze check valve, 250 psi-WOG, stainless steel spring, stainless steel stem, Teflon disc and seat ring, screwed or solder ends.</td>
</tr>
<tr>
<td>SVC-2</td>
<td>2-inch valves and smaller: NIBCO T-433 bronze body, bronze trim check valve, 300 psi-WOG screwed end.</td>
</tr>
</tbody>
</table>

#### 15A-32 PIPE HANGERS AND SUPPORTS:

a) Provide and be responsible for location of piping hangers, supports, and inserts, etc. required for installation of piping under this contract. Design of hangers and supports shall conform to current issue of MSS SP-58.

b) Pipe hangers shall be capable of supporting piping in all conditions of operation. They shall allow free expansion and contraction of piping, and prevent excessive stress resulting from transferred weight being inducted into pipe or connected equipment. Support horizontal or vertical pipes at locations of least vertical movement.

c) Factory made hangers, attachments and supports to be Tolco or Anvil and must be installed per manufacturer’s requirements. All other hangers, attachments and supports must be approved by A/E prior to installation.

d) Hangers, struts, clamps and supports located outdoors shall not be hot dip galvanized after fabrication in accordance with ASTM A123. If located in a corrosive area, hangers, struts and claps shall be type 304 (316) stainless steel with stainless steel hardware.

e) Where horizontal piping movements are such that hanger rod angularity from vertical is greater than 4 degrees from cold to hot position of pipe, offset hanger, pipe, and structural attachments so that rod is vertical in hot position. Hangers shall not become disengaged by movements of support pipe.
f) Provide sufficient hangers to adequately support piping system at specified spacing at changes in piping direction and at concentrated loads. Hangers shall provide for vertical adjustments to maintain pitch required for proper drainage and for longitudinal travel due to expansion and contraction of piping. Fasten hangers to building structural members wherever practicable.

g) Hangers in direct contact with copper pipe or tubing shall be copper plated.

h) Unless indicated otherwise on drawings, support horizontal steel piping as follows:

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>ROD DIAMETER</th>
<th>MAXIMUM SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5&quot; To 0.75&quot;</td>
<td>0.375&quot;</td>
<td>6'</td>
</tr>
<tr>
<td>1&quot; to 1.25&quot;</td>
<td>0.375&quot;</td>
<td>8'</td>
</tr>
<tr>
<td>1.5&quot;</td>
<td>0.375&quot;</td>
<td>9'</td>
</tr>
<tr>
<td>2&quot;</td>
<td>0.375&quot;</td>
<td>10'</td>
</tr>
<tr>
<td>2.5&quot; to 3&quot;</td>
<td>0.5&quot;</td>
<td>12'</td>
</tr>
<tr>
<td>4&quot; to 5&quot;</td>
<td>0.625&quot;</td>
<td>14'</td>
</tr>
</tbody>
</table>

i) Unless indicated otherwise on drawings, support horizontal copper tubing as follows:

<table>
<thead>
<tr>
<th>NOM. TUBING SIZE</th>
<th>ROD DIAMETER</th>
<th>MAXIMUM SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 1&quot;</td>
<td>0.375&quot;</td>
<td>6'</td>
</tr>
<tr>
<td>1.25&quot; And 1.5&quot;</td>
<td>0.375&quot;</td>
<td>6'</td>
</tr>
<tr>
<td>2&quot;</td>
<td>0.375&quot;</td>
<td>9'</td>
</tr>
</tbody>
</table>

j) Support horizontal cast iron soil pipe with one hanger for each joint located close to hub.

k) Support plastic piping as recommended by piping manufacturer.

l) Support vertical cast iron soil pipe and PVC pipe at every floor and steel and copper tubing at every other floor except where indicated otherwise on drawings.

m) Provide continuous thread hanger rods wherever possible. No chain, wire, or perforated straps shall be used. Hanger rods shall be subjected to tensile loading only, where lateral or axial pipe movement occurs provide suitable linkage to permit swing. Provide pipe support channels with galvanized finish for concealed locations and painted finish for exposed locations. Submit design for multiple pipe-supports indicating pipe sizes, service, and support details to A/E for review prior to fabrication.

n) Provide Tolco or Anvi pipe hangers for vertical pipe risers per MSS Type 8 or 42:

   Type 8: Tolco Fig. 6 or Anvil Fig. 261.

   Type 42: Tolco Fig. 14 or Anvil Fig 295.

o) Provide Tolco Fig. 30 steel wall brackets for piping suspended or supported from walls. Brackets shall be carbon steel and selected to meet the load. Finish to be hot dip galvanized in outdoor applications and type 304 (316) stainless steel in corrosive area.

p) Where hangers are placed outside the jackets of pipe insulation, provide galvanized metal shields. Minimum 12" long per MSS-SP-58.

q) Mount hangers for insulated piping on outside of pipe, hangers sized to allow for full thickness of pipe insulation. Shield shall support lower 180 degrees of pipe insulation. Omit copper plating on hangers mounted outside insulation on copper tubing.

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>SHIELD LENGTH</th>
<th>MINIMUM GAUGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>½&quot; to 1-1/2&quot;</td>
<td>12&quot;</td>
<td>18</td>
</tr>
<tr>
<td>2&quot; to 6&quot;</td>
<td>12&quot;</td>
<td>18</td>
</tr>
</tbody>
</table>
i) **Camp Aldrich New Trails Cabin**  
j) **Claflin, KS**

r) Where roller hangers are required and heat loss must be kept to minimum, use Tolco Fig. 260 – Fig. 265 as required by insulation thickness and pipe size.

s) Structural attachments for pipe hangers shall be as follows:

1. For upper attachment for suspending pipe hangers from concrete: Concrete inserts MSS Type 18. Tolco Fig. 309 or Anvil Fig. 282.

2. For attachment to top flange of structural shape: Top beam C-clamps, MSS Type 19. Tolco Fig. 68 or Anvil Fig. 94.

3. For attachment to bottom flange of structural shape: Side beam or channel clamps, MSS Type 27. Tolco Fig. 336 or Anvil Fig. 14.

4. For attachment to center of bottom flange of beams: Center beam clamps, MSS Type 21. Tolco Fig. 62 or Anvil Fig. 133.

5. For attachment to bottom of beams where heavy loads are encountered and hanger rod sizes are large: Welded attachment, MSS Type 22. Fig. 305 or Anvil Fig. 66.

6. For attachments to structural shapes: C-clamps, MSS Type 23. Tolco Fig. 64 or Anvil Fig. 95.

7. For attachment to top of beams when hanger rod is required tangent to edge of flange: Top I-beams clamps, MSS Type 25. Tolco Fig. 335 or Anvil Fig. 217.

8. For attachment to bottom of steel I-beams for heavy loads: Steel I-beam/WF-beam clamps with eye nut for pipe size 12" and smaller MSS Type 28. Tolco Fig. 62 or Anvil Fig. 133. For pipe size 14" and larger MSS Type 29 Tolco Fig. 297SP or Anvil Fig. 292L.

9. Provide Tolco Fig. 506 vibration control hangers at locations on piping to prevent vibrations from being transmitted to building structure by conventional hangers. Apply hangers within their load supporting range and per the following:

   A. All pipe supports on lines that are connected directly to rotating equipment that have no flexible connection between equipment and piping.

   B. All pipe supports within the first 50 lineal feet after a flexible connection to rotating equipment. All supports between the flexible connection and the rotating equipment.

   C. All pipe supports that are attached to piping that is not connected to rotating equipment is exempt from vibration isolation.

t) Provide Anvil International, Inc. Fig. 45 channel trapeze pipe hangers for horizontal multiple pipe runs with Anvil Strut pipe clamps or pipe rollers as follows:

<table>
<thead>
<tr>
<th>PIPE MATERIAL</th>
<th>PIPE SIZE</th>
<th>CLAMP NO.</th>
<th>ROLLER NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>0.375&quot; through 4&quot;</td>
<td>AS1100</td>
<td>AS1901</td>
</tr>
<tr>
<td>Steel</td>
<td>0.375&quot; through 6&quot;</td>
<td>AS1100</td>
<td>AS1902</td>
</tr>
</tbody>
</table>

u) Pipe supports for horizontal piping mounted on pipe racks or stanchions shall be Anvil International, Inc. Fig. 259 or equivalent by Advanced Thermal Systems. Where racks and supports are not detailed on drawings, submit detailed support drawings to A/E for review prior to fabrication.

v) Provide TOLCO fig 318A and 316T combination pipe saddle with adjuster to support piping from floor. Provide complete with pedestal type floor stand.
w) Provide Tolco Fig. 20 or Anvil Fig. 262 short strap for attaching pipe tight to ceilings as noted on plans.

x) Provide necessary structural steel and attachment accessories for installation of pipe hangers and supports. Where heavy piping loads are to be attached to building structure, verify structural loading with A/E prior to installation.

y) Equivalent hangers and supports by Tolco, Anvil, PHD, Anvil International, Inc., or Fluorcarbon Company.

15A-33 EQUIPMENT ANCHORS:

a) Provide floor or foundation mounted equipment such as air handling units, etc. with Decature Engineering Company concrete anchors.

b) Where equipment anchors cannot be installed during forming of floors or foundations, anchor equipment with McCullock Kwik-Bolt concrete anchors.

c) Anchors shall be proper type and size recommended by manufacturer for equipment to be anchored.

d) Equals by ITW, Masterset, MKT Fastening, and Power Fastening.

15A-34 CONCRETE INSERTS AND ANCHORS:

a) Provide concrete inserts for attaching piping and equipment as follows:

1. In new construction where attachment points can be predetermined, provide PHD Fig. 950 continuous concrete insert of Fig. 950N Universal Steel Concrete insert.

2. In existing construction or new construction where attachment points cannot be located before setting concrete forms, provide McCullock Kwik-Bolt or Phillips red head concrete anchors of proper type for attachments.

b) Equals by ITW, Masterset, MKT Fastening, and Power Fastening.

15A-35 TESTING PROCEDURES:

a) Test all lines and systems before they are insulated, painted, or concealed by construction or backfilling. Provide fuel, water, electricity, materials, labor, and equipment required for tests.

b) Where entire system cannot be tested before concealment, test system in sections. Upon completion, each system shall be tested as entire system.

c) Repair or replace defects, leaks, and materials failures revealed by tests and then retested until satisfactory. Make repairs with new materials.

d) Verify that system components are rated for maximum test pressures to be applied. Where specified test pressures exceed component ratings, remove or isolate components from system during tests.

e) Test methods are pressures shall be as follows:

1. Hydrostatic Test (Closed System):

   A. Hydrostatic test shall be performed using clean unused domestic water. Test pressures shall be as scheduled for systems or 150 percent of operating pressure where not specified.

2. Hydrostatic Test (Open System):
i) Camp Aldrich New Trails Cabin
j) Claflin, KS

A. Test entire system with 10 feet of head water. Where system is tested in sections, each joint in building except uppermost 10 feet of system shall be submitted to at least 10 feet head of head water. Water shall be held in system for 15 minutes before inspection starts. System shall hold test pressure without leaks.

3. Pneumatic Test:

A. Test entire system with compressed air. Systems operating above 2 psi shall be tested at 75 psi or 150 percent of operating pressure, whichever is greater.

B. Allow at least 1 hour after test pressure has been applied before making initial test.

C. During test, completely isolate entire system from compressor or other sources of air pressure.

4. Pressure Relief and Safety Valve:

A. Before installation test pressure temperature and safety relief valves to confirm relief settings comply with Specifications.

B. Tag items that pass test with date of test, observed relief pressure setting, and inspector's signature.

C. Items installed in systems without test tag attached will be rejected.

f) All systems shall hold scheduled test pressures for specified time without loss of initial test pressure.

g) Upon completion of testing submit five (5) copies of typewritten report to A/E. Report shall list systems tested, test methods, test pressures, holding time, and all failures with corrective action taken.

h) For test pressures see piping material schedule.

15A-36 PIPING PROTECTIVE COATING:

a) Provide pipe lines listed in pipe schedule to be coated with Pipe Line Service Company X-Tru-Coat high density polyethylene or polypropylene coating extruded on pipe over a thermal plastic adhesive.

b) Coating shall be minimum of 25 mils thick over minimum 10 mil thickness of thermal plastic adhesive.

c) Prepare and coat field made pipe joints and make coating repairs according to manufacturer's recommendation. Cover joints with shrinkable polyethylene sleeve. Coated piping passing through pipe sleeve shall have double thickness coating through sleeve.

15A-37 PIPING AND EQUIPMENT INSULATION:

a) Provide necessary materials and accessories for installation of insulation for plumbing and mechanical systems as specified and/or detailed on drawings. Insulation type, jacket, and thickness for specific piping systems or equipment shall be as listed in insulation schedule.

b) Provide insulation materials manufactured by Certain Teed, Knauf, Dow Chemical Company, Johns Manville, or Owen/Corning Fiberglass.

c) Insulation, except where specified otherwise, shall have composite fire and smoke hazard ratings as tested by ASTM E 84, NFPA 255, and UL 723 procedures not exceeding:

FLAME SPREAD 25
d) Provided insulation accessories such as adhesives, mastics, cements, tape, and glass fabric with same component ratings as listed above. Products or their shipping cartons shall bear label indicating their flame and smoke ratings. Treatments of jackets or facings for impart flame and smoke safety shall be permanent. Use of water soluble treatments such as corn paste or wheat paste is prohibited. This does not exclude approved lagging adhesives.

e) Install insulation over clean dry surfaces with joints firmly butted together. Insulation at equipment, flanges, fittings, etc. shall have straight edges with box type joints with corner beads as required. Where plumbing and heating insulation terminates at equipment or unions, taper insulation at 30 degree angle to pipe with one coat finishing cement and finish same as fittings. Total insulation system shall have neat smooth appearance with no wrinkles, or folds in jackets, joint strips, or fitting covers. Seal butt joints at maximum intervals of 45 feet to prevent vapor barrier failures from being transmitted to adjoining insulations sections.

f) Undamaged insulation systems on cold surface piping and equipment shall perform their intended functions as vapor barriers and thermal insulation without premature deterioration or vapor barrier. Contractor shall take every reasonable precaution to provide insulation systems with continuous unbroken vapor barriers.

g) Where glass is specified in the following insulation methods, provide resin impregnated with open weave glass fabric with 10/20 thread count.

h) Abbreviations for manufacturers of adhesives, mastics, and coating specified shall be C.M. for Chicago Mastic Company and B.F. for Benjamin Foster Company.

i) Provide piping systems scheduled for metal insulation jacket with insulation system type specified except omit factory applied jackets on plastic foam or calcium silicate insulation unless indicated otherwise in schedule. Secure insulation with 1.5-inch-wide pressure sensitive type bands on plastic foam insulation and with galvanized tie wire on calcium silicate insulation system with stucco embossed aluminum vapor barrier metal jacket and matching aluminum fitting covers by Childers Products Co., Harren Metals Inc., or Premetco International. Lay fitting covers 2 inches over adjacent insulation jacket and apply 4-inch butt joint strips secured with stainless steel bands Jacket thickness shall be as scheduled with interior surfaces of metal fitting covers factory or field coated with not less than 10 mil thickness of C.M. No. 16-110 or B.F. No. 30-36 mastic coating. Jacket length shall be 3 or 4 feet applied with longitudinal and circumferential joints sealed with 0.125-inch bead of butyl or elastomeric sealant and lapped 2 inches over adjacent cover. Secure cover on piping 12 inches OD and smaller on 2-inch OD and above piping. Bands shall have thumb seals and be coated on 6-inch centers on piping 6-inches OD and smaller and on 12-inch centers on piping 8 inches and larger. Attach bands on aluminum jackets that cover insulation without vapor barrier jacket with one pop rivet, secure bands on aluminum jackets that cover insulation with vapor barrier jackets by cutting diagonal cut in longitudinal lap adjacent on piping within 6 feet of floor shall be 0.020-inch-thick or double jacket of 0.016-inch thickness.

j) Piping insulation materials and application methods by type shall be as follows:

1. TYPE 2-PC: Insulation for cold surface piping system with minus 50 deg F to plus 220 deg F operating temperature range shall be Armstrong AP Armaflex Elastomeric pipe insulation average thermal conductivity shall not exceed 0.27 BTU/Hr. at 75 deg F mean temperature. To greatest extent possible apply insulation without longitudinal joint by slipping insulation over piping. Seal all seams and butt joints with Armstrong 520 adhesive. Thickness shall be per manufacturer's recommendations using a maximum severity of 90 deg F and 80 percent RA. Insulate fittings as follows:

   A. Insulate exposed and concealed valves fittings with miter-cut pieces of AP/Armaflex pipe insulation equal to thickness of adjoining pipe insulation. Insulate fittings too large to cover
with pipe insulation with insulation from fabricated/Armaflex sheet insulation using Armstrong templates. Join and seal all fittings joints with Armstrong 520 adhesive. Finish insulation as soon as possible with two coats of Armstrong Armaflex vinyl-lacquer finish in color selected by Architect. All insulation used outdoors shall be painted to prevent ultra violet deterioration of insulation.

k) Insulation materials and application methods for piping hangers supports, anchors, guides, expansion joints, etc. shall be as follows:

1. Insulate hangers and supports from direct contact with cold surfaces with ITW Trymer Supercel Phenolic inserts or equal of half or full sections of pre-molded pipe insulation equal in thickness to adjoining insulation. Provide inserts with vapor barrier jacket for lapping 2 inches over adjacent pipe insulation jacket. Protect insulation with insulation shields supporting lower 180 degree of pipe insulation sized so that pipe compressive load does not exceed one-third of insulation insert compressive strength. Seal joints with vapor barrier sealer specified for insulation type used. Materials shall meet the ASTM E84 burn characteristics of 25/50.

2. Insulate pipe anchors in direct contact with cold piping for a distance of 12 inches or as detailed on drawings form contact point with piping. Anchor insulation shall be one-half the thickness of adjoining pipe insulation with vapor barrier. Seal and finish joints with vapor barrier sealer specified for insulation type used.

3. Insulate pipe guides from direct contact with cold surfaces piping with Styrofoam HD-300 plastic foam full section inserts of pre-molded pipe insulation equal in thickness to adjoining pipe insulation. Provide inserts with vapor barrier jacket for overlapping 2 inches over adjoining pipe insulation. Insert jacket shall be equal in performance and appearance to adjacent insulation jacket. Seal and finish joints with vapor barrier sealer specified for insulation type used.

4. Insulate pipe expansion joints on cold surface piping with over-sized section of pre-molded pipe insulation equal in thickness to adjoining pipe insulation. Cover shall float free one end with expansion and contraction of piping system. Seal free end with 4 mil thick PVC vinyl sheet attached to adjoining insulation. Provide sufficient slack in vinyl material to allow for maximum pipe movement.

5. Where piping hanger cannot be isolated from cold pipe surfaces, insulate piping at hanger locations with extra thickness of pipe insulation. Insulate hanger rod to a point 12 inches above pipe with minimum insulation thickness equal to one-half thickness of pipe insulation. Seal and finish joints with vapor barrier sealer specified for insulation type used.

6. Insulate floor supports in direct contact with cold surface piping with Armstrong 0.5-inch-thick Armstrong FR/Armaflex pipe or sheet insulation as required by surface. Insulate supports from pipe to floor plate and seal insulation joints with Armstrong No. 520. Finish insulation with Armstrong Armaflex vinyl-lacquer finish.

7. All pipe insulation shall be continuous through walls, ceiling, or floor openings or sleeves except where firestop or firesafing materials are required.

l) Insulation of removable heads and valves, manhole access covers, HVAC and plumbing pumps, etc. shall be fabricated to allow removal without damage to insulation. Provide removable units with vapor-proof cover fabricated to be sealed to equipment vapor barrier.

m) Insulation failing to meet workmanship and appearance standards shall be replaced with an acceptable installation before final acceptance of project will be given. Insulation failing to meet performance requirements of this Specification for a period of one (1) year after date of final acceptance or through one (1) heating season and one (1) cooling season, whichever is longer, shall be replaced with an acceptable installation. All costs to correct insulation deficiencies and costs to repair damages to other work shall be at M/C’s expense at no cost to Owner.
i) Camp Aldrich New Trails Cabin  

j) Claflin, KS

**15A-38 DUCTWORK INSULATION:**

a) Provide necessary materials and accessories for installation of interior and exterior ductwork insulation as specified and/or details on drawings. Insulation type and thickness for specific ductwork systems shall be as listed in insulation schedule in Section 15B of this Specification.

b) Provide insulation materials manufactured by Owens-Corning, John Manville, CertainTeed, or Knauf.

c) Insulation and application adhesives, except where specified otherwise, shall have fire and smoke hazard rating as tested by ASTM E 84 procedure not exceeding:

<table>
<thead>
<tr>
<th>Flame Spread</th>
<th>Smoke Developed</th>
<th>Fuel Contributed</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

d) Abbreviations for manufacturers of adhesives, insulating cements, and coating specified shall be C.M. for Chicago Mastic Company, B.F. for Benjamin Foster Company and 3M for 3M Company. Average thermal conductivity expressed in BTU/hr./sq.ft./deg F/lin.

e) Install interior duct liner insulation cut to insure tight fitting corner and longitudinal joints. Apply liner to sheet metal with 100 percent coverage of C.M. No. 17-477, B.F. No. 81-18, or 3M manufacturer’s recommended application rate. Coat all edges of liner with adhesive. Provide mechanical fasteners on surfaces 18 inches or wider in addition to liner adhesive with fastener clips set flush with duct liner surface. Provide fasteners as follows:

1. Low Velocity Ductwork (Velocities less than 2000 FPM): Provide fasteners within 3 inches of leading edge of each section 12 inches OC around joint perimeter and 3 inches from longitudinal joints 12 inches OC. Elsewhere space fasteners 18 inches OC except not more than 6 inches from longitudinal joints nor 12 inches from corner break.

f) Provide concealed rectangular or round ductwork with exterior thermal insulation of type and thickness listed in schedule. Apply insulation to duct with C.M. No 17-477 or B.F. No. 85-20 adhesive. Provide mechanical fasteners 18 inches OC on duct width 30 inches and greater. Butt insulation joints tightly together and lap facing 2 inches over adjacent insulation and seal with vapor barrier adhesive. Seal all breaks with vapor barrier adhesive and vapor barrier tape matching insulation facing.

g) Provide exposed rectangular ductwork with exterior thermal insulation of type and thickness listed in insulation schedule. Apply with mechanical fasteners spaced 12 inches OC with minimum of two (2) rows per duct side. Seal fasteners, joint breaks, and punctures with vapor barrier adhesive reinforced with 3-inch-wide vapor barrier tape matching insulation facing.

h) Provide exposed round sheet metal ductwork with exterior thermal insulation of type and thickness listed in insulation schedule. Apply insulation with joints tightly butted together with vapor barrier adhesive. Insulate fittings with insulation thickness to equal adjoining insulation with cover overlapping 2 inches onto adjacent covering.

i) Duct insulation materials by type shall be as follows:

1. **TYPE 1-DIL:** Internal acoustical and thermal duct insulation for low velocity ductwork shall be CertainTeed 2-pound density Toughgard 2 duct liner with 0.24 BTUH thermal conductivity at 75 deg F mean temperature. Facing shall have a maximum water vapor sorption rate of 4 percent by weight.

2. **TYPE 2-DIL:** Internal acoustical and thermal duct insulation for low velocity ductwork shall be Armacell SA Black, 3-pound density closed-cell duct liner with 0.25 BTUH thermal conductivity at 75 deg F mean temperature. Facing shall have a maximum vapor sorption rate of 4 percent by weight. AP Armaflex SA Black Duct Loner/Wrap shall meet the requirements of NFPA 90A and
i) Camp Aldrich New Trails Cabin
j) Claflin, KS

90B for Duct Coverings and Linings, and UL 181 for Mold Growth. Approved for use in return air plenums, conforms to ASTM C 1534 requirements and withstands temperatures of 250 deg F.

3. TYPE 4-DEW: External thermal insulation for rectangular or round duct shall be CertainTeed, type 100, 1.0-pound per cubic foot density standard duct insulation complying with ASTM C 1290 and ASTM C 553 and 0.26 BTUH thermal conductivity at 75 deg F mean temperature. Provide foilskrim-kraft facing, FSK, meeting the requirements of ASTM C1136 with a maximum vapor transmission rate of 0.02 perms.

15A-39 ELECTRICAL REQUIREMENTS:

a) Consult Section 16B of electrical Specifications for work to be provided by E/C in conjunction with installation of mechanical equipment.

b) Electrical work required to install and control mechanical equipment which is not shown on plans or specified under Section 16B shall be included in M/C’s base bid proposal.

c) The cost of larger wiring, conduit, control, and protective devices resulting from installation of equipment which was not used for basis of design as outlined in Section 15-A-10g of Specifications shall be paid by M/C at no cost to owner or A/E.

d) M/C shall be responsible for providing supervision to E/C to insure that required connections, interlocking, and interconnection of mechanical and electrical equipment are made to attain intended control sequences and system operation.

e) Furnish complete sets of electrical wiring diagrams to A/E and to E/C. Diagrams shall show factory and field wiring of components and controls. Control devices and field wiring to be provided by E/C shall be clearly indicated by notation and drawing symbols on wiring diagrams.

f) M/C shall obtain complete electrical data on mechanical shop drawings and shall list this data on approval form which shall be presented monthly, or on request, to E/C. Data shall be complete with wiring diagrams received to date and shall contain necessary data on electrical components of mechanical equipment such as HP, voltage, amperes, watts, and locked current to allow E/C to order electrical equipment required in his contract.

g) Safety disconnect switches and manual and magnetic motor starters shall be provided by E/C. Exceptions will be allowed where mechanical equipment is specified with these devices installed as part of factory-built control systems.

15A-40 RECORD DOCUMENTS:

a) Record Drawings: Maintain a reproducible set of contract drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing “field” condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on working drawings. Mark with red erasable red pencil and, where feasible, use other colors to distinguish between variations in separate categories of work. Mark-up new information which is recognized to be of importance to Owner, but was for some reason not shown on either contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable. Organize record drawing sheers into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on cover of each sheet.

b) Record Specifications: Maintain one (1) copy of Specifications, including addenda, change orders, and similar modifications issued in print form during construction and mark-up variations (of substance) in actual work in comparison with text of Specifications and modifications, as issued. Give particular attention to substitutions, selection option, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related
record drawing information and product data, where applicable. Upon completion of mark-up, submit to A/E for Owner’s records.

c) The Contractor shall provide a full set of photographs showing the entire underground equipment. The photographs shall be taken prior to any concrete being poured. The underground equipment shall consist of, but not be limited to, the following:

1. Piping.
2. Conduits.
3. Ductwork.

d) The Contractor shall provide the photographs in an 8.5-inch by 11-inch format for record keeping purposes with the maintenance manuals. The photos shall all be digital and a disk or CD shall be provided to the Owner as a permanent record.

e) As-built documents shall be submitted for approval prior to final payment. Copies of “in-progress” as-built drawings shall be submitted at each pay request.

END OF SECTION 15A
15B-1 PIPING SYSTEMS MATERIALS:

a) Refer to Section 15A of this specification for piping material specifications and installation instructions.

b) See schedule for specific piping materials and joining methods for systems installed under this section.

<table>
<thead>
<tr>
<th>Service</th>
<th>Letter Wording</th>
<th>Marker Color</th>
<th>Letter Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Cold Water</td>
<td>Domestic Cold Water</td>
<td>Green</td>
<td>White</td>
</tr>
<tr>
<td>Domestic Hot Water</td>
<td>Domestic Hot Water</td>
<td>Yellow</td>
<td>Black</td>
</tr>
<tr>
<td>Propane</td>
<td>Propane</td>
<td>Yellow</td>
<td>Black</td>
</tr>
<tr>
<td>Make-up Water</td>
<td>Make-up Water</td>
<td>Green</td>
<td>White</td>
</tr>
<tr>
<td>A/C Condensate Drain</td>
<td>Drain</td>
<td>Green</td>
<td>White</td>
</tr>
<tr>
<td>Fire Sprinkler Water</td>
<td>Fire Sprinkler Water</td>
<td>Red</td>
<td>White</td>
</tr>
</tbody>
</table>

15B-2 PIPING SYSTEMS VALVES:

a) Refer to Section 15A of this specification for valve type specifications and installation instructions.

b) See schedule for valve types to be installed under this section.

<table>
<thead>
<tr>
<th>Service</th>
<th>Size</th>
<th>Stop</th>
<th>Check</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Water</td>
<td>Up to 2.5&quot;</td>
<td>BLV-1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Domestic Water</td>
<td>Up to 2&quot;</td>
<td>--</td>
<td>SCV-1</td>
<td>--</td>
</tr>
<tr>
<td>Natural Gas/Propane</td>
<td>Up to 1&quot;</td>
<td>PLV-1</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Natural Gas/Propane</td>
<td>1.25&quot; to 2.5&quot;</td>
<td>PLV-2</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

15B-3 PIPING SYSTEM INSULATION:

a) Refer to Section 15A for insulation type specifications and installation instructions.

b) See schedule for insulation types and thickness for piping installed under this section.

<table>
<thead>
<tr>
<th>Service</th>
<th>Size</th>
<th>Type</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Cold Water</td>
<td>All</td>
<td>2-PC</td>
<td>0.5&quot;</td>
</tr>
<tr>
<td>Domestic Hot Water</td>
<td>All</td>
<td>2-PC</td>
<td>1&quot;</td>
</tr>
</tbody>
</table>

15B-4 DUCTWORK INSULATION:

a) Refer to Section 15A for ductwork insulation specifications and installation instructions.

b) See schedule for insulation for ductwork to be insulated under this section.

c) **Ductwork scheduled for internal lining is NOT sized on the drawings to include the lining. Size shown on the drawing is the inside duct measurement.**
### Ductwork Insulation Schedule

<table>
<thead>
<tr>
<th>System</th>
<th>Type</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Air – Rectangular</td>
<td>1-DIL</td>
<td>0.5”</td>
</tr>
<tr>
<td>Supply Air – Round</td>
<td>4-DEW</td>
<td>1.5”</td>
</tr>
<tr>
<td>Return Air – Rectangular</td>
<td>1-DIL</td>
<td>0.5”</td>
</tr>
<tr>
<td>Return Air – Round</td>
<td>4-DEW</td>
<td>1.5”</td>
</tr>
<tr>
<td>Exhaust Air – Rectangular</td>
<td>1-DIL</td>
<td>0.5”</td>
</tr>
<tr>
<td>Exhaust Air – Round</td>
<td>4-DEW</td>
<td>1.5”</td>
</tr>
</tbody>
</table>

### 15B-5 Schedule of Fixture Branches:

a) Connection to individual plumbing fixtures shall be as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Waste</th>
<th>Vent</th>
<th>Cold</th>
<th>Hot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinal</td>
<td>2”</td>
<td>1.5”</td>
<td>1”</td>
<td>--</td>
</tr>
<tr>
<td>Water Closet – Flush Tank</td>
<td>4”</td>
<td>2”</td>
<td>0.5”</td>
<td>--</td>
</tr>
<tr>
<td>Lavatory</td>
<td>2”</td>
<td>1.25”</td>
<td>0.5”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Drinking Fountain</td>
<td>2”</td>
<td>1.25”</td>
<td>0.5”</td>
<td>--</td>
</tr>
<tr>
<td>Janitor Basin</td>
<td>3”</td>
<td>1.5”</td>
<td>0.5”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Shower</td>
<td>2”</td>
<td>1.5”</td>
<td>0.5”</td>
<td>0.5”</td>
</tr>
<tr>
<td>Sink</td>
<td>2”</td>
<td>1.5”</td>
<td>0.5”</td>
<td>0.5”</td>
</tr>
</tbody>
</table>

### 15B-6 Adjustment and Balancing:

a) Adjust flush valves to minimum volume and balance flow in hot water returns as required to maintain proper water temperature in all branches circulated.

### 15B-7 Drains, Floor Sinks, Downspout Nozzles, etc.:

a) Floor Drains: Block out floor prior to pouring of concrete and then level floor drain after pour is set, remove forms, and grout level:

1. Refer to Schedule on drawings for specific requirements.
2. All floor drains in finished areas shall have nickel-bronze strainers except at showers where they shall be chrome-plated strainers.
3. Provide each drain that does not have an integral “P” trap with a cast iron “P” trap in connecting piping.
4. See Architectural plans for floor drain top elevations and floor drainage.
5. Floor drains shall be as manufactured by Wade, Josam, Watts, or Zurn.
6. Sioux Chief shall be allowed on PVC piping systems only.

b) Floor troughs/Trench Drain: As specified on Drawings.
c) Floor Drain Trap Seal:

1. Trap seal inserts shall be provided in each floor drain and floor sink. Provide sizes as recommended by seal manufacturer.
2. Trap seal device shall comply with ASSE 1072-07.
Camp Aldrich New Trails Cabin
Claflin, KS

3. Sure Seal, Proset Trap Guard and J.R. Smith Quad Seal shall be considered allowable manufacturers.

15B-8 CLEANOUTS:

a) Provide cleanouts full size of soil pipe up to and including 4-inch ID. Provide cleanouts at base of stacks, end of sewer main, and at elbows over 45 degrees and in any horizontal run of piping exceeding 100 feet at 50-foot intervals. Block out floor prior to pouring of concrete and then level cleanout after pour is set, remove forms, and grout level. Install cleanouts so they are accessible by extending them through walls, floors, and above or to outside of building, as required. Cleanouts shall be as follows:

1. Wall Type Finished Areas: J.R. Smith No. 4532 cast iron cleanout “T” with cleanout plug and stainless steel access cover.
2. Wall Type Unfinished Areas: J.R. Smith No. 4512 cast iron cleanout “T” with countersunk plug.
3. Floor Type Hard Flooring Areas: J.R. Smith 4023 with round chrome plated scoriated cover.
4. Floor Type Carpet Areas: J.R. Smith 4023-X with nickel bronze top and carpet clamp.
5. Floor Type Carpet Areas: J.R. Smith 4023-Y with nickel bronze top and carpet marker.
6. Finish Grade Cleanout: J.R. Smith 4223 cast iron with extra duty cast iron top.

b) Equivalent cleanouts by Wade, Watts, Zurn, Josam or Jonespec will be acceptable.

c) Verify floor materials used from Architectural plans.

15B-9 HYDRANTS:

a) Wall Hydrants: All Wall Hydrants shall be freeze-proof.

15B-10 SHOCK ABSORBERS:

a) Provide Josam Absorbotron shock absorbers, or approved equal, on all plumbing fixture batteries where shown on plans sized in accordance with the Plumbing and Drainage Institute Standards PDI WH201. Equivalent shock absorbers by Zurn, Wade, Sioux Chief, or J.R. Smith will be acceptable.

15B-11 PLUMBING FIXTURES:

a) Provide plumbing fixtures as shown on drawings as specified complete including piping and connections. China fixtures shall be of best grade vitreous ware, without pit holes or blemishes, and outlines shall be generally true. Architect reserves right to reject any piece which, in his opinion, is faulty. Fixtures fitting against walls shall have ground backs. Exposed piping and fitting shall be chrome plated.

b) Set fixtures true and level with all necessary supports for fixtures installed before plastering is done. Nipples through wall to fixture connection shall be chrome plated brass. Contractor may use copper stub outs to stops under lavatories, provided deep escutcheons are used and no copper is visible in lieu of chrome nipples.

c) Equivalent fixtures and accessories by the following manufacturers will be acceptable:

1. Fixtures: American Standard, Eljer, Kohler, Toto, Crane, or Zurn.
2. Toilet Seats: Church, Olsonite, Toto, Bemis, American Standard, Kohler or Beneke.
3. Fittings and Supports: Josam, J.R. Smith, Zurn, or Wade.

4. Faucets & Shower Valves: Moen or as specified.

5. Flush Valves: Sloan, Zurn, Delany, or Toto.

6. Traps, Supplies, and Stops: Dearborn, Sanitary Dash, or as specified under plumbing fixtures:
   A. Lavatory Supplies and Stops: McGuire LF170, 0.5-inch compression inlet with angle compression stop and 0.375-inch OD risers in length required. Provide deep chrome plated brass escutcheons.
   B. Water Closet Supplies and Stops: McGuire LF187, 0.5-inch compression inlet with angle compression stop and 0.5-inch OD risers in length required. Provide deep chrome plated brass escutcheons.
   C. Traps: McGuire 8912C (1.5-inch) and/or 8872C (1.25-inch) cast brass body with cleanout “P” trap. Provide deep chrome plated brass escutcheon with set screw. Provide offset tailpieces as required for ADA compliance.

7. See Schedule for fixture type to be installed under this section.

15B-12 WATER HEATER:
   a) Provide water heaters as specified below and as indicated on construction drawings.
   b) Water heaters shall meet ASHRAE 90A-1 980 and shall be ASME rated.
   c) Gas water heaters shall be CSA certified.
   d) Equivalent by National, Lochinvar, Bradford White, Ruud, Rheem, A.O. Smith, or State will be acceptable.

15B-13 BACKFLOW PREVENTERS:
   a) Provide where indicated on plans Watts Model 709 double-check backflow preventer with strainer and ball valves (2.5 inches and smaller) or butterfly valves (over 2.5 inches). Equal by Febco, Hershey, Ames, or Wilkins will be acceptable.
   b) Provide where indicated on plans Watts Model 909 reduced-pressure, backflow preventer with strainer, drip cup, and ball valves (2.5 inches and smaller) or butterfly valves (over 2.5 inches). Equal by Febco, Hershey, Ames, or Wilkins will be acceptable.

15B-14 OPENINGS:
   a) This Contractor shall include the installation of all boxes and sleeves for openings required to install this work, excepting only structural openings incorporated in the structural drawings. Sleeves shall be installed for all pipes passing through structural slabs and walls. He shall set and verify the location of sleeves as shown on structural plans that pass through beams, only if so shown.
   b) Penetrations in walls for sheet metal ducts shall be sealed by the M/C by stuffing glass fiber into the cracks between the walls and floors, and the ducts. The exposed joints shall then be caulked on each side with non-hardening caulking such as “Tremco Acoustical Sealant.” This work applies to all walls in buildings.
15B-15 ACCESS PANELS:

a) Access panels shall be provided wherever necessary to provide access to valves, traps, etc., located in concealed spaces. Each fire damper, automatic splitter damper, etc., shall have an access panel. Size shall be adequate for inspection and removal of equipment and none shall be less than 12-inch by 6-inch.

b) Duct Access Doors: Doors shall be equivalent to CESCO Model HDD. Frame shall not be less than 22-gauge galvanized steel, with 24-gauge door panels. Doors shall have minimum 1-inch-thick insulation, PVC foam tape gaskets; zinc plated steel continuous type hinge and latches. Equivalent by American Warming and Ventilating, Cesco, Flexmaster, Greenheck, McGill Airflow, Milcor, Pottoroff, Ward and Nailor will be acceptable.

c) Wall and Ceiling Access Doors: Doors shall be equivalent to Milcor DW, concealed frame, access panels. Frame shall be 16-gauge steel with a 14-gauge door panel prime coated with electrostatic powder. Lock shall be a screwdriver operated unless a keyed lock is noted on plans. Equals by Acudor, Babcock-Davis, Cesco, Elmdor, Karp, MiFab and Nystrom.

d) Fire Rated Wall/Ceiling Access Door: Doors shall be equivalent to Milcor UFR. Frame shall be 16-gauge galvanized bonderized steel and 20-gauge galvanized bonderized steel. Hinges shall be continuous, galvanized steel with stainless steel pin and a key operated latch. Provide automatic type door closure. Door shall have a UL rating to match rating of wall/ceiling rating. Equals by Acudor, Babcock-Davis, Cesco, Elmdor, Karp, MiFab and Nystrom.

15B-16 SHEET METAL WORK:

a) Provide commercial quality prime, bright spangled galvanized sheet steel on all ductwork. Sheet metal shall be manufactured in the United States of America.

b) Construct ductwork as detailed on drawings and as detailed in the latest edition of the Sheet Metal and Air Conditioning Contractor’s Association (SMACNA) Duct Manual. Details shown on project plans shall indicate specific construction methods to be used on this project, and shall be used in lieu of any alternate methods shown in SMACNA Duct Manual.

c) Construct and install ductwork to be completely free from vibration under all conditions of operation. Support and securely anchor ductwork and equipment from structural framing of building. Provide suitable intermediate metal framing where required between building structural framing.

d) Each duct system shall be constructed for the specific duct pressure classifications shown on the contract documents or in equipment fan schedule listed as external total static pressure.

e) All metal ductwork scheduled for interior thermal and acoustical liner is not sized on plans to include the proper thickness of insulation. Add 1 inch or 2 inches in height and width of ductwork to accommodate insulation thickness. Mount duct specialties such as turning vanes, damper, etc., to ductwork with the section insulated “Build Outs” to maintain continuity of thermal barrier.


g) Where dimensions, sizes, and arrangements of elements of duct assembly and support systems are not provided herein, the Contractor shall select such to be suitable for the service. All methods and devices shall be subject to the review and approval from Engineer.

h) Make ductwork transitions with sides sloped not to exceed a maximum of 20 degrees, 40 degrees included angle for diverging air flow and 30 degrees, 60 degrees included angle for converging air flow. Factory fabricated reduced fittings of ASME short flow nozzle design will be acceptable for round ductwork.
i) Provide turning vanes in all elbows over 20 degrees unless otherwise noted.

j) The Contractor shall follow the applications recommendations of the manufacturer of all hardware and accessory items and make selections of such consistent with the duct classification and services.

k) Elbows for round ductwork shall be die formed though 8-inch diameter and 5 sections elbow 9 inches and above in diameter.

l) Ducts shall be sealed in accordance with Table1-2 of SMACNA Manual 1 5d. The allowable air leakage shall be in compliance with SMACNA standards for each respective duct pressure class and duct seal class. Duct sealing shall meet the following:

1. Seal level "A" requirements shall include all transverse joints, longitudinal seams, and duct wall penetrations. Pressure-sensitive tape shall not be used.

2. Seal level “B” requirements shall include all transverse joints and longitudinal seams. Pressure-sensitive tape shall not be used.

3. Seal level “C” requirements shall include transverse joints only.

4. Spiral lock seams in round or flat oval ducts need not be sealed.

5. Minimum duct sealant levels shall be as follows:

<table>
<thead>
<tr>
<th>DUCT SEALANT LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duct Location</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Outdoors</td>
</tr>
<tr>
<td>Unconditioned Spaces</td>
</tr>
<tr>
<td>Conditioned Spaces</td>
</tr>
</tbody>
</table>

m) All exposed round ductwork and fittings in Main Level Dining Hall or Basement Classroom shall be double-wall, galvanized steel, spiral lock seam, with 1-inch fiberglass insulation. Provide perforated inner liner instead of solid inner liner when noted on plans. Outer shell shall be “paint-grip” sheet metal. Provide double-wall round ductwork and fittings as manufactured by United McGill or approved equal.

n) At Contractor’s option, ductwork may be joined with prefabricated galvanized “Ductmate” sections. The joint packing material and joint construction details using this method shall be submitted to the Engineer for review.

o) All duct pressure classes shall be same as the external static pressure (ESP) of the equipment supplying the duct. The equipment ESP shall be the pressure class for the entire supply duct system.

p) All ductwork for smoke control systems shall be leak tested at 1.5 times the maximum design pressure and measured leakage shall not exceed 5%. Smoke control ductwork shall be supported directly from fire-resistance rated, structural elements of the building by substantial, noncombustible supports.

15B-17 SHEET METAL SPECIALTIES:

a) Specialties shall be factory fabricated items designed for low, medium, or high velocity systems as indicated on contract documents. Submit shop drawings on all specialties required with shop drawings of ductwork layout. Specialties shall be as follows:
1. Turning Vanes: Turning vanes shall be equal to an Aero-Dyne, 26-guage, 3’ radius HEP true airfoil design with smoothly-rounded entry nose and extended trailing edge for high efficiency performance. Generated sound power level shall not exceed 54 decibels in band 4 at 2,000 FPM-duct 24 x 24. Fabricate assemblies with the Aero-Dyne Side Rail support system. Install vanes on design centers of 2.4 inches across the full diagonal dimension of the elbow. Tabbed or slotted dimple fasteners are not acceptable. Equals by DuctMate and Duro Dyne.

2. Manual Volume Dampers (Round – Velocities 1500 FPM and less): Provide Ruskin Model MDRS25 dampers suitable for use in temperatures from minus 50 deg F to 250 deg F. Damper shall be butterfly type consisting of circular blade mounted to axle. Frames shall be 20-gauge steel. Damper blades shall be 20-gauge galvanized steel. Leakage through damper in closed position shall not exceed ratings published by Ruskin. Axle shall be 1/2-inch diameter plated steel with sleeve bearing pressed into frame. All parts not protected shall be given one coat of aluminum paint. Provide 2” extended stand-off bracket and locking hand quadrant.

3. Manual Volume Dampers (Rectangular – Velocities 1500 FPM and less): Provide Ruskin Model MD-15 standard dampers suitable for use in temperatures from minus 0 deg F to 240 deg F. Frames shall be 3-inch wide x 22-gauge or 5-inch by 1-inch x 18-gauge galvanized steel channel. Single blades shall be 22-gauge. Multiple blades shall be roll formed, triple-V-groove 18-gauge galvanized steel, maximum of 8-inch wide. Axles shall be 1/2-inch plated steel hex. Bearings shall be molded synthetic and linkage concealed in frame. Maximum single section size shall be 48 inches wide and 48 inches high. Provide 2” extended stand-off bracket and locking hand quadrant. When applications require more than one (1) damper section to fill opening, sections shall be interconnected by appropriate jack shafting.

4. Dampers shall be Carnes, CESCO, Greenheck, Nailor, Prefco, Titus, United McGill, Louvers & Dampers Co., Pottorff or equal.

5. Regulators: Metropolitan RT-100, Series III, concealed damper regulators where duct is concealed in wall or ceiling. Extend the actuator cable to behind the grille or diffuser face and anchor cable to avoid flutter. Rotary cable shall have a minimum torque service factor of 200%. Accessible cable end shall be secured with a factory furnished nylon clamp. Equal by Pottorff and Ventfabrics.

6. Counterbalanced Backdraft Dampers: Unless backdraft dampers have been specified with a piece of equipment, provide Ruskin Model CBD2 counterbalanced backdraft dampers suitable for use in temperatures to 200 deg F and pressure differentials of 40-inch W.G. for 48-inch damper widths, 6-inch W.G. for 36-inch widths, 10-inch W.G. for 24-inch widths, and 16-inch W.G. for 12-inch widths. Damper frame shall be 0.125 wall thickness 6063T5 extruded aluminum with 12-gauge steel brace at each corner. Axles shall be 0.5-inch diameter plated steel supported by ball bearings pressed into frame. Counterbalance weights shall be adjustable and mounted outboard of frame. Finish shall be mill galvanized.

7. Flexible Connections: Ventfabrics Ventglas prefabricated flexible indoor connection of 3.25-inch wide heat and fire resistant neoprene coated glass fabric complying with UL standard 214 with two (2) 3-inch-wide 24-gauge metal strips attached to each edge. Provide stainless steel strips on acid exhaust fans. Indoor connector fabric shall have a minimum tensile strength of 480 lbf/inch in the warp. Ventfabrics Ventlon prefabricated flexible outdoor connection of 3.25-inch-wide heat and UV resistant Hyphalon coated glass fabric complying with UL standard 214 with two (2) 3-inch-wide 24-gauge metal strips attached to each edge. Indoor connector fabric shall have a minimum tensile strength of 530 lbf/inch in the warp and a weather-proof synthetic rubber resistant to UV rays and ozone. Provide Ventfabrics Ventlon glass fabric connection with stainless steel strips on acid exhaust fans. Duro-Dyne Corporation, Ductmate, Ward Industries or approved equal will be acceptable.

8. Access Doors: Provide access doors in ductwork for access to fire dampers, smoke dampers, etc., installed under this contract. Doors and frames shall be furnished in prime coat of gray rust inhibitive paint. Frames shall be seamless one-piece galvanized mild steel. The doors shall be
outer and inner panels one-piece galvanized mild steel. The door insulation shall be a minimum of 1-inch-thick. Gasket shall be positive seal and fasteners progressive action cam locks type (zinc plated). Access doors shall be Nailor, Higgins, Milcor, CESCO or equal.

9. Low-pressure, flexible duct for connection to diffusers shall be Flex Master Type 8M flexible duct in accordance with NFPA, BOA, NFPA 90B, and UL 181, Class I Air Duct. Duct shall be factory insulated with flexible fiberglass insulation with a minimum R-value of 5.0 at a mean temperature of 75 deg F. The insulation shall be covered with a reinforced aluminum pigmented vapor barrier jacket having a permeance of not greater than 0.05 perms when tested in accordance with ASTM E 96, Procedure A. Flexible duct shall be rated for a velocity of at least 4000 feet per minute and suitable for operating temperatures of at least 250 deg F. Internal working pressure rating shall be at least 6 inches W.C. positive and 4 inches W.C. negative. Equivalent flexible ducts by ATCO, McGill AirFlow, Ward Industries, or approved equal. Maximum flexible duct length of run shall be 5 feet unless shown otherwise. Connections shall be either stainless steel bands or nylon straps. Provide vertical flexible ductwork elbows at diffusers with external support: Thermaflex Flexflow Elbow or approved equivalent. Contractor shall submit acoustic performance factors for flexible duct. Performance factors shall be equivalent to the flexible duct specified.

10. Round take-off fittings without dampers from medium, high, and low pressure rectangular ductwork shall be made with Buckley BMD or equal bell mouth fittings. HET (High Efficiency Takeoffs), Buckley Model 3300-D or equal will be allowed, where rectangular duct depth noted on drawings is not 4 inches or greater than the round branch duct size. Round take-off fittings with dampers from medium, high, and low pressure rectangular ductwork shall be made with Buckley HD-BMD or equal bell mouth fittings. HET (High Efficiency Takeoffs), Buckley Model 3300-HD or equal will be allowed, where rectangular duct depth noted on drawings is not 4 inches or greater than the round branch duct size. All dampers shall be provided with extended stand-off bracket, locking handle, square damper bar, and a minimum of two U-bolts.

11. Louvers: (Rain Driven) Provide Ruskin EME420DD, 4" deep weather louvers on all intake louvers on tower roof. Frame and blades shall be 0.081" thick 6063-T5 alloy extruded aluminum. Blades shall be 35 deg. drainable type and with a minimum free area of 44%. Jams shall be constructed with integral downspouts for carrying water from the blades to the louver sill. Screens shall be provided on the interior of the louver and shall consist of 0.75" mesh 0.051" diameter aluminum wire mounted in aluminum frame. Louvers shall pass HEVAC wind driven rain test when tested in accordance with AMCA Standard 511. Louvers shall bear the AMCA certified ratings. Provide a 0.4 mils thick clear, anodized finish; alkyd prime coat following chemical cleaning and pretreatment; or 1.2 mils thick, baked enamel, painted finish with color as noted on plans. Louvers shall be Carnes, Louvers & Dampers, Cesco, Greenheck, Air Balance, Nailor, Prefco, Titus, United McGill and Vest Company, Pottorff or equal

15B-18 GRILLES, REGISTERS, AND DIFFUSERS:

a) Provide grilles, registers, and diffusers as shown on drawings and hereinafter specified. Set all units with rubber gaskets for air tight connection with mounting surface. Unless specified or noted otherwise, grilles and registers mounted on ducts shall have standard margins. See drawings for size and quantity.

b) Install all registers with curve of louver away from line of sight to avoid seeing into space behind louver.

c) Install all registers in masonry construction so that bottom of register starts with masonry construction joint. Support all grilles, registers, and diffusers from Tee bars or structure so as not to stress ceiling tile. Provide proper mounting supplied and arrangements for areas shown. Check Architectural drawings for ceiling and wall construction.

d) All grilles, registers, and diffusers shall be submitted with the following information for Engineers approval prior to installation. Any submittal found delinquent of requested information shall be returned for resubmittal:
1. Airflow.

2. Static Pressure Drop (maximum of 0.08-inch allowed).


4. Throw – 150 FPM, 100 FPM, and 50 FPM.

e) All dimensions indicated on drawings for diffuser neck sizes, face sizes, etc., are generic in nature and should be verified with equipment manufacturer prior to bid letting. Contractor shall be held responsible for compliance with specification. Should a change be required to remain in compliance with specifications, all costs incurred shall be paid by M/C.

f) All registers and grilles shall have angled blades.

g) Equivalent by Titus, Kruger, Carnes, Price, Nailor, or Tuttle & Bailey will be acceptable.

h) See grille, register, and diffuser schedule.

**15B-19 EXHAUST FANS:**

a) Provide exhaust fans as indicated on drawings and schedule.

b) Provide accessories as indicated on schedule.

c) Smoke control, supply and return fans shall have 1.5 times the number of belts required for normal service with a minimum of 2 belts provided.

d) Smoke control, supply and return fans shall be provided with a differential pressure switch equal to a Cleveland Controls AFS-222 or equal with NEMA-3R enclosure, sampling probes and auxiliary contact.

e) All fans shall be AMCA certified for air and sound ratings.

f) Equivalent by Carnes, Acme, Greenheck, Jenn Industries, Loren Cook, Twin City Fan & Blower, or Penn Ventilation.

g) See exhaust fan schedule.

**15B-20 GAS VENT PIPING:**

a) Provide Selkirk Metalbestos Type B round double-wall gas vent piping.

b) Gas vent piping shall be installed in full compliance with the terms of its UL listing, with manufacturer’s installation instruction and with the nationally recognized building codes representing good practice for such installations.

c) Equivalent gas-vent piping by Hart & Cooley and Metal-Fab Inc.

**15B-21 TESTING AND BALANCING PREPARATION:**

a) The M/C shall prepare the system for test and balance as follows:

1. Install, start-up, check out, and adjust all HVAC systems per drawings and specifications and have fully operational with all deficiencies corrected on or before Owner’s substantial completion date.
2. Verify that M/C has installed new filters no more than one day prior to starting test and balance procedure.

3. Verify that all ductwork is clean and sealed tight against leaks.

4. Verify that all controls, dampers, and actuators are installed, adjusted, and calibrated.

5. Secure control dampers after test and balance.

b) The following checks shall be performed on each system installed under this contract:

1. Air Handling Systems:
   A. Clear system of all foreign objects and clean system.
   B. Verify fan rotation.
   C. Check bearing condition and lubrication.
   D. Check fan wheel clearances and fan alignment.
   E. Check motor security to mounting base.
   F. Check alignment of drive.
   G. Verify that proper filter media is installed.
   H. Verify that all control dampers are installed and operable without binding or sticking.
   I. Confirm that all fire, smoke, and volume dampers are installed and in full open position.
   J. Confirm that all air openings in walls above ceilings have been provided.
   K. Check for and repair all excessive air leaks in duct systems, at equipment connections and at coils. Air leaks shall not exceed SMACNA parameters for system pressure.
   L. Verify that all ductwork is constructed and installed in accordance with contract drawings and/or approved ductwork shop drawings.

c) The M/C shall make changes in pulleys, belts, dampers, etc., as required by the balance contractor, at no additional cost to the Owner.

d) The M/C shall install new filters in the air handlers and clean all strainers in the water system just prior to the beginning of the test and balancing.

e) The control manufacturer, or his representative, shall assist the balance contractor in setting automatic dampers, valves, etc., as required:

1. Bring all fans to design RPM.
2. Bring air volume in each air handling system to the design air volume using pitot tube transverse method within a minimum of 16 traverse points.
3. Test and record fan motor data.
4. Test and record static pressure and air volume in high velocity duct extremities.
5. Bring air diffusers and registers to design CFM.

6. Make recommendations for system modifications and adjustments required to facilitate proper system balancing as determined by preceding test.

7. Retest and readjust all system segments affected by system modifications.

8. Bring water systems, including pumps, to design flows.

9. Adjust return air flows where dampers are provided.

**15B-22  AIR AND WATER SYSTEM TESTING AND BALANCING:**

a) All air supply, return and exhaust systems and domestic hot water shall be balanced and adjusted to meet capacity and condition shown in construction documents. This work shall be performed by an independent testing and balancing agency certified by AABC or NEBB.

b) M/C shall submit name of testing and balancing agency to A/E for approval prior to bid performance of work.

c) Balancing shall be performed and report in accordance with latest specification for testing and balancing for air systems and hot water systems, as it pertains to systems installed on this project.

d) Balancing and test reports shall be submitted on standard AABC or NEBB forms.

**END OF SECTION 15B**
DIVISION 15 – MECHANICAL

SECTION 15C – FIRE SPRINKLER SYSTEM

15C-1 GENERAL:

a) Hereinafter, all reference to "this contractor," “the contractor,” etc., unless specifically preceded by a trade category, shall apply to the Sprinkler Contractor.

15C-2 SCOPE:

a) Furnish all design, labor, materials, fabrication, equipment, and services necessary to provide a complete and operational automatic fire sprinkler system as specified herein and as required for satisfactory operation of the system. The building is a one-story building with light hazard occupancy with classroom, dining hall and office space, approximately 7,200 sf (refer to architectural plans for exact area). Provide a dry-pipe system for all entry canopies with overhang four feet or greater as required by NFPA 13.

b) The sprinkler system shall be installed in accordance with the latest edition of NFPA. This requirement does not relieve the Contractor from meeting the requirements set by Owner’s insurance company. All flow indicators, gongs, horns, etc., shall be included as part of this contract.

c) Installed system shall include fire tank, jockey pump and fire pump as well as all associated equipment necessary for complete operation in accordance with NFPA 20, including: fire pump controller, pressure-maintenance-pump and associated controller.

15C-3 FEES AND PERMITS:

a) The Contractor shall secure and pay for all permits, license, and inspections necessary in conjunction with this work. In addition, the contractor shall pay for all tap fees and equipment costs associated with the fire sprinkler system.

15C-4 CAD FILE REQUESTS:

a) CAD files are the property of the D/E. CAD files are only available upon documented written request which must be forwarded to the D/E office. Prior to receiving any CAD files, the contractor must sign a Second Party User Agreement and Drawing Request Form (available upon request from our office) which must be forwarded back to the D/E office prior to any CAD files being released. BIM/Revit models will not be available.

15C-5 PROTECTION OF WORK:

a) The Contractor shall take the necessary precautions required to protect his work as well as the work of other trades against any damages.

15C-6 SUBMITTALS AND APPROVALS:

a) All material submitted shall be contained in brochure type binders, clearly labeled, and identified. Each submittal shall be complete, with all items listed in schedule form shown type, manufacturer, catalog number, finish shop drawings or descriptive literature for the purpose of identifying the equipment, and Engineer’s reference number. Failure to comply with these requirements will result in return of submittal for resubmission.

b) Contractor shall submit scaled layout drawings including, but not limited to, head locations, pipe sizes, locations, elevations, and slopes of horizontal runs, wall and floor penetrations, and connections. Indicate interface and spatial relationships between piping and proximate equipment. Show hanger locations. Plans shall be submitted prior to A/E for head locations approval.
At project closeout, submit dimensioned, record drawings to A/E of installed fire protection piping and equipment.

The sprinkler system shall be a complete system as required by local authorities. All wiring required for the system shall be provided by the Contractor and shall be included in the submittal package. Submit to Agency having jurisdiction for approval. Submit one (1) approved copy, bearing stamp and/or signature of Agency having jurisdiction, before proceeding with installation.

Submit certification upon completion of fire protection piping work which indicates that work has been tested in accordance with NFPA 13 and NFPA 20, and also that system is operational, complete, and has no defects.

15C-7 CODES AND ORDINANCES:

The Contractor shall comply with all requirements, regulations, code, ordinance, ruling or Fire Underwriters’ requirements, NFPA, and Owner’s insurance company applicable to this class of work. Furthermore, they shall include, but shall not be limited to, codes listed in other sections of these specifications.

Provide fire protection products in accordance with UL standards: provide UL label on each product.

Install fire protection systems in accordance with local regulations of fire department or fire marshal. Comply with local Fire Department/Marshal regulations for sizes, threading, and arrangement of connections for fire department equipment to standpipe systems.

15C-8 ACCEPTABLE MANUFACTURERS:

Viking, Reliable, or equal will be acceptable.

15C-9 QUALIFICATION OF SPRINKLER CONTRACTOR:

Fire protection work shall be installed by a firm with at least three (3) years of successful installation experience on projects with fire protection work similar to that required for project by a qualified Contractor (sprinkler fitter or per jurisdictional dictates). The Contractor’s design shall be stamped by a Registered Professional Engineer licensed in the state of the project.

15C-10 WATER SERVICE:

Contractor shall include in his bid the installation of the required underground water service line to the fire tank at the location(s) indicated on the drawings. Provide necessary materials and labor to conform to all local requirements and include the cost of all work and materials in connection with the service. This Contractor shall perform necessary hydraulic calculations required to size the line in accordance with applicable provisions of NFPA including NFPA 13.

15C-11 TESTING AND FLUSHING OF SYSTEM:

All piping shall be hydrostatically tested for a period of two (2) hours at not less than 200 psi pressure. If leaks appear, lines shall be drained, leaks repaired, and test repeated. No piping shall be concealed in any manner before being tested and approved.

Tests shall be made in the presence of an inspector from the authorities having jurisdiction. The Owner shall be notified of time of all tests in advance of the date.

15C-12 EQUIPMENT AND MATERIALS:

All materials and equipment furnished as part of this contract shall be UL listed, Owner’s insurance company approved, and in compliance with applicable provisions of the NFPA.
b) No plastic piping will be allowed.

15C-13 SPRINKLER HEADS:

a) Unless indicated otherwise, sprinkler heads shall be as follows:

1. Exposed areas without ceiling brass, unplated sprinklers. Provide sprinkler guards on all exposed pendant or upright sprinkler heads.

2. Finished ceiling areas recessed mount with one-piece, cast-brass escutcheon with set-screws and with all parts polished chrome.

b) Temperature rating of fusible plug or link of sprinklers shall be appropriate for the ambient conditions in the immediate areas.

c) Contractor shall furnish spare sprinkler heads identical to each type installed in accordance with the following schedule:

<table>
<thead>
<tr>
<th># Installed</th>
<th># of Spares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 300</td>
<td>6</td>
</tr>
<tr>
<td>More than 300</td>
<td>12</td>
</tr>
</tbody>
</table>

d) Spare sprinkler heads shall be mounted in emergency sprinkler cabinet. Cabinet shall be located in basement storage room 008.

15C-14 DESIGN AND CALCULATION:

a) Contractor shall perform necessary calculations required for proper design and installation of the sprinkler system for the entire building. All design calculations and layout of the sprinkler system network shall be based on the specifications and accompanying drawings. Request for HVAC duct and equipment relocations shall be submitted to Engineer one (1) week before the bid opening date. No sprinkler pipe penetration will be allowed through HVAC duct system. No sprinkler piping shall be installed above electrical panels.

b) Contractor shall include in design a fire tank and fire pump. The contractor shall design a fire tank reservoir in location shown on plan with sufficient capacity to operate wet suppression fire sprinkler system for a minimum of two hours.

15C-15 FIRE DEPARTMENT CONNECTIONS:

a) Contractor shall provide connection through exterior building wall where required. Coordinate the exact location, pipe threads, and fittings with the local fire department to ensure exact match.

15C-16 MISCELLANEOUS EXECUTION:

a) All sprinkler heads shall be positioned approximately half way between rows of lights and at approximately center of ceiling tile. It shall be the responsibility of the sprinkler designing engineer to accommodate this requirement. Failure to comply with this requirement will result in return of submitted design for resubmission.

b) Unless coordinated with other trades, all piping shall be installed within 6 inches of structure. Offset around obstacles as necessary and return piping to within 6 inches of structure as close to offset as possible. Branch piping shall be run between concrete stem and steel joists in rooms without ceilings.

c) Sprinkler heads shall be installed in the center of ceiling tiles.
**15C-17 ELECTRICAL REQUIREMENTS:**

a) Electric tamper switches are not shown but are required wherever a shutoff valve is installed in the sprinkler system. The Contractor shall be responsible for providing the tamper switch and associated wiring to connect the fire alarm system. All wiring shall be in accordance with Division 16.

b) Electric flow switches are not shown but are required. The Contractor shall be responsible for providing the flow switch and associated wiring to connect to the fire alarm system (or alarm communicator). All wiring shall be in accordance with Division 16.

c) All flow switches, gongs, horns, etc., required by the local code officials or authority with jurisdiction shall be included. All wiring shall be in accordance with Division 16.

**15C-18 FIRE PUMP CONTROLLER:**

a) Provide dedicated fire pump controller. Controller shall be provided with fusible service disconnect and be service entrance rated. Controller shall be sized based on size of fire pump required for complete fire sprinkler system.

b) Controller shall meet all NFPA 20 requirements.

c) Coordinate exact size of fire pump with E/C to ensure accurate electrical service is provided to fire pump controller.

d) Controller shall be included with fire pump alarm and signal to indicate operation of equipment.

**15C-19 INSPECTIONS AND TESTING:**

a) Perform tests and inspections.

b) Tests and Inspections:
   
   1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
   2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
   3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
   4. Energize circuits to electrical equipment and devices.
   5. Start and run excess-pressure pumps.
   6. Coordinate with fire-alarm tests. Operate as required.
   7. Coordinate with fire-pump tests. Operate as required.
   8. Verify that equipment hose threads are same as local fire-department equipment.

c) Sprinkler piping system will be considered defective if it does not pass tests and inspections.

d) Prepare test and inspection reports.

e) The fire sprinkler system Engineer of Record shall inspect the sprinkler system installation for conformance with the sprinkler system design documents, the requirements of NFPA 13, and all codes applicable to the design and installation. Upon completion of the inspection, the Engineer of Record shall submit to the Contractor, Architect, and Engineer a report listing all deficiencies, conflicts, errors, etc., found during the inspection. The report shall be submitted no less than two (2) weeks prior to scheduled date of substantial completion and shall bear the seal and signature of the Design Engineer. Work required addressing deficiencies, conflicts, errors, etc., listed in the fire sprinkler Engineer of Record's inspection report shall be performed by the Contractor and his own expense. As-built record drawings and hydraulic calculations shall be revised to include any and all additions and modifications, and shall bear the seal and signature of the Engineer of Record.
f) Upon completion of the fire sprinkler system installation, the Engineer of Record shall inspect and test the system in accordance with NFPA 13 requirements for system acceptance and system operational tests in the presence of the sprinkler system Design Engineer of record and a representative of the authority having jurisdiction. The “Contractors Material and Test Certificate for Aboveground Piping” and a report of system’s operational tests shall be submitted with the fire sprinkler as-built record documents. The acceptance test certificates and operational test reports shall indicate the date of the tests and bear the signatures of the installing contractors performing the tests, and the Design Engineer of Record and the authority having jurisdiction witnessing the tests.

END OF SECTION 15C
TABLE OF CONTENTS

DIVISION 16 - ELECTRICAL

SECTION 16A - GENERAL REQUIREMENTS

16A-1 CONTRACT DOCUMENTS ............................................................................................................. 1
16A-2 SPECIFICATION FORM AND DEFINITIONS ................................................................................. 1
16A-3 GENERAL EXTENT OF WORK ...................................................................................................... 1
16A-4 LOCAL CONDITIONS ...................................................................................................................... 3
16A-5 CODES, ORDINANCES, RULES, AND REGULATIONS ................................................................ 3
16A-6 CONTRACT CHANGES .................................................................................................................. 4
16A-7 LOCATIONS AND INTERFERENCES ............................................................................................ 4
16A-8 SYSTEMS PERFORMANCE ........................................................................................................... 5
16A-9 WARRANTY ..................................................................................................................................... 5
16A-10 MATERIALS, EQUIPMENT, AND SUBSTITUTIONS .................................................................... 5
16A-11 SHOP DRAWINGS, OPERATING, AND MAINTENANCE INSTRUCTIONS ................................. 7
16A-12 PROPOSED VALUE ENGINEERING/PROJECT SCOPE REVISIONS ......................................... 8
16A-13 CAD FILE REQUESTS .................................................................................................................... 8
16A-14 CUTTING AND PATCHING ......................................................................................................... 8
16A-15 MUTILATION ................................................................................................................................ 8
16A-16 EXCAVATION AND BACKFILL ................................................................................................... 8
16A-17 SETTING, ADJUSTMENT, AND EQUIPMENT SUPPORTS .......................................................... 9
16A-18 START-UP, CHANGE-OVER, TRAINING AND OPERATIONAL CHECKS ................................. 9
16A-19 MAINTENANCE OF SYSTEMS ..................................................................................................... 9
16A-20 PROTECTION AND CLEANING OF SYSTEMS AND EQUIPMENT .............................................. 10
16A-21 PAINTING OF MATERIALS AND EQUIPMENT ........................................................................... 10
16A-22 RECORDING AND REPORTING TESTS AND DATA ................................................................. 10
16A-23 IDENTIFICATION OF WIRING AND EQUIPMENT ...................................................................... 11
16A-24 SLEEVES ..................................................................................................................................... 12
16A-25 RECORD DOCUMENTS .............................................................................................................. 13
**DIVISION 16 - ELECTRICAL**

**SECTION 16B - GENERAL POWER AND LIGHTING**

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>16B-1</td>
<td>CIRCUITING</td>
<td>1</td>
</tr>
<tr>
<td>16B-2</td>
<td>CONDUIT APPLICATION</td>
<td>1</td>
</tr>
<tr>
<td>16B-3</td>
<td>STEEL CONDUIT</td>
<td>2</td>
</tr>
<tr>
<td>16B-4</td>
<td>PLASTIC CONDUIT</td>
<td>2</td>
</tr>
<tr>
<td>16B-5</td>
<td>CONDUIT INSTALLATION</td>
<td>3</td>
</tr>
<tr>
<td>16B-6</td>
<td>INSERTS AND HANGERS</td>
<td>4</td>
</tr>
<tr>
<td>16B-7</td>
<td>BUSHINGS AND LOCKNUTS</td>
<td>5</td>
</tr>
<tr>
<td>16B-8</td>
<td>OUTLET BOXES</td>
<td>5</td>
</tr>
<tr>
<td>16B-9</td>
<td>LOCATION OF OUTLET BOXES</td>
<td>5</td>
</tr>
<tr>
<td>16B-10</td>
<td>PULL BOXES, WIREWAYS, AND GUTTERS</td>
<td>7</td>
</tr>
<tr>
<td>16B-11</td>
<td>CONDUCTORS</td>
<td>7</td>
</tr>
<tr>
<td>16B-12</td>
<td>CONDUCTOR INSTALLATION</td>
<td>8</td>
</tr>
<tr>
<td>16B-13</td>
<td>CONDUCTOR COLOR CODING</td>
<td>8</td>
</tr>
<tr>
<td>16B-14</td>
<td>FUSES</td>
<td>9</td>
</tr>
<tr>
<td>16B-15</td>
<td>SAFETY SWITCHES</td>
<td>9</td>
</tr>
<tr>
<td>16B-16</td>
<td>WALL SWITCHES</td>
<td>10</td>
</tr>
<tr>
<td>16B-17</td>
<td>RECEPTACLES</td>
<td>10</td>
</tr>
<tr>
<td>16B-18</td>
<td>FLUSH WALL PLATES</td>
<td>11</td>
</tr>
<tr>
<td>16B-19</td>
<td>LIGHTING FIXTURES</td>
<td>11</td>
</tr>
<tr>
<td>16B-20</td>
<td>CIRCUIT BREAKER PANELBOARDS</td>
<td>12</td>
</tr>
<tr>
<td>16B-21</td>
<td>CIRCUIT BREAKER DISTRIBUTION PANELBOARDS</td>
<td>13</td>
</tr>
<tr>
<td>16B-22</td>
<td>TRANSIENT VOLTAGE SURGE SUPPRESSION</td>
<td>14</td>
</tr>
<tr>
<td>16B-23</td>
<td>GROUNDING</td>
<td>17</td>
</tr>
<tr>
<td>16B-24</td>
<td>PLENUM CABLE FIRE RATED PATHWAY DEVICE</td>
<td>19</td>
</tr>
<tr>
<td>16B-25</td>
<td>VACANCY SENSORS</td>
<td>20</td>
</tr>
<tr>
<td>16B-26</td>
<td>TIME SWITCHES</td>
<td>20</td>
</tr>
<tr>
<td>16B-27</td>
<td>FIRE ALARM SYSTEM SPECIFICATION</td>
<td>20</td>
</tr>
</tbody>
</table>
DIVISION 16 – ELECTRICAL

SECTION 16A – GENERAL REQUIREMENTS

16A-1 CONTRACT DOCUMENTS:

a) All contract documents including drawings, alternates, addenda, and modifications preceding this Specification Division are applicable to Electrical Contractor and his subcontractors and material suppliers.

16A-2 SPECIFICATION FORM AND DEFINITIONS:

a) These Specifications are abbreviated form and contain incomplete sentences. Omissions of words or phrases such as “the Contractor shall,” “shall be,” “as noted on the drawings,” “according to the drawings,” “a,” “an,” “the,” and “all” are intentional. Omitted words and phrases shall be supplied by inference.

b) When a word such as “proper,” “satisfactory,” “equivalent,” and “as directed” is used, it requires Engineer’s review.

c) “Provide” means furnish and install.

d) “Working Day” wherever used in these Specifications, shall mean the normal working days Monday through Friday, exclusive of Saturday, Sunday, and federally observed holidays.

e) Architect/Engineer hereinafter abbreviated A/E shall mean both the Design Architects and the Design Engineers.

f) Design Engineer hereinafter abbreviated D/E shall mean the engineering firm, RTM Engineering Consultants, LLC 9225 Indian Creek Pkwy, Suite 1075, Overland Park, KS 66210, Telephone (913) 322-1400. Contact Person: April L. Halling

g) General Contractor hereinafter abbreviated G/C shall mean the person or company and their subcontractors who enter into contract with the Owner to perform the general division work.

h) Electrical Contractor hereinafter abbreviated E/C shall mean the person or company and their subcontractors who enter into contract with the G/C to perform the electrical division work.

i) Mechanical Contractor hereinafter abbreviated M/C shall mean the person or company and their subcontractors who enter into contract with the G/C to perform the mechanical division work.

j) Equipment and/or materials manufacturer hereinafter abbreviated E/M shall mean the manufacturer of equipment or materials specified or referred to.

16A-3 GENERAL EXTENT OF WORK:

a) Provide electrical systems indicated on drawings, specified or reasonably implied. Provide every device and accessory for proper operation and completion of mechanical systems. In no case will claims for “Extra Work” be allowed for work about which E/C could have informed himself before bids were taken.

b) E/C shall familiarize himself with equipment provided by other contractors, which require electrical connections and controls.

c) Make required electrical connections to equipment provided under Architectural and mechanical divisions of this project, except where shown or specified otherwise. Make required internal field wiring modifications indicated on wiring diagrams of factory installed control system for control sequence specified. These field modifications shall be limited to jumper connections and connection
of internal wiring to alternate terminal block lugs. Cost for field modifications requiring re-wiring of factory installed control systems for equipment provided by G/C or M/C shall be included in base bid of each respective contractor.

d) Check electrical data and wiring diagrams received from M/C for compliance with project voltages, wiring, controls, and protective devices on electrical drawings. Promptly bring discrepancies found to attention of A/E for a decision.

e) Provide safety disconnect switches, contactors, and manual and magnetic motor starters (starters are required for any motor 3/4hp or larger) for all mechanical and electrical equipment requiring such devices, whether specifically scheduled or shown on the drawings or not – no adds shall be paid for this equipment required for proper operation of the equipment after the bid. Coordinate with the M/C and omit these devices only where they are included as part of the equipment, unless scheduled otherwise on the drawings, and only where approved by the A/E. Where approval has not been obtained from the A/E prior, include all costs for this equipment in the base bid. With exception of factory installed devices, provide safety disconnect switches, contactors, and motor starters by one manufacturer to allow maximum interchangeability of repair parts and accessories for these devices.

f) Coordinate closely with M/C and P/C for all mechanical, plumbing and/or HVAC equipment overcurrent protection. Where the provided equipment is listed with a ‘Maximum Fuse Size’, a fused disconnect switch shall be provided with fuses sized per the manufacturer’s listing, regardless of what is shown on the drawings. Where the equipment is listed with a ‘Maximum Overcurrent Protection (MOCP)’, a fused or non-fused disconnect switch shall be provided as indicated and scheduled on the drawings. Include all costs as necessary for coordination with the M/C and including appropriate disconnecting means as required. Where overcurrent or disconnecting means sizes on the electrical drawings do not match the mechanical or plumbing drawings or the provided equipment, the E/C shall include costs for the larger sizes (including upsizing wiring and conduit to match overcurrent size) in the base bid. Notify the A/E in all instances.

g) Coordinate closely with M/C and P/C for all mechanical, plumbing and/or HVAC equipment electrical connection. Disconnecting means as indicated on the drawings is shown schematically. E/C shall verify mounting location and equipment connection points with the M/C and connect all equipment per the manufacturer’s requirements. E/C shall verify mounting location of all disconnecting means with the E/M and install per those requirements and so as not to impact equipment performance, access, operation and/or warranty. Disconnecting means shall be installed in an accessible location as required by the National Electric Code. Provide structural supports securely attached to the building structure separate from mechanical equipment and/or supports for mounting of disconnecting means as required and include costs for all such supports and associated equipment in the base bid. Maintain all conduit and conductor feeds to equipment concealed inside the building or below grade and stub up at the equipment inside the curb or at equipment supports. Unistrut shall not be allowed for any roof penetrations.

h) Coordinate closely with G/C, M/C and P/C for all electrical, lighting, mechanical, plumbing and/or HVAC equipment locations. Refer to the mechanical, plumbing and architectural plans for exact locations and quantities of all HVAC equipment, plumbing equipment, smoke dampers, fire/smoke dampers, pumps, miscellaneous equipment, etc. Locations and quantities shown on the electrical drawings are approximate and may not reflect final position or quantity. The electrical contractor shall be responsible for familiarizing himself with all drawings and specifications in the construction documents, not just the electrical drawings. The electrical contractor shall provide final connection to all equipment and lighting. Where equipment or lighting is shown on the mechanical, plumbing or architectural plans but not shown on the electrical plans, electrical contractor shall provide power to the equipment based on equipment requirements as scheduled or noted, specified and/or per the manufacturer’s requirements and include all costs in the base bid. Location shown of electrical connection to mechanical, plumbing or other equipment is schematic and may not reflect actual connection points. Rough-in and connection to the equipment shall be per the equipment manufacturer’s requirements, the National Electric Code and as required to keep electrical connections concealed from view. All rough-in requirements shall be verified with the respective contractor and equipment manufacturer prior to any work being performed.
i) Electrical controls in equipment rooms, and control rooms shall be grouped in accessible locations and arranged according to function. Where possible use group control panels and combination starters in lieu of individually enclosed devices.

j) All electrical work as required to provide temporary power for construction shall be the responsibility of the electrical contractor. Include all costs as required in the base bid. Coordinate and verify all requirements with the general contractor.

16A-4 LOCAL CONDITIONS:

a) Visit site and determine existing local conditions affecting work in contract.

b) Failure to determine site conditions or nature of existing or new construction will not be considered a basis for granting additional compensation.

16A-5 CODES, ORDINANCES, RULES, AND REGULATIONS:

a) Provide work in accordance with applicable codes, rules, ordinances, and regulations of Local, State, and Federal Governments and other authorities having lawful jurisdiction.

b) Conform to latest editions and supplements of the following codes, standards, or recommended practices.

1. CITY CODES:
   A. 2006 International Building Codes
   B. 2006 International Fire Code

2. SAFETY CODES:
   B. Occupational Safety and Health Standards – Department of Labor.
   C. Specifications for Making Buildings and Facilities Accessible To, and Usable By, the Physically Handicapped – American Standards Institute ANSI A117.1.

3. NATIONAL FIRE CODES:

4. UNDERWRITERS LABORATORIES, INC.:
   A. All materials, equipment and component parts of equipment shall bear UL labels whenever such devices are listed by UL.

c) Drawings and specifications indicate minimum construction standards, but should any work indicated be sub-standard to any ordinances, laws, codes, rules, or regulations bearing on work, E/C shall promptly notify A/E in writing before proceeding with work so that necessary changes can be made. However, if E/C proceeds with work knowing it to be contrary to any ordinances, laws, rules, and regulations, he shall thereby have assumed full responsibility for and shall bear all costs required to correct non-complying work.
d) E/C shall secure and pay for necessary permits and certificates of inspection required by governmental ordinances, laws, rules, or regulations. Keep a written record of all permits and inspection certificates and submit copies to A/E with request for final inspection.

16A-6 CONTRACT CHANGES:

a) Changes or deviations from contract; including those for extra or additional work must be submitted in writing for review of A/E. No verbal orders will be recognized.

b) Changes in the work shall be submitted in accordance with AIA Document A201, General Conditions of the Contract for Construction.

c) All change proposals shall be itemized indicating separately the costs for materials, labor, restocking charges, freight, bonds, insurance, overhead, and profit. All materials shall be listed separately with quantities and individual unit prices. Labor factors shall be from a nationally recognized source with appropriate adjustments.

d) All submitted breakdowns shall be broken out individually for labor and material for each separate line item in the respective supplemental instruction, contract change directive, or proposal request. Items submitted with lump sums will be returned un-reviewed.

e) The maximum allowable profit for any change order shall be ten percent (10%).

f) See Example below:

PRICING SHEET

<table>
<thead>
<tr>
<th>Material</th>
<th>Units</th>
<th>Unit Measure</th>
<th>Material Per Unit</th>
<th>Man Hours Per Unit</th>
<th>Total Man Hours</th>
<th>Materials Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drill &amp; Patch Holes</td>
<td>1</td>
<td>lot</td>
<td>$1,285.00</td>
<td>3.000</td>
<td>3.00</td>
<td>$1,285.00</td>
</tr>
<tr>
<td>4&quot; LB w/cover</td>
<td>6</td>
<td>ea</td>
<td>$105.23</td>
<td>2.750</td>
<td>16.50</td>
<td>$631.38</td>
</tr>
<tr>
<td>4&quot; Compr. Conn</td>
<td>6</td>
<td>ea</td>
<td>$87.70</td>
<td>1.000</td>
<td>6.00</td>
<td>$526.20</td>
</tr>
<tr>
<td>4&quot; GRC</td>
<td>40</td>
<td>ea</td>
<td>$9.04</td>
<td>0.280</td>
<td>11.20</td>
<td>$361.57</td>
</tr>
<tr>
<td>4&quot; cut &amp; thread labor</td>
<td>4</td>
<td>ea</td>
<td>$0.00</td>
<td>1.600</td>
<td>6.40</td>
<td>$0.00</td>
</tr>
<tr>
<td>4&quot; GRC-PVC Adptr.</td>
<td>16</td>
<td>ea</td>
<td>$4.70</td>
<td>0.675</td>
<td>10.72</td>
<td>$75.20</td>
</tr>
<tr>
<td>4&quot; GRC 90 Ell</td>
<td>4</td>
<td>ea</td>
<td>$56.34</td>
<td>1.500</td>
<td>6.00</td>
<td>$225.36</td>
</tr>
<tr>
<td>4&quot; Sch 40 PVC</td>
<td>460</td>
<td>ea</td>
<td>$2.25</td>
<td>0.600</td>
<td>27.60</td>
<td>$1,034.03</td>
</tr>
<tr>
<td>Resocking Fee 20%</td>
<td>1</td>
<td>lot</td>
<td>$212.26</td>
<td>0.000</td>
<td>0.00</td>
<td>$212.26</td>
</tr>
<tr>
<td>Return Freight</td>
<td>1</td>
<td>lot</td>
<td>$26.40</td>
<td>0.000</td>
<td>0.00</td>
<td>$26.40</td>
</tr>
<tr>
<td>Deduct</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&quot; EMT</td>
<td>-330</td>
<td>ea</td>
<td>$2.46</td>
<td>0.045</td>
<td>(14.85)</td>
<td>($812.79)</td>
</tr>
<tr>
<td>4&quot; EMT 90 Ell</td>
<td>-6</td>
<td>ea</td>
<td>$26.64</td>
<td>1.100</td>
<td>(6.60)</td>
<td>($159.84)</td>
</tr>
<tr>
<td>4&quot; EMT Cplg</td>
<td>-39</td>
<td>ea</td>
<td>$2.27</td>
<td>0.270</td>
<td>(10.53)</td>
<td>($88.66)</td>
</tr>
<tr>
<td>SUBTOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>55.44</td>
<td>$3316.12</td>
</tr>
<tr>
<td>SALES TAX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.125%</td>
<td>$203.11</td>
</tr>
<tr>
<td>LABOR</td>
<td>55.4</td>
<td>MH</td>
<td>$21.74</td>
<td></td>
<td></td>
<td>$1,205.27</td>
</tr>
<tr>
<td>5% OVERHEAD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$236.23</td>
</tr>
<tr>
<td>8% PROFIT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>396.86</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$3575.59</td>
</tr>
</tbody>
</table>

16A-7 LOCATIONS AND INTERFERENCES:

a) Locations of equipment, piping, and other mechanical work are indicated diagrammatically by electrical drawings. Lay out work from dimensions on Architectural and Structural Drawings. Verify equipment size from manufacturer’s shop drawings.

b) Study and become familiar with contract drawings of other trades and in particular the general construction drawings and details to obtain necessary information for figuring installation. Cooperate
with other workmen and install work to avoid interference with their work. Minor deviations not affecting design characteristics, performance, or space limitations may be permitted if reviewed by A/E prior to installation.

c) Any conduit, apparatus, appliance, or other electrical item interfering with proper placement of other work as indicated on drawings, specified, or required shall be removed and if so shown, relocated and reconnected without extra cost. Damage to other work caused by the E/C, his subcontractor, his workmen, or by any cause whatsoever, shall be restored as specified for new work.

d) Do not scale mechanical and electrical drawings for dimensions. Accurately lay out work from dimensions indicated on architectural drawings unless such is found in error.

16A-8 SYSTEM PERFORMANCE:

a) Final acceptance of work shall be subject to the condition that all systems, equipment, apparatus, and appliances operate satisfactorily as designed and intended; work shall include required adjustment of systems and control equipment installed under this specification.

16A-9 WARRANTY:

a) E/C warranties to Owner and Architect the quality of materials, equipment, workmanship, and operation of equipment provided under this specification division for a period of one (1) year from and after date of substantial completion of building and acceptance of mechanical systems by Owner.

b) Where manufacturers’ warranties expire during the one (1) year warranty period, one (1) year warranty period is defined as year after date of substantial completion. E/C shall include provisions for extending warranty for the full one (1) year period and shall cost for warranty extension in his base bid.

c) E/C warrants to Owner and Architect that on receipt of written notice from either of them within one (1) year warranty period following date of acceptance, all defects that have appeared in materials and/or workmanship shall be promptly corrected to condition required by contract documents at E/C’s expense.

d) The above warranty shall not supersede any separately stated warranty or other requirements by law or by these specifications.

e) Keep an itemized list of all equipment warranties listing equipment by name, mark, and type along with length and expiration date of each warranty. Submit copies to A/E with request for final inspection.

f) If the Architect’s specification includes a warranty that exceeds the above warranty requirements, the Architect’s warranty shall take precedence.

16A-10 MATERIALS, EQUIPMENT, AND SUBSTITUTIONS:

a) The intent of these specifications is to allow ample opportunity for E/C to use his ingenuity and abilities to perform the work to his and the Owner’s best advantage, and to permit maximum competition in bidding on standards of materials and equipment required.

b) Material and equipment installed under this contract shall be first class quality, new, unused, and without damage.

c) In general, these specifications identify required materials and equipment by naming first the manufacturer whose product was used as the basis for the project design and specifications. The manufacturer’s product, series, model, catalog, and/or identification numbers shall set quality and capacity requirements for comparing the equivalency of other manufacturer’s products in general. Where models are listed or scheduled with information that does not match specified manufacturer’s
data, the larger, more expensive and/or restrictive requirement between the schedule and the manufacturer’s data shall be met and included. Where other manufacturer’s names are listed, they are considered an approved manufacturer for the product specified; however, the listing of their names implies no prior approval of any product unless specific model or catalog numbers are listed in these specifications or in subsequent addenda. The naming of a manufacturer, or even a model number, does not alleviate the contractor from being required to meet or submit equipment which meets all of the criteria and items listed in the specifications or shown on the plans even if the specified model and/or manufacturer does not. All requirements on the drawings must be met, not just the specific model number or manufacturer. Where other than first named products are used for E/C’s base bid proposal, it shall be his responsibility to determine prior to bid time that his proposed materials and equipment selections are products of approved manufacturers, which meet or exceed the specifications, fit physically in the spaces provided, are compatible with all other systems and are acceptable to the D/E.

d) Where varying or conflicting information, notes or specifications may be shown in different locations on the drawings, schedules, or specifications, all requirements are required to be met and the worst case or more expensive and/or restrictive option should be included where duplicate information is not the same. Notify A/E for clarification.

e) Where materials or equipment are described but not named, provide required items of first quality, adequate in every respect for intended use. Such items shall be submitted to A/E for review prior to procurement.

f) PRIOR TO RECEIPT OF BIDS, IF E/C WISHES TO INCORPORATE PRODUCTS OTHER THAN THOSE NAMED IN SPECIFICATIONS IN HIS BASE BID, HE SHALL SUBMIT A WRITTEN REQUEST FOR REVIEW OF SUBSTITUTIONS TO D/E NOT LESS THAN SEVEN (7) WORKING DAYS PRIOR TO BID TIME. D/E WILL REVIEW REQUESTS AND ACCEPTABLE ITEMS WILL BE LISTED IN AN ADDENDUM ISSUED TO PRINCIPAL BIDDERS.

g) Materials and equipment proposed for substitutions shall be equal to or superior to that specified in construction, efficiency, utility, aesthetic design, and color as determined by A/E, whose decision shall be final and without further recourse. Physical size of substitute brand shall be no larger than space provided including allowances for access for installation and maintenance. Requests must be accompanied by two (2) copies of complete descriptive and technical data including E/M’s name, model, and catalog number, photographs or cuts, physical dimensions, operating characteristics, and any other information needed for comparison.

h) In proposing a substitution prior to or subsequent to receipt of bids, include in such proposal cost of altering other elements of project, including adjustments in mechanical/electrical service requirements necessary to accommodate such substitution; whether such affected elements are under this contract or under separate contracts.

i) Within seven (7) working days after bids are received, apparent lower bidder shall submit to A/E for approval three (3) copies of a list of all major items of equipment he intends to provide. As soon as practicable and within 30 working days after award of contract, E/C shall submit shop drawings for equipment and materials to be incorporated in work, for A/E review. Where 30 day limit is insufficient for preparation of detailed shop drawings on major equipment or assemblies, E/C shall submit manufacturer’s descriptive catalog data and indicate date such detailed shop drawings will be submitted along with manufacturer’s certification that order was placed within 30 working day limit.

j) After execution of contract, substitution of product brands for those named in Specifications will be considered, only if:

1. Request is received within 30 days after contract date and request includes statement showing credit due Owner, if any, if substitution products are used, or

2. Owner requests consideration be given to substitute brands.
16A-11  SHOP DRAWINGS, OPERATION, AND MAINTENANCE INSTRUCTIONS:

a) Unless noted differently in the general requirements of the specifications, E/C shall furnish the following option:

1. Electronic PDF submittals to the Architect. Shop drawings submitted electronically shall be returned electronically via the same path.

b) Where catalog cuts are submitted for review, conspicuously mark or provide schedule of equipment, capacities, controls, fittings, sizes, etc., that are to be provided. Mark each submitted item with applicable section and paragraph numbers of these specifications, or plan sheet number, when item does not appear in specifications. Where equipment submitted does not appear in base specifications or specified equivalent, submittals shall be marked with applicable alternate numbers, change order numbers, or letters of authorization. Each submittal shall contain at least two (2) sets of original catalog cuts. Each catalog sheet shall bear E/M’s name and address. All shop drawings on materials and equipment listed by UL shall indicate UL approval on submittal.

c) E/C shall check all shop drawings to verify that they meet specifications and/or drawing requirements before forwarding submittals to the A/E for their review. All shop drawings submitted to A/E shall bear E/C approval stamp which shall indicate that E/C has reviewed submittals and that they meet specification and/or drawing requirements. E/C’s submittal review shall specifically check for, but not be limited to, the following: equipment capacities, physical size in relation to space allowed; electrical characteristics, provisions for supply, return, and drainage connections to building systems. All shop drawings not meeting E/C’s approval shall be returned to his supplier for resubmittal.

d) No shop drawing submittals will be considered for review by the A/E without E/C’s approval stamp, or that have extensive changes made on the original submittal as a result of E/C’s review.

e) A/E will not be responsible for the cost of returning shop drawing submittals that are submitted to them without E/C’s review and approval stamp. A letter will be sent to E/C by either the Architect or Engineer indicating receipt of an improper submittal. E/C shall acknowledge receipt of letter and indicate his plans for pick-up or resubmitting. A/E will hold improper submittals for pick-up by E/C or supplier for 15 working days after date of receipt. If not picked up by the 16th working day, submittals will be disposed of by A/E.

f) A/E’s review of shop drawings will not relieve E/C of responsibility for deviations from drawings and specifications unless such deviations have been specifically approved in writing by Owner or his representative, nor shall it relieve E/C of responsibility for errors in shop drawings. No work shall be fabricated until A/E’s review has been obtained. Any time delay caused by correcting and resubmitting shop drawings will be E/C’s responsibility.

g) Operating and Maintenance Instructions:

1. Submit with shop drawings of equipment: copies of installation, operating, maintenance instructions, and parts list for equipment provided. Instructions shall be prepared by E/M.

2. Keep in safe place keys and wrenches furnished with equipment under this contract. Present to Owner and obtain a receipt for same upon completion of project.

3. Contractor shall provide all final documents including drawings, shop drawings, etc., in PDF format on a single disk to Owner. A total of five (5) CD’s shall be provided, three (3) to the Owner and two (2) to A/E. No exceptions will be allowed to this requirement. Videotaping, as specified in other parts of this specification, will also be required at closeout.

GENERAL REQUIREMENTS 16A p7
16A-12 PROPOSED VALUE ENGINEERING/PROJECT SCOPE REVISIONS:

a) Where design revisions are requested/required based on value-engineering or proposed changes in project scope, the contractor shall include in his proposed cost savings or adds the necessary MEP design fees that are required for modifying construction documents and associated meetings. In order to determine that value to be included, the contractor shall submit to the A/E the proposed scope of the work required for the changes at least 7 days prior to required pricing submittal so that the design fees can be accurately determined and included. Design work and drawing changes will only commence once the design fee is established and a signed agreement returned to the A/E for inclusion.

b) Where the contractor proposes to use different size equipment, feeders, feeder materials, circuit breakers, fuses or significant difference in routing of feeders or branches than shown in the construction documents, the contractor shall include the necessary MEP design fees that are required for modifying or creating construction drawings necessary either for construction or submission to the authority having jurisdiction and required for additional review. Design work and drawing changes will only commence once the design fee is established and a signed agreement returned to the A/E for inclusion.

16A-13 CAD FILE REQUESTS:

a) CAD files (only where created as part of the project design) are the property of the D/E and are only available upon documented written request. Prior to receiving any CAD files or models, the contractor must sign a Third-Party User Agreement and Drawing Request Form which must be forwarded to the D/E office prior to any CAD files being released. This form is available from the D/E upon request.

16A-14 CUTTING AND PATCHING:

a) Contractor shall do cutting and patching of building materials required for installation of work herein specified. Cut no structural members without Architect’s approval and in a manner approved by him.

b) Patching shall be by mechanics of particular trade involved and shall meet approval of Architect.

c) Drilling and cutting of openings through building materials requires Architect’s review and approval. Make openings in concrete with concrete hole saw or concrete drill. Do not use star drill or air hammer for this work.

16A-15 MUTILATION:

a) Mutilation of building finishes, caused by installation of electrical equipment, fixtures, outlets, and other electrical devices shall be repaired at E/C’s expense to approval of Architect.

16A-16 EXCAVATION AND BACKFILL:

a) Perform necessary excavating to receive work. Provide necessary sheathing, shoring, cribbing, tarpaulins, etc., as required and remove same at completion of work. Perform excavation in accordance with appropriate section of these specifications, and in compliance with OSHA Safety Standards.

b) Excavate trenches of sufficient width to allow ample working space, and no deeper than necessary for installation work.

c) Conduct excavations so no walls or footings are disturbed or injured. Backfill excavations made under or adjacent to footings with selected earth or sand and tamp to compaction required by A/E. Mechanically tamp backfill under concrete and paving in 6-inch layers to 95 percent standard density.
d) Backfill trenches and excavations to required heights with allowance made for settlement. Tamp fill material thoroughly and moisten as required for specified compaction density. Dispose of excess earth, rubble, and debris as directed by Architect.

e) When available, refer to test-hole information on Architectural drawings or specifications for types of soil to be encountered in excavation. Where rock is indicated, list unit cost for rock excavation in base bid.

16A-17 SETTING, ADJUSTMENT, AND EQUIPMENT SUPPORTS:

a) Work shall include mounting, alignment, and adjustment of systems and equipment. Set equipment level on adequate foundations and provide proper anchor bolts and isolation as shown, specified. Level, shim, and grout equipment bases as recommended by E/M. Mount motors, align and adjust drive shafts and belts according to E/M’s instructions. Equipment failures resulting from improper installation or field alignment shall be repaired or replaced by E/C at no cost to Owner.

b) Provide concrete bases for all floor and slab mounted equipment. Refer to drawings for require base type and size. Provide 3.5-inch high base where base is not shown on drawings.

c) Provide each piece of equipment or apparatus suspended from ceiling or mounted above floor level with suitable structural support, platform, or carrier in accordance with best recognized practice. E/C shall arrange for attachment to building structure, unless otherwise indicated on drawings or specified. Provide hangers with vibration eliminators. Contractor shall verify with structural engineer that structural members of buildings are adequate to support equipment. Submit details of hangers, platforms, and supports together with total weights of mounted equipment to structural engineer and A/E for review before proceeding with fabrication or installation.

d) Supports and/or support wires for electrical equipment, raceways, light fixtures, etc. shall be designated (painting is acceptable) separately from supports and/or support wires for other building systems. All supports and/or support wires shall be designated the same throughout the project.

16A-18 START-UP, CHANGE-OVER, TRAINING AND OPERATIONAL CHECKS:

a) E/C shall perform initial start-up of systems and equipment. Personnel qualified to start-up and service this equipment, including E/M’s technicians, when specified, and Owner’s operating personnel shall be present during these operations.

b) E/C shall be responsible for training Owner’s operating personnel to operate and maintain systems and equipment installed. Keep a record of training provided to Owner’s personnel listing the date, subject covered, instructor’s name, names of Owner’s personnel attending, and the total hours given each individual.

c) E/C shall report in person to Owner’s operating engineer at end of first month of operation and thereafter at end of sixth and 12th months after date of substantial completion of building to check operation of equipment that was installed under contract. Contractor shall answer operating personnel’s questions regarding system operation and shall ascertain that systems are operating normally and are being properly maintained by Owner. If E/C finds that systems are not being operated and maintained as designed, he shall inform the building engineer/Owner and A/E in writing.

d) After each inspection, E/C shall submit written report to A/E indicating condition of equipment and including any recommended changes in operation of system or other information which will be helpful to Owner.

16A-19 MAINTENANCE OF SYSTEMS:

a) E/C shall be responsible for operation, maintenance, and lubrication of equipment installed under his contract.
16A-20  PROTECTION AND CLEANING OF SYSTEMS AND EQUIPMENT:

a) It shall be E/C’s responsibility to protect and prevent damage to all electrical materials and equipment stored and/or installed under this contract. All work, materials, and equipment shall be adequately protected by any and all means necessary to prevent damage by weather, flooding, condensation, construction debris, fire, and construction equipment and vehicles.

b) Equipment not rated for outdoor use shall be protected from moisture damage before and during construction. Covering equipment with a tarp on site is not considered a means of providing protection from moisture. Any equipment not rated for outdoor use exposed to moisture for any duration shall be replaced with new equipment at the contractor’s expense.

c) Where job conditions, or work of other contractors produce the potential for damage to electrical systems and equipment, E/C shall immediately notify the G/C so that corrective action can be taken.

d) E/C shall take extra precautions to protect electrical equipment containing solid state electronics, open relays, and contacts from damage by water, dust, dirt, construction debris, and the formation of condensate. All equipment so damaged shall be replaced by E/C with new equipment at no cost to Owner.

e) E/C shall periodically inspect and clean all systems and equipment to ensure all systems and equipment remain in like new condition during construction. All cleaning shall be done in accordance with E/M’s recommendation where available and applicable.

f) Before request for final inspection, all systems and equipment shall be properly cleaned, vacuumed, polished, painted, etc., as required to return equipment to like new appearance.

g) All equipment requiring painting or touch-up shall be properly prepared and painted in accordance with this specification.

h) E/C shall keep a written record listing systems and equipment cleaned. Where special procedures or chemicals were used or where partial or complete disassembly of factory assembled equipment was necessary, E/C shall list special procedures and/or disassembly required and equipment components affected. Prior to final inspection, E/C shall submit two (2) copies of cleaning record to A/E for their records.

16A-21  PAINTING OF MATERIALS AND EQUIPMENT:

a) Equipment and materials exposed to interior dry environment shall have a minimum of one (1) primer and one (1) finish coat. Equipment and materials mounted in exterior location shall have a minimum of one (1) primer and two (2) coat colors in finish areas shall be selected by A/E.

b) After installation, damage to painted surfaces shall be properly prepared and primed with primers equal to factory materials. Finish coating shall be same color and type as factory finish.

c) Where extensive refinishing of factory applied finishes is required, equipment shall be completely repainted. A/E will make final determination of extent of refinishing required.

16A-22  RECORDING AND REPORTING TESTS AND DATA:

a) Record nameplate horsepower, amperes, volts, phase service factor, and other necessary data on motors and other electrical equipment furnished and/or connected under this contract.

b) Record motor starter catalog number, size, rating, and/or catalog number of thermal-overload units installed in all motor starters furnished and/or connected under this contract. See motor starter specification instructions for proper sizing of thermal-overload units.
c) Record amperes-per-phase at normal or near-normal loading of each item of equipment furnished and/or connected.

d) Record current readings of each feeder conductor after energized and normally loaded, and again after balancing of feeder loads as required by current readings.

e) Record voltage and amperes-per-phase readings taken at service entrance equipment after completion of project with building operating at normal electrical load. This reading shall be taken continuously for a 24-hour period and recorded on permanent tape and submitted to A/E.

f) Record voltage and amperes at transformer secondary and primary stations, at normal loading. Record transformer percentage “taps” finally selected. Transformers shall be connected to produce voltage at building service entrance equipment as follows:

<table>
<thead>
<tr>
<th>Nominal System Voltage</th>
<th>Service Entrance Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>230</td>
<td>240</td>
</tr>
</tbody>
</table>

g) Submit at least two (2) copies of data noted above to A/E for review prior to final inspection.

h) Keep a record of all deviations made from routes, locations, circuiting, etc., shown on contract drawings. Prior to final inspection, submit one (1) new set of project drawings with all deviations and changes clearly indicated.

16A-23 IDENTIFICATION OF WIRING AND EQUIPMENT:

a) Provide identification and warning signs to wiring and equipment as listed in schedule. Signs and tags shall be as follows:

   TYPE 1  Laminated phenolic plastic with black Gothic-condensed lettering by Seaton or Wilco. Signs shall be weatherproof and securely attached to equipment.

   TYPE 2  Self-sticking 0.5-inch-wide flexible nylon tape with high gloss surface and typed smear proof, chemical/solvent resistant lettering by Brady or Dymo.

   TYPE 3  Self-sticking polyester sign with wording and size conforming to ANSI Z35.1 – 1964 and OSHA 19.0.144iii (2) specifications, by Brady or as approved.

   TYPE 4  Self-sticking flexible vinyl with oil resistant adhesive for minus 20 deg F to 300 deg F temperatures by Brady or as approved.

b) Provide distribution panelboards with Type 1 signs 2 inches by 8 inches indicating panel designation, electrical characteristics and source of power. Source of power indication shall indicate source panel designation and switch or breaker number. Provide branch devices with Type 1 sign 1 inch by 4 inches indicating load served.

c) Provide lighting and power panelboards with Type 1 sign 1.25 inches by 6 inches indicating panel designation, electrical characteristics, and source of power. Source of power indication shall indicate source panel designation and switch or breaker number.

d) Provide disconnect switches, time switches, lighting contactors, motor starters, and controllers with Type 1 sign 1.25 inches by 6 inches indicating equipment served, electrical characteristics, and source of power. Source of power indication shall indicate source panel designation and switch or breaker number.

e) Provide electrical equipment and accessible wiring enclosures (junction boxes included) operating at voltage above 240 volts with Type 3 Brady No. AE-461 25 warning sign and Brady Style B, 1.125 inches by 4.5 inches voltage marker applied to front door or cover of device or enclosure. Provide
large equipment such as transformers and main distribution equipment with Type 3 sign Brady No. AE-46639.

f) Provide feeders and branch circuit home runs with Type 4 wire marker indicating circuit number and power source. Provide feeders phase identification letter at each terminal point in addition to its circuit number.

g) Provide Type 2 tape at feeder terminal lugs to switchboards and panelboards. Tape shall indicate conduit size, conductor type, and AWG size. Tape shall be located to be easily read with conductors installed.

h) All electrical equipment, such as switchboards, panelboards, distribution panelboards, load centers, industrial control panels, meter socket enclosures, C/T cabinets and motor control centers shall be provided with a Type 1 sign warning persons of potential electric arc fault hazards. The sign shall be located so as to be clearly visible to qualified persons before examination, adjustment, servicing or maintenance of the equipment. Sign shall include at a minimum the orange ‘WARNING’ label with exclamation point symbol, and the wording “ARC FAULT HAZARD. APPROPRIATE PPE REQUIRED. FAILURE TO COMPLY CAN RESULT IN DEATH OR INJURY. REFER TO NFPA 70E.”

i) All electrical equipment, such as switchboards, panelboards, distribution panelboards, load centers, industrial control panels, meter socket enclosures, C/T cabinets, motor control centers and disconnect switches shall be provided with a Type 1 sign indicating the maximum available fault current. The sign shall include the date at which the calculation was performed. This sign shall be separate from other required signs so that it is more easily replaced in the future when changes are made.

16A-24 SLEEVES:

a) Provide proper type and size sleeves for electrical ducts, busses, conduits, etc., passing through building construction. Where sleeves are installed by others, supervise installation to ensure proper sleeve location. Unless indicated or approved, install no sleeves in structural members. Sleeves shall be installed in concrete or masonry walls or floors and where otherwise noted.

b) Each sleeve shall be continuous through wall floor or roof and shall be cut flush on each side except where indicated otherwise. Sleeves shall not be installed in structural member except where indicated or approved. Sleeves shall be required through floors subject to flooding such as toilet rooms, equipment rooms, and kitchens. The contractor shall have the option of:

1. [Providing a PVC sleeve with integral flanges extending 1-inch above finished floor. Sleeve shall be cast in concrete when floor is poured. Annular space between sleeve and pipe shall be filled with Kawool.]

   or

2. [Provide core-drilled opening in concrete with Thunderline Link-Seal or Calpico Sealing Linx between piping and opening.]

c) Sleeves passing through floors and exterior walls with waterproof membranes shall be core-drilled (floors only) and sealed with Thunderline Link-Seal or Calpico Sealing Linx.

d) Where electrical ducts, busses, conduits, wiring, etc., pass through fire walls, floors, and smoke partitions, seal annular space between sleeve and item passing through with Kaowool Fire Master Bulk Packing. Packing thickness shall be sized per manufacturer’s recommendation for maintaining the integrity of the fire wall/floor or smoke partition. Fire protection system shall be rated per ASTM E 119. Equivalents to Kaowool are 3M, Flame stop, or Flame Safe.

e) Where piping passes through walls serving as supply or exhaust air plenums or chases, seal annular space between pipe and sleeve airtight with Thunderline Link-Seal or Calpico Sealing Linx.
16A-25 RECORD DOCUMENTS:

a) Record Drawings: Maintain a reproducible set of contract drawings and shop drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing “field” condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at corresponding location on working drawings. Mark with red erasable red pencil and, where feasible, use other colors to distinguish between variations in separate categories of work. Mark-up new information, which is recognized to be of importance to Owner, but was for some reason not shown on either contract drawings or shop drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on cover of each sheet.

b) Record Specifications: Maintain one (1) copy of specifications, including addenda, change orders, and similar modifications issued in print form during construction and mark-up variations (of substance) in actual work in comparison with text of specifications and modifications, as issued. Give particular attention to substitutions, selection option, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable. Upon completion of mark-up, submit to A/E for Owner’s records.

c) The Contractor shall provide a full set of photographs showing the entire underground equipment. The photographs shall be taken prior to any concrete being poured. The underground equipment shall consist of, but not be limited to, the following:

1. Piping
2. Conduits
3. Ductwork

d) The Contractor shall provide the photographs in an 8.5-inch by 11-inch format for record keeping purposes with the maintenance manuals. The photos shall all be digital and a disk or CD shall be provided to the Owner as a permanent record.

e) As-built documents shall be submitted for approval prior to final payment. Copies of “in-progress” as-built drawings shall be submitted at each pay request.

END OF SECTION 16A
DIVISION 16 – ELECTRICAL

SECTION 16B – GENERAL POWER AND LIGHTING

16B-1  CIRCUITING:

a) Follow circuiting shown on drawings for lighting, power, and equipment connections.

b) Shared neutrals are not allowed for any circuits fed through a dimming system.

16B-2  CONDUIT APPLICATION:

a) All wiring shall be in steel conduit unless otherwise noted in this section.

b) Provide EMT conduit for the following applications:

1. All panelboard feeders above grade.
2. All branch circuits.

c) Non-metallic conduit shall be allowed only for the following applications:

1. Electrical service feeders below grade. Transition to steel conduit shall be made prior to coming up from below grade.
2. Branch circuits below grade. Transition to steel conduit shall be made prior to coming up from inside the concrete.
3. Underground telephone service.
4. Underground cable television service.

d) MC Cable shall be allowed for the following applications only (all homeruns shall be in EMT conduit):

1. Light fixture whips:
   A. For lay-in type fixtures only - maximum of 6’.
2. Concealed in above grade walls from first served device to downstream devices.

e) Where MC cable is noted above as allowed, it shall be installed as follows:

1. MC cable shall be allowed for light fixture whips. EMT is required from between fixtures.

f) Minimum conduit size shall be 0.75”

g) All low voltage wiring systems not listed in the following paragraph shall be provided with conduit for all wiring, this includes temperature controls, lighting controls and fire alarm systems.

h) All low voltage wiring systems (including, but not limited to security, access control, telephone/data, television, audio/video, etc.) shall be provided with junction boxes and conduit up to above accessible lay-in ceilings (unless noted otherwise on plan), where open, plenum-rated wiring is allowed only above lay-in and/or sheetrock ceilings where wiring will be concealed from view. Where there is no ceiling (exposed structure), conduits shall be provided to conceal all wiring and all conduits shall be concealed in the building construction – exposed conduits are not allowed anywhere on the project unless noted on plan). Security, access control, telephone/data, television, audio/video, etc. wiring shall be bundled together by system and supported from the structure at regular intervals with J-
hooks and additionally as required by code and the manufacturer where routed as open wiring above ceilings. Wiring shall not be routed unsupported or with straps.

**16B-3 STEEL CONDUIT:**

a) Rigid Conduit: Provide steel conduit meeting current ANSI C80.1 with hot-dipped galvanized and clear lacquer finish.

b) Electrical Metallic Tubing (EMT): Provide thinwall conduit meeting current ANSI C80.3 with electro-galvanized and clear lacquer finish.

c) Rigid Conduit and EMT Fittings: Provide Appleton Form 35 non-thread malleable iron unilets.

d) Rigid Conduit Connectors and Couplings: Provide Appleton steel NO-THREAD-TYPE, rain and concrete tight.

e) EMT Connectors and Couplings: Provide Regal COMPRESSION EMT TYPE, concrete tight.

f) Liquid-Tight Flexible Conduit Fittings: Appleton “STB” series insulated connectors.

g) Provide insulated throat fittings when Type THHN/THWN conductors are installed.

h) Short runs of flexible galvanized steel conduit may be used where permitted by code. Lengths greater than 6 feet require review by Engineer.

i) Make conduit connections to motors and equipment mounted on resilient mounts or vibration isolators with Type U.A. liquid-tight flexible conduit manufactured by Anaconda, or “ Liquatite” by Electric-Flex Company.

j) Where conduits cross building expansion joints, provide O-Z expansion fitting Type “AX,” “TE,” “EX,” or “EXE” as required.

k) Conduit manufacturer shall be Republic Conduit, Allied Tube, Wheatland Conduit, and Western Tube and Conduit or approved equivalent.

l) **Set screw type conduit fittings will not be allowed.**

**16B-4 PLASTIC CONDUIT:**

a) The following are general requirements for installation of plastic conduit which apply only where such plastic conduit is specifically allowed by Section 16B-2.

b) Normal duty applications in concrete slabs or underground without concrete encasement. Conduit shall be Carlon Plus 40 or Carlon Plus 80, rated for use with 90 deg C conductors, UL Listed or approved equal. Material shall comply to NEMA TC-2 (conduit), TC-3 (fittings) and UL 651 (conduit) and 514b (fittings). Conduit shall be listed UL 651 for underground and exposed use.

c) All conduit and fittings shall be solvent cemented in applications in accordance with instructions from the manufacturer.

d) Normal duty exterior underground applications direct burial: Provide semi-rigid polyvinyl chloride (PVC) Type DB plastic duct meeting current NEMA TC-6 and Western Underground Committee Specifications.

e) Normal exterior underground applications encased burial: Provide semi-rigid polyvinyl chloride (PVC) Type A plastic conduit meeting current NEMA and Western Underground Committee Specifications.
f) Provide matching plastic conduit fittings by E/M. Fittings shall meet the same standards and specifications as the conduit on which it is installed.

g) Joining and bending of conduit and installation of fittings shall be done only by methods recommended by E/M.

h) Provide conduit support spacing as recommended by E/M for the highest ambient temperature expected.

i) Provide interlocking conduit spacers by E/M or multiple runs of underground conduits installed in the same trench.

j) Ends of feeder conduit terminating at transformers, switchgear, manholes, etc., shall be terminated with bell ends to protect conductor insulation.

k) Install no plastic conduit in areas where ambient temperature may exceed 150 deg F under normal conditions nor on heat producing equipment such as boilers, incinerators, etc. Install no plastic conduit in a return air or supply air plenum for the HVAC systems.

l) Provide expansion couplings on conduits located in areas where ambient temperatures are constantly changing and on long runs regardless of ambient temperatures. Determine amount of conduit expansion and contraction from E/M’s published charts or tables.

m) All below grade PVC conduit shall be provided with tracer wire.

n) Plastic conduit and fittings shall be by Carlon Products Division of Continental Oil Company.

o) Plastic conduit shall not be used above grade for any purpose. All transitions from PVC to steel shall be made below grade.

16B-5 CONDUIT INSTALLATION:

a) In general conceal conduit within walls, floors, roof construction, or furred spaces. Expose only feeders and short connections to equipment in equipment rooms unless noted otherwise. Install exposed conduit parallel or at right angles to building lines.

b) Install conduit to requirements of structure, other work on project and clear of openings, depressions, pipes, ducts, reinforcing steel, etc. Install conduit in concrete forms so that strength of structure will not be affected.

c) Align conduit terminations at panelboard, switchboards, motor control equipment, junction boxes, etc., and install true and plumb. Provide supports or templates to hold conduit alignment during rough-in stage of work.

d) Install conduit continuous between outlet boxes, cabinets, and equipment. Make bends smooth and even without flattening or flaking conduits. Radius of bends shall not be shorter than radius listed in NEC chapter 9, table 2. Long radius elbows may be used where necessary.

e) Ream and clean conduit before installation, and plug or cover openings and boxes to keep conduit clean during construction.

f) Install no conduits or other raceways sized smaller than permitted in applicable NEC tables. Where conduit sizes shown on drawings are smaller than permitted by code, E/C shall include cost for proper size conduit in his base bid. In no case reduce conduit sizes indicated on drawings or specified without written approval of A/E. Fasten conduit securely in place with approved straps, hangers, and steel supports. Provide O-Z cable support to support conductors in vertical raceways as required by NEC Table 300-19(a). Where special hangers are required, submit hanger details to A/E for review before installation.
g) Where conduits cross expansion joints in building construction, the conduit system shall be provided with a means of allowing expansion/contraction in the conduit system.

h) Where a conduit or conduits enter a building from underground or from the exterior, they shall be sealed in accordance with the NEC section 300.5(G). Spare or unused conduits shall also be sealed. Sealants shall be identified for use with the cable insulation, shield or other components. Conduits (or sleeves) which will be subjected to different temperatures (such as where passing from interior to exterior, or at coolers/freezers, etc.), the conduit (or sleeve) shall be filled with an approved material to prevent the circulation of warm air to a colder section.

16B-6 INSERTS AND HANGERS:

a) Support vertical and horizontal conduit runs at intervals not greater than 10 feet, within 3 feet of any bend and at every outlet or junction box, where plastic conduit is used follow E/M’s recommended hanger spacing.

b) Insert multiple runs of conduits as follows:
   1. Where a number of conduits are to be run exposed and parallel, group and support trapeze hangers.
   2. Fasten hanger rods to structural steel members with suitable beam clamps and to concrete structures with inserts set flush with surface. Install concrete inserts with reinforced rod through opening provided in inserts.
   3. Inserts shall be Grinnel Figure 279, 281, 282, or 285 or equivalent as required by load and concrete thickness.
   4. Provide beam clamps suitable for structural members and conditions.
   5. Provide 0.375-inch minimum diameter steel hanger rods galvanized or cadmium-plated finish.
   6. Trapeze hangers shall be Kindorf Series 90 channel with fittings and accessories as required.
   7. Attach each conduit to trapeze hanger with Steel City No. C01 05 clamps for rigid conduit and Steel City No. C-1 06 clamps for EMT.

c) Install clamps for single conduit runs as follows:
   1. Support individual runs by approved pipe straps, secured by approved pipe straps, secured by toggle bolts on hollow masonry; expansion shields and machine screws or standard preset inserts on concrete or solid masonry; machine screws or bolts on metal surfaces; and wood screws on wood construction. Use of perforated strap not permitted.
   2. Install exposed conduits in damp locations with clamp backs under each conduit clamp to prevent accumulation of moisture around conduits.
   3. Individual conduits suspended from ceiling shall be supported by Steel City No. C-1 49 hangers.

d) Provide inserts, hangers, and accessories with finish as follows:
   1. Galvanized: Concrete inserts and pipe straps.
   2. Galvanized or Cadmium Plated: Steel bolts, nuts, washers, and screws.
e) Equivalent hanger and support systems by Binkley, Fee and Mason, Kin-Line, or Unistrut.

a) Supports and/or support wires for electrical equipment, raceways, light fixtures, etc. shall be designated (painting is acceptable) separately from supports and/or support wires for other building systems. All supports and/or support wires shall be designated the same throughout the project.

16B-7 BUSHINGS AND LOCKNUTS:

a) Enter outlet boxes squarely and securely clamp conduit to outlet box with bushing on inside and locknut on outside. Provide Steel City BG series or equivalent threaded die-cast zinc insulated throat grounding bushings.

b) Terminate metallic conduits at switchboards, panelboards, control cabinet, etc., with Steel City BG series or equivalent malleable iron grounding type insulation bushings. Ground bushings to equipment grounding bus.

16B-8 OUTLET BOXES:

a) Provide electrical service outlets, including plug receptacles, lamp receptacles, lighting fixtures, and switches with Steel City, Raco, or equivalent 4-inch code gauge steel knockout boxes galvanized or sherardized of required depth for service or device.

b) Provide code gauge galvanized steel raised covers on outlet boxes installed in plaster finish. Set to plaster grounds with outside edge of cover flush with plaster finish.

c) Provide 0.375-inch or larger fixture stud in each outlet box scheduled to receive lighting fixture. Select covers with proper opening for device installed in outlet box.

d) Use of utility or “Handy” boxes acceptable only where single gang flush outlet box in masonry is “dead-end” with only one conduit entering box from end or back.

e) Use no sectional outlet boxes.

f) Provide Appleton FS or FD unilets for surface mounted exterior work. Provide complete with proper device cover and gasket. Provide blank cover and gasket when used as junction box.

g) Install boxes to maintain all fire ratings, as required by the building code and NEC. At all boxes installed in fire walls throughout the project, provide fire-rated sealing assembly (refer to the other specification sections for additional locations – refer to the architectural specifications for specification of all fire rated penetration sealing materials). Putty pads and/or other fire-rated sealing assemblies, where provided, shall fully seal all boxes and conduit entries (including at the penetration into the top of the wall) and shall be installed per the manufacturer’s instructions (including minimum/maximum ambient temperatures at time of install and after installation). Submit fire penetration materials and information with the shop drawings to the architect. Refer to the other specification sections for additional requirements. Putty pads and/or fire-rated sealing assemblies shall have a minimum STC rating per the architectural specifications.

16B-9 LOCATION OF OUTLET BOXES:

a) Locate outlet boxes generally from column centers and finished wall lines. Install ceiling outlet boxes at suspended ceiling elevations.

b) Accurately locate lighting fixtures and appliance outlet boxes mounted in concrete or in plaster finish on concrete. Install outlet boxes in forms to dimensions taken from bench marks, columns, walls, or floors. Rough-in lighting fixtures and appliance outlet boxes to general locations before installation of walls and furring, and reset to exact dimensions as walls and furring are constructed. Set outlet boxes true to horizontal and vertical finish lines of building.

GENERAL POWER AND LIGHTING 16B p5
c) Install outlet boxes accessible. Provide outlet boxes above piping or ductwork with extension stems or offsets as required to clear piping and ductwork.

d) Install centerline of light switch or lighting control outlet boxes at 48 inches above floor (to the top) unless otherwise called for or required by Wainscot, counter, moulding, etc – coordinate with millwork contractor and G/C prior to any rough-in. All electrical light switches shall be located as close to door frame as possible. Under no circumstances should switches be located more than 12 inches from the edge of door frames.

e) Install centerline of receptacle outlet boxes 18 inches above floor unless otherwise called for on drawings.

f) All thermostats, temperature sensors and HVAC controls shall be installed at 48" above finish floor to the top of the thermostat or sensor, on the room side of light switches where shown in the same location. None of the controls shall be higher than 48" above finish floor to the operating or visible parts.

g) Maintain minimum clearances for all boxes for proper operation of equipment (including, but not limited to, switches, fire alarm devices, temperature controls, lighting controls, receptacles, television outlets, telephone/data outlets, volume controls, A/V controls, screen switches, etc.) after they are installed – coordinate installation requirements with M/C, temperature controls contractor, owner’s A/V contractor, lighting control manufacturer and owner’s telephone/data and television system contractors prior to any rough-in to allow adequate space for all equipment. Where conflicts occur with other building components (or with light switches below these devices), notify A/E of conflict and get approval to modify box location, height or rotation prior to any rough-in. It shall be the contractor’s responsibility to relocate any boxes, conduits, wiring, etc. installed prior to coordination with any other building system.

h) If a wiring device (including, but not limited to, switches, fire alarm devices, temperature controls, lighting controls, receptacles, television outlets, telephone/data outlets, volume controls, A/V controls, screen switches, etc.) is shown to be installed in or on a column, it shall be centered on the column unless noted otherwise.

i) Locate associated data, telephone and television outlets at the same height as adjacent, associated receptacles, within 6 inches of the associated receptacles, where shown side-by-side on the plans and not noted otherwise.

j) Where wall-mounted telephone outlets are shown on the drawings in the same location as light switches, the telephone outlet shall be installed to the room side of the light switches at 48" above finish floor to the top of the telephone controls (no part of the telephone controls shall be higher than 48" above finish floor. Coordinate phone requirements with the owner prior to any rough-in). Do not locate phone outlet above the switches – locate 8" from the end of the light switches to allow clearance of the phone.

k) Where wall-mounted volume controls, A/V controls, and/or screen switches are shown on the drawings in the same location as light switches, these controls shall be installed on the room side of light switches at 48" to the top of the box.

l) Contractor shall be responsible for coordination of all box locations with millwork, wall treatments (mats, chair rails, paneling, special systems, etc…), finishes and architectural elements to maintain full accessibility per NEC and to facilitate installation and operation of all systems. Where conflicts occur with other building components, notify A/E of conflict and get approval to modify box location or rotation prior to any rough-in. It shall be the contractor’s responsibility to relocate any boxes, conduits, wiring, etc. installed prior to coordination with any other building system.

m) Install clock and other outlet boxes at elevations indicated on drawings or as directed by A/E. Center bracket lights over mirrors with 2-inch clearance above the mirror to the bottom of the installed fixture.
n) Provide Alwalt, Keystone, Universal, or equivalent code gauge pull boxes, wireways, and gutters indicated or required for installation, sized to conform to NEC rules. Provide complete with necessary fittings, interconnecting nipples, insulating bushings, conductor supports, covers, gaskets, partitions, etc., as required.

o) Special items may be fabricated locally to same general design and specifications as those listed in specified manufacturer’s catalogs. Provide free of burrs, sharp edges, unreamed holes, sharp pointed screws or bolts, and finished with one coat of suitable enamel inside and out, prior to mounting.

p) Where devices are installed in masonry, coordinate with A/E prior to any rough-in to allow adjustments for masonry joint locations.

16B-10 PULL BOXES, WIREWAYS, AND GUTTERS:

a) Provide Alwalt, Keystone, Universal, or equivalent code gauge pull boxes, wireways, and gutters indicated or required for installation, sized to conform with NEC rules. Provide complete with necessary fittings, interconnecting nipples, insulating bushings, conductor supports, covers, gaskets, partitions, etc., as required.

b) Special items may be fabricated locally to same general design and specifications as those listed in specified manufacturer’s catalogs. Provide free of burrs, sharp edges, undreamed holes, sharp pointed screws or bolts, and finished with one coat of suitable enamel inside and out, prior to mounting.

c) Provide sectional covers for easy removal.

16B-11 CONDUCTORS:

a) Unless noted otherwise conductors referred to are wires and cable. Provide code grade soft annealed copper conductors with specified insulation type in proper colors to conform to color coding specified. Provide conductors No. 8 gauge and larger stranded and conductors No. 10 gauge and smaller may be solid or stranded.

b) Use no conductors smaller than No. 12 gauge unless specifically called for or approved by D/E. Size wire for 120 volt branch circuits for 3 percent maximum voltage drop. Size feeder circuits for 2 percent maximum voltage drop. Combined voltage drop of feeders and branch circuits shall not exceed 5 percent maximum.

c) Provide conductors for listed applications as follows:

1. Lighting and Receptacle Circuits: Type THHN, 600 volt, 90 deg C (194 deg F) thermoplastic insulated building conductor.

2. Power Circuits and Feeders: Type THHN, 600 volt, 90 deg C (194 deg F) thermoplastic insulated building conductor.

3. Low Voltage and Line Voltage Conductors Sizes No. 16 and No. 18 AWG: Type TFFN, 600 volt, 90 deg C (194 deg F) thermoplastic insulated building conductor.

4. Underground Circuits and Feeders: Type THHN/TWHN, 600 volt, 75 deg C (167 deg F) wet rating and 90 deg C (194 deg F) dry rated thermosetting filled insulating cable.

Alcan Stabiloy compact aluminum alloy AA8000 conductors may be used in lieu of copper conductors for feeders of the size No. 1/0 AWG (copper) and larger, provided the conductors substituted will have the same current capacity (or greater) as the copper conductors specified with exceptions as follows. Aluminum conductors will not be permitted and copper conductors are required for all feeders from the main distribution panelboard/switchboard to the final connection at the equipment for all
elevators, fire pumps, and from the main distribution panelboard/switchboard to all rooftop units, HVAC equipment, motors, elevators and electric heaters. All terminations and/or splices shall be made with approved high compression terminations – mechanical terminations will be allowed, but must be submitted for specific approval. Aluminum alloy conductors are only allowed where approved by the authority having jurisdiction – the contractor shall verify with the local authority having jurisdiction prior to submitting bids. Adds will not be allowed after the fact where a change is required. No aluminum conductors smaller than No. 1/0 shall be allowed for any purpose. Aluminum conductors shall not be allowed on any emergency or standby feeders or any circuits fed from panels that are also fed by the emergency/standby generator.

e) Provide conductors by Encore Wire and Cable, Southwire, Senator Wire and Cable, and Cerro Wire or equivalent.

16B-12 CONDUCTOR INSTALLATION:

a) Run conductors in conduit continuous between outlets and junction boxes with no splices or taps pulled into conduits.

b) Neatly route, tie, and support conductors terminating at switchboards, motor control centers, panelboards, sound equipment, etc., with Thomas & Betts Ty-Rap cable ties and clamps or equivalent by Electrovert or Panduit.

c) Make circuit conductor splices with Buchanan B- Cap nylon insulated connectors or equivalent by Ideal or 3M.

d) Make fixture and device taps with Scotchlock self-stripping electrical tap connectors.

e) Terminate solid conductors at equipment terminal strips and other similar terminal points with insulated solderless terminal connectors. Terminate all stranded conductor terminal points with insulated solderless terminal connectors. Provide Thomas & Betts Sa-Kon insulated terminals and connectors or equivalent by API/AMP Blackburn, Buchanan, or Scotchlock.

f) Where a total of six (6) or more control and feeder conductors terminate in a multiple device panel or enclosure that has no built-in terminal blocks, provide mounting channel and see-through covers. Equivalent terminal blocks by General Electric, Square D, or approved equal.

g) Wrap conductor taps and connections requiring additional insulation with a minimum of three (3) overlapped layers of 3M Scotch vinyl plastic electrical tape No. 88 or equivalent.

16B-13 CONDUCTOR COLOR CODING:

a) Provide continuous color coding for feeder, branch, and control circuits. Insulation or identification tape color shall be same color for like circuits throughout. Where specified insulation colors are not available in larger wire sizes, color code conductor at all accessible locations with Scotch 35 all-weather color code tape.

b) Identify the same phase conductor with same color throughout.

c) Provide conductors with color coding indicated. Where more than one standard voltage system is installed, provide same colored conductors with indicated tape or stripe to indicate system voltage.

<table>
<thead>
<tr>
<th>SYSTEM VOLTAGE</th>
<th>CIRCUIT</th>
<th>INSULATION COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>120/240</td>
<td>Neutral</td>
<td>White</td>
</tr>
<tr>
<td>120/240</td>
<td>Phase A</td>
<td>Black</td>
</tr>
<tr>
<td>120/240</td>
<td>Phase B</td>
<td>Blue</td>
</tr>
<tr>
<td>120/240</td>
<td>Phase C</td>
<td>Red</td>
</tr>
<tr>
<td>120/240</td>
<td>Phase A Switch</td>
<td>Brown</td>
</tr>
</tbody>
</table>
16B-14  FUSES:

a) Provide fuses of same manufacturer and characteristics as scheduled to insure selective coordination of power system. Fuses shall be Bussmann or equivalent by Gould Shawmut or Brush.

b) Install fuses only after installation is complete and final tests and inspections have been made. Label fuses, switches, and other fused devices with warning labels affixed in prominent location indicating type and size of fuse installed and fuse manufacturer’s catalog number. Labels are supplied in fuse cartons.

c) Furnish Owner with spare fuses of each size and type installed on job as follows:

<table>
<thead>
<tr>
<th>Current Range</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>601 Amps or larger</td>
<td>Three (3) of each size and type.</td>
</tr>
<tr>
<td>600 Amps or less</td>
<td>10% with minimum of three (3) of each size and type.</td>
</tr>
</tbody>
</table>

d) Obtain receipt from Owner’s representative showing date, quantity, and size of spare fuses delivered to Owner. Submit two (2) copies of receipt to A/E and bind one (1) copy in Owner’s shop drawing manual.

e) Provide fuses with casings to match fuse holder dimensions. Fuse reducers shall not be used without prior approval of D/E.

f) Fuse shop drawings shall contain a schedule listing fuse type and size to be provided in each switch or fuse block. Also, provide a list indicating type, size, and quantity of spare fuses to be provided to Owner.

g) Fuse types shown in equipment schedules are Bussmann type designations unless otherwise indicated.

16B-15  SAFETY SWITCHES:

a) Provide heavy duty and general duty horsepower rated safety switches rated in accordance with NEMA enclosed Switch Standard KS-1 – 1975 and UL 98 and as scheduled.

b) Enclosure shall be NEMA type required by switch location and environment. Enclosure door shall have latch with means for padlocking and cover interlock with defeater to prevent opening door when switch is energized or closing switch with door open. Switch shall have an embossed nameplate permanently attached to door front with switch rating, short circuit interrupting capacity, and application information.

c) Line terminals shall be permanently marked and shielded. Contacts shall be tin plated, equipped with arc chutes, and have moving contacts visible in off-position with door open. Wiring terminals shall be pressure type suitable for copper or aluminum wire. Switching mechanism shall be quick-make, quick-break, spring driven, anti-tease mechanism, and be integral part of box. All current carrying parts shall be plated.

d) Fuse holders for 1 to 600 amperes shall be high pressure type for use with Class R current limiting fuses. Fuse holders shall be completely accessible from front of switch.

e) Provide switches by Eaton/Cutler-Hammer, General Electric, ITE/Siemens, or Square D.
f) See schedule.

**16B-16 WALL SWITCHES:**

a) Provide Leviton NEMA WD-1 – 1974 switches with compound handles. Install groups of switches under one (1) coverplate.

b) Provide switches in colors as selection by A/E.

c) Switches controlling loads of 1800 watts or less shall be as follows unless specified otherwise:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>CATALOG #</th>
<th>AMP</th>
<th>VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Pole</td>
<td>LE 1221-2</td>
<td>20</td>
<td>120/277</td>
</tr>
<tr>
<td>Three Way</td>
<td>LE 1223-2</td>
<td>20</td>
<td>120/277</td>
</tr>
<tr>
<td>Four Way</td>
<td>LE 1224-2</td>
<td>20</td>
<td>120/277</td>
</tr>
<tr>
<td>Pilot Light</td>
<td>LE 1221-PL</td>
<td>20</td>
<td>120/277</td>
</tr>
<tr>
<td>Momentary Contact</td>
<td>LE 1257</td>
<td>20</td>
<td>120/277</td>
</tr>
<tr>
<td>Double Pole</td>
<td>LE 1222-2</td>
<td>20</td>
<td>120/277</td>
</tr>
<tr>
<td>Single Pole, Key Op.</td>
<td>LE 1221-2L</td>
<td>20</td>
<td>120/277</td>
</tr>
<tr>
<td>Three Way, Key Op.</td>
<td>LE 1223-2L</td>
<td>20</td>
<td>120/277</td>
</tr>
<tr>
<td>Four Way, Key Op.</td>
<td>LE 1224-2L</td>
<td>20</td>
<td>120/277</td>
</tr>
</tbody>
</table>

d) Where switches are shown side-by-side in the same location, or shown in the same location on the lighting and power plans separately, gang all switches together in the same box with a single coverplate (whether detailed specifically on the drawings, or not).

e) Where wall dimmers are indicated, provide slide with on/off type rated for the full load and type it serves. Include all power extenders as required. Follow manufacturer’s requirements for de-rating switches in ganged installations. Provide back-box installation per the manufacturer’s requirements. Color of switch and coverplate shall match other wiring devices.

f) Equivalent switches by Cooper Wiring, Hubbell, Pass & Seymour, Bryant, or Leviton.

**16B-17 RECEPTACLES:**

a) Provide Leviton specification grade NEMA WD-1 – 1974 grounding receptacles with gray or color as selected by A/E.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>NEMA</th>
<th>CAT. #</th>
<th>AMP</th>
<th>VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duplex</td>
<td>5-20R</td>
<td>LE 5353</td>
<td>20</td>
<td>125</td>
</tr>
<tr>
<td>Dual Voltage</td>
<td>5-20R/6-20R</td>
<td>LE 5842</td>
<td>20</td>
<td>125/250</td>
</tr>
<tr>
<td>Ground Fault</td>
<td>5-20R</td>
<td>LE 6899-A</td>
<td>20</td>
<td>125</td>
</tr>
<tr>
<td>Isolated Ground</td>
<td>5-20R</td>
<td>LE 5363-1G</td>
<td>20</td>
<td>125</td>
</tr>
<tr>
<td>Surge Protective</td>
<td>5-20R</td>
<td>LE 5380</td>
<td>20</td>
<td>120</td>
</tr>
</tbody>
</table>

b) Provide Leviton weatherproof receptacles as follows:

Install device in Leviton No. 5977-GY gray "While-In-Use" cover for weatherproof in use (WPI).

c) Equivalent receptacles by Cooper Wiring, Hubbell, or Pass & Seymour.

d) Provide Leviton grounding receptacles as follows:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>NEMA</th>
<th>CAT. #</th>
<th>AMP</th>
<th>VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination</td>
<td>10-30</td>
<td>LE 278</td>
<td>30</td>
<td>125/250</td>
</tr>
<tr>
<td>Combination</td>
<td>10-50</td>
<td>LE 279</td>
<td>50</td>
<td>125/250</td>
</tr>
</tbody>
</table>

GENERAL POWER AND LIGHTING 16B p10
e) GFCI receptacles, where indicated or required by code, shall be installed in accessible locations. They shall not be installed concealed behind equipment, in attics, above ceilings, inside electric water cooler housings, etc… Where a GFCI receptacle is shown on the drawings where it may be concealed, the contractor shall provide a GFCI circuit breaker in the panel.

16B-18 FLUSH WALLPLATES:

a) Provide Leviton Type 302 stainless steel wallplates conforming to UL, NEMA and Federal Specification WP-455A.

b) Provide wallplates for all switches, receptacles, blanks, telephone, computer, and special purpose outlets.

c) Plates shall be modern design, having rounded edges and corners complete with finish-matching mounting screws.

d) Provide flush wallplates on wiremold switch and receptacle boxes.

e) Provide factory engraved wallplates where indicated. Where engraved text is not outlined, submit two (2) copies of proposed text to A/E for review and approval prior to engraving.

f) Wallplates shall not support wiring devices. Provide wiring device accessories as required to properly install devices and wallplates.

g) Provide wallplates of one design throughout the building.

h) Provide designs and finishes equivalent to above specification where wallplates for special devices are available only from manufacturer of device.

i) Verify with A/E finish of any plate where is may be apparent a special finish or color should have been specified.

j) Provide narrow wallplates as indicated.

k) Ganged wiring devices shall have a single wallplate.

l) Provide wallplates manufactured by same company as wiring devices.

16B-19 LIGHTING FIXTURES:

a) Provide fixtures complete with lamps and accessories required for hanging. E/C shall ensure that lamps, reflectors, lens, and trim are clean at time of final inspection. Mount recessed fixtures with trim flush to ceilings, free of gaps or cracks.

b) Coordinate mounting of ceiling mounted lighting fixtures with G/C. Where additional ceiling or fixture supports are required due to fixture location or weight they shall be provided by E/C, unless otherwise specified under ceiling specifications.

c) Provide inside frosted (IF) incandescent lamps unless otherwise called for in fixture schedule.


e) Fixture lamps shall be lamp type recommended by E/M. Lamp no fixtures above E/M’s recommended maximum wattages.
f) For all light fixtures in food preparation areas, the fixtures shall be provided with lensed covers or lamps that are coated and labeled as shatter resistant. Where not specifically included in the specification, the contractor shall include all provisions to comply with this requirement.

g) Fluorescent fixture ballast shall be Class "P" high power factor type (over 90 percent). Ballast shall comply with ANSI C82.11, certified and labeled by "CMB/ETL", and shall be UL listed. Ballast shall have sound rating indicated on ballast case and rated as follows:

<table>
<thead>
<tr>
<th>BALLAST TYPE</th>
<th>SOUND RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Heat – Rapid Start</td>
<td>A</td>
</tr>
<tr>
<td>Trigger Start</td>
<td>A</td>
</tr>
<tr>
<td>Instant Start</td>
<td>B</td>
</tr>
<tr>
<td>High Output</td>
<td>C</td>
</tr>
</tbody>
</table>

h) Contractor responsible for coordination of all dimming ballasts with associated fixture and dimmer. Install per manufacturer’s recommendations.

i) Provide metal halide fixtures with peak-lead auto-transformer type ballast.

j) Consult Architectural plans for ceiling types and provide recessed fixtures and mounting components accordingly. All light fixture installation in fire rated ceilings shall comply with UL listing for rated assembly.

k) Fixture supports shall comply with NEC 410-15 and 410-16. Provide fixture securing clips as required.

l) The light fixture manufacturer shall provide a linear disconnecting means complying with NEC 410.73 for all fluorescent and double ended lamp fixtures.

m) The contractor shall replace any lamps that are not operational or burn out within first 30 days after substantial completion.

n) See fixture schedule.

16B-20 CIRCUIT BREAKER PANELBOARDS:

a) Provide dead-front panelboards with bolt-in or plug-on molded case circuit breakers and NEMA Publication PB-1 957 and UL 67 for panelboards.

b) Boxes shall be galvanized steel standard width and depth except where scheduled otherwise. Fronts shall be code gauge steel finish with rust inhibiting primer and based enamel finish. Fronts shall have flush doors with flush cylinder tumbler-type locks, spring loaded door pulls, and concealed door hinges. Provide doors higher than 48 inches with three (3) point catch. Panel door locks shall be keyed alike. Provide fronts designed for flush or surface mounting as indicated and attached to box by adjustable trim clamps.

c) Provide tin-finished copper bars full length of panel with rating listed in schedule. Bus bar connections to branch circuit breakers shall be “Phase Sequence” type designed and assembled so circuit breakers can be replaced without disturbing adjacent breakers or without removing main bus or branch circuit connectors. Provide bus bars with wire lugs suitable or copper or aluminum conductors. Provide each panel with equipment grounding bus grounded to box and neutral bus insulated from box.

d) Branch circuit breakers shall be quick-make, quick-break with trip indication. Circuit breakers shall operate both manually for normal switch functions and automatically under overload and short circuit conditions. They shall provide circuit and self protection when applied within their rating. Operating mechanisms shall be entirely trip free so that contacts cannot be held closed against a short circuit. Operating handle of circuit breaker shall simultaneously open and close all poles of a multiple breaker. Circuit breakers shall conform to NEMA P1311-11 964 and be approved by UL. Circuit
breaker shall have a thermal magnetic trip unit for each pole for inverse time delayed overload protection and an instantaneous magnetic element for short circuit protection. Trip elements shall operate a common internally connected trip bar to open all poles in case of overload or short circuit through any one (1) pole. Panel shall provide for branch circuit breakers up to 100 amperes, and unless indicated otherwise, shall have 10,000 RMS short circuit amperes symmetrical interrupting capacity. Breakers shall be one, two, or three pole types as indicated in panel schedule.

e) Panels shall have branch circuit directory holders with clear plastic cover. Provide neatly typed circuit directory listing loads corresponding to branch circuit numbers.

f) Provide one spare 0.75 inch conduit for every three (3) spaces and/or blank spaces with a minimum of three (3) spare conduits per panel. Terminate conduit above ceilings unless indicated otherwise.

g) Panelboard shall be General Electric, ITE/Siemens, Square D, or Eaton/Cutler-Hammer.

h) See schedule.

16B-21 CIRCUIT BREAKER DISTRIBUTION PANELBOARDS:

a) Panelboards shall be the I-Line distribution panelboards as manufactured by Square-D.

b) Provide distribution and power panelboards as indicated in the panelboard schedule and where shown on the plans. Panelboards shall be equipped with thermal-magnetic, molded case circuit breakers of frame and trip ratings as shown on the schedule. Panelboard shall conform to NEMA PB1-1957 and UL 67 for panelboards.

c) Panelboard bus structure and main breaker shall have current ratings as shown on the panelboard schedule. Such ratings shall be established by heat rise tests with maximum hot spot temperature on any connector or bus bar not to exceed 50 deg C rise above ambient. Heat rise tests shall be conducted in accordance with UL 67. The use of conductor dimensions will not be accepted in lieu of actual heat tests.

d) Branch circuit breakers shall be Square D FA, KA, LA, MA, NH, PA and/or PC 1-, 2-, or 3-pole molded case circuit breakers rated 15 through 2500 amperes, (120 V ac) (240 V ac), as specified on the drawings. Breakers shall be standard construction. All circuit breakers shall be UL and CSA listed, IEC 157-1 rated, meet NEMA AB1-1975, and Federal Specification W-C 375B/GEN, when applicable. Molded case circuit breakers shall have over center toggle-type mechanisms, providing quick-make, quick-break action. Breakers shall be calibrated for operation in an ambient temperature of 40 deg C. Each circuit breaker shall have trip indication by handle position and shall be trip-free. 2- and 3-pole breakers shall be common trip. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole. Circuit breakers with frame sizes greater than 100 amperes shall have variable magnetic trip elements which are set by a single adjustment (to assure uniform tripping characteristics in each pole). A push-to-trip button shall be provided on the cover from mechanically tripping the circuit breaker. The circuit breaker shall have reverse connection capability and be suitable for mounting and operating in any position. Unless otherwise indicated, branch circuit breakers up to 100 amperes shall have 10,000 RMS short circuit amperes symmetrical interrupting capacity. Circuit breakers above 100 ampere shall have 42,000 RMS capacities.

e) Each panelboard, a complete unit, shall have a short circuit rating equal to or greater than the integrated equipment rating shown on the panelboard schedule or on the plans. This rating shall be established by testing with the overcurrent devices mounted in the panelboard. The short circuit tests on the overcurrent devices and on the panelboard structure shall be made simultaneously by connecting the fault to each overcurrent device with the panelboard connected to its rated voltage source. Method of testing shall be per UL 67. The source shall be capable of supplying the specified panelboard short circuit current or greater. Testing of panelboard overcurrent devices for short circuit rating only while individually mounted is not acceptable. Also, testing of the bus structure by applying a fixed fault to the bus structure alone is not acceptable. Panelboards shall be marked with their maximum short circuit current rating at the supply voltage and shall be UL listed.
f) Panelboard assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel to be as specified in UL 50 for cabinets. The size of wiring gutters shall be in accordance with UL 67. Cabinets to be equipped with latch and tumbler-type lock on door of trim. Doors over 48 inches long shall be equipped with three-point latch and vault lock. All locks shall be keyed alike. Endwalls shall be removable. Fronts shall be of code gauge steel. Gray baked enamel finish electro-deposited over clean phosphatized steel.

g) The panelboard interior assembly shall be dead front with panelboard front removed. Main lugs or main breakers shall have barriers on five sides. The barrier in front of the main lugs shall be hinged to a fixed part of the interior. The end of the bus structure opposite the mains shall have barriers.

h) Equivalent manufacturers shall be General Electric, ITE/Siemens, Square D, or Eaton/Cutler-Hammer.

16B-22 TRANSIENT VOLTAGE SURGE SUPPRESSION:

a) Transient Voltage Surge Suppressors shall also be referred to as TVSS.

b) Surge Protective Devices shall be provided at the following locations:

1. Each main service entrance distribution panelboard, panelboard, switchboard or disconnect switch, whether specifically shown or noted on the electrical riser diagram or plans. Where the service main is a disconnect switch, locate TVSS at the first distribution or branch panelboard downstream. Where there is not a distribution panelboard or branch panelboard, tap the incoming conductors as allowed by the National Electric Code, and provide TVSS with integral fused disconnecting means.

2. Any other location as noted on the electrical riser diagram or plans.

c) TVSS installed integral to the panelboard, distribution panelboard or switchboard shall not be allowed.

d) TVSS shall be provided and installed as follows:

1. Work Included:

   A. Transient Voltage Surge Suppression/Filter System: Service Entrance – High Exposure.

   B. Provide a complete TVSS system, including (but not limited to), an externally mounted TVSS unit, all interconnecting wiring between the main bus of the panelboard and the TVSS unit, all conduit and all necessary hardware or accessories necessary for a complete installation in compliance with the equipment manufacturer’s requirements.

   C. The contractor shall be responsible for providing a 3-pole circuit breaker in the panelboard to feed the TVSS unit, whether specifically scheduled or not. The size of the breaker shall be as recommended by the TVSS manufacturer for the specific equipment provided.

   D. The contractor shall be responsible for all wiring between the breaker and the external TVSS and it shall be sized and installed as recommend by the TVSS manufacturer for optimum operation. Where the lead length exceeds 5’, the contractor shall use low impedance (HPI) cable to reduce the lead length’s effect on the installed performance of the SPD. HPI cable shall be provided and installed as recommended by the equipment manufacturer (Thomas and Betts).

2. Quality Assurance:
A. Comply with the latest edition of the applicable provisions and recommendations of the following, except as otherwise stated in these specifications:

i. UL 1449 3rd Edition 2009 Revision.

ii. UL1283. (complimentary listing is not approved)


v. UL96A.

vi. IEEE 1100 Emerald Book.


3. Submittals:

A. Package must include shop drawings complete with all technical information, unit dimensions, detailed installation instructions, maintenance manual, recommended replacement parts list and wiring configuration.

B. Copies of Manufacturer’s catalog data, technical information and specifications on equipment proposed for use.

C. Copies of documentation stating that the Surge Protection Device is listed by UL to UL1449 3rd Edition, category code VZCA.

D. Copies of actual let through voltage data in the form of oscillograph results for both ANSI/IEEE C62.41 Category C3 (combination wave) and B3 (Ring wave) tested in accordance with ANSI/IEEE C6245.

E. Copies of Noise Rejection testing as outlined in NEMA LS1-1992 (R2000) Section 3.11. Noise rejection is to be measured between 50kHz and 100MHz verifying the devices noise attenuation. Must show multiple attenuation levels over a range of frequencies.

F. Copies of test reports from a recognized independent testing laboratory, capable of producing 200kA surge current waveforms, verifying the suppressor components can survive published surge current rating on a per mode basis using the ANSI/IEEE C62.41 impulse waveform C3 (8 x 20 microsecond, 20kV/10kA). Test data on an individual module is not acceptable.

G. Copy of warranty statement clearly establishing the terms and conditions to the building/facility owner/operator.

H. Submit Name of Factory Representative to perform startup and testing.

I. Warranties.

4. Products:

A. Unless noted otherwise on the drawings (plans or riser), provide the model TG3-100-240-3H-MN-[feed per field conditions]-M2-F-2 by Current Technology for main electrical service panel.

B. Equivalents allowed by National Lightning Protection and Innovative Technology/Eaton provided all requirements of the specifications below are met and submitted prior.
C. TVSS shall meet all the requirements and test procedures as outlined in NEMA LS-1 Standards “LOW VOLTAGE SURGE PROTECTIVE DEVICES”. The unit shall be tested as a complete unit, with all fuses in place. A unit tested without fuses shall be considered as not compliant to NEMA LS-1. TVSS shall meet the following minimum requirements:

i. Nominal voltage rating shall be three-phase, four-wire to match the main panel/switchboard voltage.

ii. Protection Method: MOV.

iii. Declared Maximum Continuous Operating Voltage (MCOV) shall be greater than 115 percent of the nominal operating voltage and in compliance with test and evaluation procedures outlined in the nominal discharge surge current test of UL 1449 3rd Edition, section 37.7.3. MCOV values claimed based on the component’s value or on the 30-minute 115% operational voltage test, section 38 in UL1449 will not be accepted.

iv. Unit shall have no more than 10% deterioration or degradation of the UL1449 3rd Edition Voltage Protection Rating (VPR) when exposed to a minimum of 5000 repeated category C3 (20kV/10kA) surges. The SPD manufacturer must provide a test report validating the repetitive surge test was performed.

v. Maximum continuous operating voltage rating: 150/275V @ 120/208V;

vi. Each MOV shall be separately fused. Fuses shall be UL 248-1 recognized and tested at 200K AIC. Fuses shall also be rated for a minimum of 14,000 amps of surge current. All circuitry to be copper bus construction. Plug in modules in the surge current path are not acceptable. Fuses not listed to UL 248-1 are not approved.

vii. “Tested Single Pulse Surge Current/Repetitive Surge Current Capacity Rating” per mode shall be the minimum as follows:

(a) L-N: 100,000 amps/7,000 Impulses
(b) N-G: 100,000 amps/7,000 Impulses
(c) L-G: 100,000 amps/7,000 Impulses
(d) L-L: 200,000 amps/14,000 Impulses
(e) Per Phase: 200,000 amps/14,000 Impulses

viii. Repetitive Surge Current Capability shall be per actual tested values. Test reports are required to be submitted with the shop drawings.

ix. Enclosure shall be NEMA 3R rated where installed outdoors, NEMA 1 rated where installed indoors, unless noted otherwise. Refer to the plans for location.

x. Provide Standard monitoring system to include LED/phase indicators, audible alarm, dry relay contacts and a surge counter.

xi. Response time of the system shall be < 0.5 nanoseconds.

e) Installation, Start-up and Warranty:

1. Follow all manufacturer’s installation instructions and requirements.
2. The TVSS system shall be provided with a minimum 15-year warranty from the time of substantial completion.

3. Surge Protectors shall be installed as close as practical to the electrical panel or dedicated electronic equipment to be protected. The SPD shall be close connected to the panel in a position near the panel board neutral bus bar or positioned so that the overall lead length will be minimal.

4. The Surge Protector shall be installed in a manner consistent with proper and acceptable industry wiring practice. SPD connection leads shall be as short and straight as possible while avoiding sharp bends.

5. Surge Protectors provided with terminals shall be wired with stranded conductor size permitted within rating of lugs. Wire from circuit breaker to surge protector shall be installed in accordance with the National Electric Code and equipment manufacturer.

6. Local Factory representative shall perform start up and testing. Factory trained representative shall test the installed units with a portable surge generator to verify that the unit suppressed voltage within factory guidelines – in all modes. Also, the testing will verify the integrity of the neutral to ground bond [XO]. Additionally, testing shall be done with a factory meter to verify 100 percent suppression capability in all modes of the MOV’s and filters. The test report shall be sent to the specifying engineer for the project records to verify performance.

16B-23 GROUNDING:

a) Supplement grounded neutral of secondary distribution system with equipment grounding system, installed so that metallic structures, enclosures, raceways, junction boxes, cabinets, machine frames, portable equipment, and other conductive items operate continuously at ground potential and provide low impedance path for ground fault currents. System shall comply with NEC, modified as indicated on drawings as specified.

b) Provide equipment ground bus in base of main electrical panel. Braze or otherwise adequately connect ground system to at least three (3) 0.75-inch diameter by 10-foot ground rods. Where extra rods are necessary to meet requirements of specified tests, E/C shall be reimbursed for additional cost. Rods shall be located a minimum of 6 feet from each other of any other electrode and shall be interconnected by a minimum 3/0 bare copper conductor brazed to each ground rod below grade.

c) Ground all metallic water piping systems (domestic water, etc.) in the building to electrical service ground with a minimum 3/0 or as required green insulated copper ground conductor, in conduit. Where a dielectric fitting is installed anywhere in the system, or where a non-conductive fitting is installed, the piping system on each side of the fitting shall be separately bonded. On the main water service, connect ground conductor to building side of dielectric water fittings. Do not install jumpers around dielectric water fittings. Bond piping to ground conductor at each end. Provide 3/0 jumper with ground clamps around water meter. Coordinate with mechanical contractor and include all associated costs in the base bid.

d) Provide grounding electrode system as required by the applicable National Electrical Code Section 250.

e) Connect system neutral ground and equipment ground system to common ground bus.

f) Ground secondary services at supply side of each individual secondary disconnecting means and at related transformers in accordance with NEC. Provide each service disconnect enclosure with neutral disconnecting means which interconnect with insulated neutral and uninsulated equipment ground sub to establish system common ground point. Neutral disconnecting links shall be located so that low voltage neutral bar with interior secondary neutrals can be isolated from common ground bus and service entrance conductors.
g) Required equipment grounding conductors and straps shall be sized in compliance with NEC Table 250-66. Equipment grounding conductors shall be provided with green Type TW 600 volt insulation. Related feeder and branch circuit grounding conductors shall be connected to ground bus with approved pressure connectors. Provide feeder servicing several panelboards with a continuous grounding conductor connected to each related panelboard ground bus.

h) Aluminum conductors, straps, or bars may be substituted for copper items of consistent with materials used for phase conductors. Substitute materials shall be comparable in current carrying capacity, temperature rise, and mechanical strength. Installation shall include necessary precautions regarding terminations with dissimilar metals.

i) Provide low voltage distribution system with a separate green insulated equipment grounding conductor for each single or 3-phase feeder and each branch circuit except as specified herein. Where more than one branch circuit is installed in a common raceway only one grounding conductor is required. Grounding conductor shall be sized for largest branch circuit overcurrent device serving common raceway.

j) Single phase 120 volt branch circuits for lighting shall consist of phase and neutral conductors installed in common metallic conduit which shall serve as grounding conductor. Provide flexible metallic conduit utilized in conjunction with above single phase branch circuits with suitable green insulated grounding conductors. Single phase branch circuits required for special equipment, such as X-ray, etc., feeders and branch circuits in non-metallic conduits shall be provided with separate grounding conductor. Install grounding conductor in common conduit with related phase and/or neutral conductors. Where parallel feeders are installed in more than one raceway, each raceway shall have a green insulated equipment grounding conductor.

k) E/C shall provide equipment grounding bars for termination of equipment grounding conductors in panelboards and other electrical equipment. In addition to active circuits, provide pressure connectors for panel spares and blank spaces. E/C responsible for grounding of all CATV, phone, and telecommunication systems per NEC. Coordinate with system provider.

l) Provide electrical expansion fitting with an external flexible copper ground securely bonded by approved grounding straps on each end of fitting except where UL approved built-in copper grounding device is provided.

m) Provide non-metallic conduits or ducts with equipment grounding conductors except for conditions as follows:

1. Where ducts are for telephone or communication uses only.

n) Connect each cable rack system to equipment grounding system with insulated conductor with size determined by largest power conductor in rack. Minimum size shall be No. 6 and maximum size shall not exceed equivalent capacity of number 4/0 copper conductor. Ground conductor shall be bonded to rack system, enclosed in conduit, and connected to common ground bus.

o) Provide electric devices such as air cleaners or heater control switches, etc., installed in air ducts with insulated equipment ground conductor sized on rating of overcurrent device supplying unit. Bond conductor to each unit, air duct, and to ground in panelboard.

p) Provide electric immersion type water heater or surface heating cables with insulated equipment ground conductor sized on rating of overall device supplying unit. Bond conductor to water piping at unit and to ground bar in panelboard.

q) Provide steel and aluminum conduits which terminate without mechanical connection to metallic housing of electrical equipment with ground bushing and connect each bushing with bare copper conductor to ground bus in electrical equipment. Electrically non-continuous metallic conduits containing ground wiring only shall be bonded to ground wire at both conduit entrance and exit.
r) Ground and bond exterior mounted light poles, radio and television masts and flag poles with No. 6 or larger bare copper wire connected to 96-inch long, 0.75-inch copper clad ground rod driven in ground.

s) At the Contractor’s option brazing connections may be substituted with Burndy HyGround Irreversible Compression Grounding Connector system. No other alternative methods or manufacturers will be allowed without written approval by Engineer. If Burndy system is used, compression die index number must be permanently marked on connectors during crimping so that the use of the correct dies can be verified. Closed barrel connectors must have inspection holes at the appropriate location to verify proper cable insertion.

t) Test complete equipment grounding system to each service disconnect enclosure ground bar with Vibroground test unit manufactured by Associated Research Inc. Resistance, without chemical treatment or other artificial means, shall not exceed 5 ohms to ground. Submit certified test reports of compliance with 5 ohm value.

u) Provide a No. 6 ground conductor to all telephone/computer/television/audio/visual racks in all telephone equipment rooms (and where indicated in the contract documents) whether specifically shown or noted on the drawings. Provide a minimum of 60 inches of free wire at the termination for connection to owner-provided racks. Coordinate exact location and requirements with the owner prior to any rough-in.

v) All equipment and panel grounds shall be bonded to a common building ground system per the national electric code, whether specifically shown on the electrical riser diagram or not. This includes all of the separately derived systems in the building (transformers) that are required to bond to the nearest grounding electrode. This shall be provided per section 250.30 of the NEC, by the electrical contractor and included in the base bid. Comply with all requirements by local authority having jurisdiction.

16B-24 PLENUM CABLE FIRE RATED PATHWAY DEVICE:

a) General:

1. Furnish and install EZ-Path fire rated wiring devices and associated hardware as shown on the Contract Drawings or as required in all corridor/hallway fire rated walls and as hereinafter specified as manufactured by Specified Technologies, Inc. or equal. All devices shall be UL listed and tested in accordance with ASTM E814. Equivalent by Wiremold Flamestopper or by prior approval only.

2. All devices shall be heavy-duty specification grade with an intumescent insert material allowing for 0 to 100-percent visual fill of conductors.

b) Wiring devices:

1. Cables passing through fire-rated floors or walls shall pass through fire-rated wiring devices which contain an intumescent insert material that adjusts automatically to cable additions or subtractions.

2. The device shall have an F Rating equal to the rating of the barrier in which the device is installed.

3. Wiring devices shall be capable of allowing a 0 to 100-percent visual fill of cables.

4. Wire devices shall be of a sufficient size to accommodate the quantity and size of electrical wires and data cables required.

5. Wire devices to be provided with steel wall plates allowing for single or multiple devices to be ganged together.

c) Installation:
1. Wiring devices shall be installed in locations as required on the Contract Drawings, arranged singly or in gangs at the height specified.

2. Install the devices in strict accordance with the approved shop drawings and the equipment manufacturer’s recommendations.

3. Apply the factory supplied gasketing material prior to the installation of the wall plates.

4. Secure wall plates to devices per the equipment manufacturer’s recommendations.

16B-25 VACANCY SENSORS:

1. Refer to details on drawings for application of vacancy sensors.

2. Equivalent manufacturer by Wattstopper, Leviton, Greengate, and Hubbell or by prior approval only.

16B-26 TIME SWITCHES:

a) Provide time switches as indicated on drawings and in schedule.

b) Equivalent by Intermatic, Tork, or Rainbird.

c) See time switch schedule.

16B-27 FIRE ALARM SYSTEM SPECIFICATION:

a) Related Documents:

1. Drawings and general provisions of the contract including general and supplementary conditions and Division 1 specification sections, apply to this section.

2. Requirements of the following Division 16 sections apply to this section.

   A. “16 A – General Requirements.”

   B. “16B – General Equipment, Wiring and Material.”

   C. The complete installation is to conform to the applicable sections of NFPA 72 and the NEC with particular attention to Article 760.


b) Summary:

1. This section includes fire alarm systems, including manual stations, detectors, notification appliances, signal equipment, controls, smoke control and devices. Provide a new fire alarm sub-panel Honeywell Notifier and integrated via Fiber connection to existing Notifier FireWarden NFW2-100 panel located in Camp Aldrich Conference Center.

2. Work covered by this specification section includes the furnishing of labor, equipment, materials, and complete operational performance required for installation of the fire alarm system as shown on the drawings, as specified, and as directed by the A/E.

3. The work covered by this section of the specification is to be coordinated with the related work as specified elsewhere under the project specifications.
4. The fire alarm system shall consist of all necessary hardware equipment and software programming to perform the following functions:

   A. Fire alarm and detection operations.

   B. Fire suppression appliances, and/or off-premise notification.

c) System Descriptions:

1. General: Complete, non-coded, addressable, microprocessor-based fire detection and alarm system with manual and automatic alarm initiation.

2. Audible Alarm Notification: Transmission shall be addressable signal transmission, dedicated to fire alarm service only.

3. System connections for alarm-initiation and alarm-notification circuits shall be Class B.

4. Functional Description: The following are required system functions and operating features:

   A. Priority of Signals: Accomplish automatic response functions by the first zone initiated. Alarm functions resulting from initiation by the first zone are not altered by subsequent alarms. The highest priority is an alarm signal. Priority two (2) supervisory service and trouble signals have second-, third-, and fourth-level priority. Signals of a higher-level priority take precedence over signals of lower priority even though the lower-priority condition occurred first. Annunciate all alarm signals regardless of priority or order received.

   B. Non-interfering: Zone, power, wire, and supervise the system so a signal on one (1) zone does not prevent the receipt of signals from any other zone. All zones are manually resettable from the FACP after the initiating device or devices are restored to normal.

   C. Signal Initiation: The manual or automatic operation of an alarm-initiating or supervisory-operating device shall cause the FACP to transmit an appropriate signal including:

      i. General alarm.

      ii. Fire-suppression alarm.

      iii. Manual station alarm.

      iv. Smoke or Carbon Monoxide detector alarm.

      v. System trouble.

   D. Transmission to Remote Central Station: Shall be accomplished through existing cellular dialer located in main FACP in Conference Center.

   E. Loss of primary power at the Panel shall sound a trouble signal at the FACP and shall indicate at the FACP when the system is operating on an alternate power supply.

   F. Annunciation: Manual and automatic operation of alarm and supervisory initiating devices shall be annunciated both on the FACP and on the remote annunciator.

   G. FACP Alphanumeric Display: Shall display plain-language description of alarms, trouble signals, supervisory signals, monitoring actions, system and component status, and system commands.
H. General Alarm: A system general alarm shall include:

i. Indicating the general alarm condition at the FACP and the remote annunciator.

ii. Identifying the device at the FACP and annunciator.

iii. All audible alarm notification appliances shall operate continuously until the alarm silence switch is operated.

iv. Notification at local fire department.

v. Any subsequent zone alarm shall reactivate the alarm notification appliances.

I. Smoke Sensor Sensitivity Adjustment:

i. Authorized operation of controls at the FACP shall cause the selection of specific addressable smoke sensors for adjustment, display of their current status and sensitivity settings, and control of changes in those settings.

J. Smoke Sensor Sensitivity: Between 0.2 and 3.7 percent-per-foot smoke obscuration when tested according to UL 268.

K. The control unit shall maintain a moving average of the sensors smoke chamber value to automatically compensate (move the threshold) for dust, dirt, and component degradation conditions that could affect detection operations. The control unit shall automatically maintain constant smoke obscuration sensitivity for each sensor (via the floating threshold) by compensating for environmental factors.

L. The control unit shall automatically indicate when an individual sensor needs cleaning. When a sensor's average value reaches a predetermined value, a “DIRTY SENSOR” trouble condition shall be audibly and visually indicated at the control unit for the individual sensor. Additionally, the LED on the sensor base shall glow steady giving a visible indication at the sensor location. If a “DIRTY SENSOR” is left unattended, and its average value increases to a second predetermined value, an “EXCESSIVELY DIRTY SENSOR” trouble condition shall be indicated at the control unit for the individual sensor. To prevent false alarms, these “DIRTY” conditions shall in no way decrease the amount of smoke obscuration necessary for system activation.

M. The control unit shall continuously perform an automatic self-test routine on each sensor which will functionally check sensor electronics and ensure the accuracy of the values transmitted to the control unit. Any sensor that fails this test shall indicate a “SELF TEST ABNORMAL” trouble condition.

5. Alarm Silencing:

A. If the “Alarm Silence” button is pressed, all audio alarm signals shall cease operation.

B. Signals shall not be silenced during the 90 second alarm silence inhibit mode.

6. System Reset:

A. The “System Reset” button shall be used to return the system to its normal state after an alarm condition has been remedied. Display message shall provide operator assurance of the sequential steps (“IN PROGRESS,” “RESET COMPLETED”) as they occur, should all alarm conditions be cleared.
B. Should an alarm condition continue, the system shall remain in an alarmed state. Systems control relays shall not reset. The control unit alarm LED shall remain on. The alarmed points will not require acknowledgment if they were previously acknowledged.

7. Power Requirements:

A. The control unit shall receive 120 VAC power via a dedicated fused disconnect.

B. The system shall be provided with sufficient battery capacity to operate the entire system upon loss of normal 120 VAC power in a normal supervisory mode for a period of 24 hours with five (5) minutes of alarm operation at the end of this period. The system shall automatically transfer to battery standby upon power failure. All battery charging and recharging operations shall be automatic.

C. All circuits requiring system-operating power shall be 24 VDC and shall be individually fused at the control unit. A green “Power On” LED shall be displayed continuously while incoming power is present.

D. The incoming power to the system shall be supervised so that any power failure will be indicated at the control unit. A green “power on” LED shall be displayed continuously while incoming power is present.

E. The system batteries shall be supervised so that a low battery condition or disconnection of the battery shall be indicated at the control unit.

F. The system shall support 100 percent of addressable devices in alarm or operated at the same time, under both primary (AC) and secondary (battery) power conditions.

G. Loss of primary power shall sound a trouble signal at the FACP. FACP shall indicate when the system is operating on an alternate power supply.

d) Submittals:

1. General: Submit the following according to conditions of contract and Division 16 specification sections.

2. Product Data for System Components: Include dimensioned plans and elevations showing minimum clearances and installed feature and devices. Include list of materials and NRTL-listing data.

3. Submissions to Authority Having Jurisdiction: In addition to routine submissions of the above material, make an identical submission to the authority having jurisdiction. Include copies of annotated contract drawings as required to depict component locations to facilitate review. Upon receipt of comments from the authority, submit them for review. Make resubmissions if required to make clarifications or revisions to obtain approval.

4. The submittal shall also include one set of plans signed and sealed by a licensed engineer with all devices located on the plans and numbered individually. It shall also include a detailed riser diagram with all devices, battery calculations and wiring requirements indicated on the plans. The fire alarm shop drawings shall not be approved without this submittal.

5. Submittals shall include documentation on UV protection for all detector housings. Detectors of any kind which discolor (turn yellow) when subjected to fluorescent lighting shall not be accepted. The manufacturer shall warrant that all detectors which discolor shall be replaced at no cost to the owner.

e) Quality Assurance:
1. Installer Qualifications: A factory-authorized installer is to perform the work of this section.

2. Compliance with Local Requirements: Comply with the applicable building code, local ordinances and regulations, and the requirements of the authority having jurisdiction.

3. All items of the fire alarm system shall be listed as a product of a single manufacturer under the appropriate category of UL shall be the UL label.

f) Manufacturers:

1. Base bid shall be Honeywell Notifier.

2. All system components shall be fully UL listed compatible with existing fire alarm control panel in Conference Center.

3. Request for substitutions shall be in accordance with Section 16A.

g) Manual Pull Stations:

1. Description: addressable, double action, with Flush Mounting Plate

h) Smoke Sensors:

1. General: Comply with UL 268, “Smoke Detectors for Fire Protective Signaling Systems.” Include the following features:

   A. Factory Nameplate: Serial number and type identification.

   B. Operating Voltage: 24 VDC, nominal.

   C. Addressability: Sensors include a communication transmitter and receiver in the mounting base having a unique identification and capability for status reporting to the FACP. Detectors that store the device address in the head shall be acceptable. Sensors do not require resetting or readjustment after actuation to restore normal operation.

   D. Each sensor base shall contain an LED that will flash each time it is scanned by the control unit (once every 4 seconds). In alarm condition, the sensor base LED shall be on steady.

   E. Each sensor base shall contain a magnetically actuated test switch to provide for an easy alarm testing at the sensor location.

   F. Each sensor shall be scanned by the control unit for its type identification to prevent inadvertent substitution of another sensor type. Upon detection of a “wrong device,” the control unit shall operate with the installed device at the default alarm settings for that sensor; 2.5 percent obscuration for photoelectric sensor, 135 deg F and 15 deg F rate-of-rise for heat sensor, but shall indicate a “wrong device” trouble condition.

   G. The sensor’s electronics shall be immune from false alarms caused by EMI and RFI.

   H. Removal of the sensor head for cleaning shall not require the setting of addresses.

2. Photoelectric Smoke Detectors: Include the following features and characteristics:

   A. An infrared detector light with matching silicon cell receiver and actuated by the presence of visible products of combustion. Must have seven sensitivity settings and transmit actual values to the FACP.

3. All detector housing shall be UV protected for use with indirect fluorescent lighting.
i) Other Detectors:

1. **Addressable Thermal Sensor:** Rate-compensated/fixed-temperature type with plug-in base and alarm indication lamp. Detectors have a communication transmitter and receiver with unique identification and capability for status-reporting to the FACP.

2. **Addressable Carbon Monoxide Sensor:** Combination Smoke and Carbon Monoxide Sensors may be utilized. Detectors have a communication transmitter and receiver with unique identification and capability for status-reporting to the FACP.

3. All detector housings shall be UV protected for use with indirect fluorescent lighting.

j) Alarm Notification Appliances:

1. **Notification Appliances:** The Contractor shall furnish and install non-addressable notification appliances and accessories to operate on compatible signaling line circuits (SLC).

2. **Visible/Only (V/O):** Strobe shall be listed to UL 1971. The V/O enclosure shall mount directly to standard single gang, double gang, or 4-inch square electrical box without the use of special adapters or trim rings. V/O appliances shall be provided with different minimum flash intensities of 15cd, 75cd, and 100cd. Provide a label inside the strobe lens to indicate the listed candela rating of the specific V/O appliance.

3. **Audible/Visible (A/V):** Combination A/V notification appliances shall be listed to UL 1971 and UL 464. Provide a label inside the strobe lens to indicate the listed candela rating of the specific strobe. The horn shall have a minimum sound pressure level of 80 dBA at 24 VDC. The A/V enclosure shall mount directly to standard single gang, double gang, or 4-inch square electrical box without the use of special adapters or trim rings.

k) Addressable Circuit Interface Modules:

1. **Addressable Circuit Interface Modules:** Arrange to monitor one (1) or more system components that are not otherwise equipped for addressable communication. Modules shall be used for monitoring of waterflow, valve tamper, non-addressable devices, and for control of evacuation indicating appliances and AHU systems. Provide connection for all devices provided by sprinkler contractor whether indicated on drawings or not.

2. Addressable circuit interface modules will be capable of mounting in a standard electric outlet box. Modules will include cover plates to allow surface or flush mounting. Modules will receive their operating power from the signaling line or separate 2-wire pair running from an appropriate power supply as required.

3. The circuit interface module shall be supervised and uniquely identified by the control unit. Module identification shall be transmitted to the control unit for processing according to the program instructions. Modules shall have an on-board LED to provide an indication that the module is powered and communicating with the FACP. The LEDs shall provide a troubleshooting aid since the LED blinks on poll whenever the peripheral is powered and communicating.

l) Fire Alarm Control Panel (FACP):

1. **General:** Comply with UL 864, “Control Units for Fire-Protective Signaling Systems.”

2. **Cabinet:** Lockable steel enclosure. Arrange unit so all operations required for testing or for normal care and maintenance of the systems are performed from the front of the enclosure. If more than a single unit is required to form a complete control unit, provide exactly matching modular unit enclosures. Accommodate all components and allow ample gutter space for interconnection of
units as well as field wiring. Identify each enclosure by an engraved, red-laminated, phenolic resin nameplate. Lettering on the enclosure nameplate shall not be less than 1-inch high.

3. Systems: Alarm and supervisory systems are separate and independent in the FACP. The alarm-initiating zone boards in the FACP consist of plug-in modules. Construction requiring removal of field wiring for module replacement is not acceptable.

4. Control Modules: Types and capacities required to perform all functions of the fire alarm systems. Local, visible, and audible signals notify of alarm, supervisory, and trouble conditions.

5. Alphanumeric Display and System Controls: Arrange to provide the basic interface between human operator at FACP and addressable system components, including annunciation, supervision, and control. A display with a minimum of 80 characters displays alarm, supervisory, and component status messages and indicates control commands to be entered into the system for control of smoke detector sensitivity and other parameters. Arrange keypad for use in entering and executing control commands.

6. Instructions: Printed or typewritten instruction card mounted behind a LEXAN plastic or glass cover in a painted steel or aluminum frame. Install the frame in a location observable from the FACP. Include interpretation and appropriate response for displays and signals; and briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

7. Addressable Network:
   A. Communication with Addressable Devices: The system must provide communication with initiating and control devices individually. All of these devices will be individually annunciated at the control panel.
   B. All addressable devices shall have the capability of being disabled or enabled individually.

8. Historical event logs shall be available from the LCD display or shall be capable of being printed.

9. Minimum panel capacity shall be 100 addressable devices, with provisions for expansion modules to support existing buildings and future additions.

m) Installation – General:
   1. Install system according to NFPA standards referenced in Parts 1 and 2 of this section.
   2. Fire Alarm Power Supply Disconnect: Shall be painted red and labeled “FIRE ALARM.” Provide with a lockable handle or cover.
   3. All wiring shall be in conduit.

n) Wiring Installation:
   1. Wiring Method: Install wiring in metal raceway according to this specification. Conceal raceway except in unfinished spaces as indicated.
   2. Wiring within Enclosures: Install conductors parallel with or at right angles to the sides and back of the enclosure. Bundle, lace, and train the conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the wiring diagrams of the system. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plugs connectors.
3. Cable Taps: Use numbered terminal strips in junction, pull or outlet boxes, cabinets, or equipment enclosures where any circuit tap is made.

4. System Wiring: Wire and cable shall be a type listed for its intended use by an approval agency acceptable to the authority having jurisdiction and shall be installed in accordance with the appropriate articles from the current approved edition of the National Electric Code (NEC) (NFPA 70).

5. Color Coding: Color-code fire alarm conductors differently from the normal building power wiring. Use one color code for alarm initiating device circuits wiring and a different color code for supervisory circuits. Color-code notification appliance circuits differently from alarm-initiating circuits. Paint fire alarm system junction boxes and covers red.

o) Grounding:

1. Ground equipment and conductor and cable shields as specified by the equipment manufacturer. For audio circuits minimize to the greatest extent possible ground loops, common mode returns, noise pickup, cross talk, and other impairments. Provide 5 ohm ground at main equipment location. Measure, record, and report ground resistance.

p) Field Quality Control:

1. Manufacturer’s Field Services: Provide services of a factory-authorized service representative to supervise the field assembly and connection of components and the pretesting, testing, and adjustment of the system.

2. Pretesting: Upon completing installation of the system, align, adjust, and balance the system and perform complete pretesting. Determine, through pretesting, the conformance of the system to the requirements of the drawings and specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new and retest until satisfactory performance and conditions are achieved. Prepare forms for systematic recording of acceptance test results.

3. Report of Pretesting: After pretesting is complete, provide a letter certifying the installation is complete and fully operable, including the names and titles of the witnesses to the preliminary tests.

4. Final Test Notice: Provide a 10-day minimum notice in writing when the system is ready for final acceptance testing.

5. Minimum Systems Tests: Test the systems according to the procedures outlined in NFPA 72. Minimum required tests are as follows:

   A. Verify the absence of unwanted voltages between circuit conductors and ground.

   B. Megger test all conductors other than those intentionally and permanently grounded with electronic components disconnected. Test for resistance to ground. Report readings less than 1 megohm for evaluation.

   C. Test all conductors for short circuits utilizing an insulation-testing device.

   D. With each circuit pair, short circuit at the far end of the circuit and measure the circuit resistance with an ohmmeter. Record the circuit resistance of each circuit on the record drawings.

   E. Verify the control unit is in the normal condition as detailed in the manufacturer’s operating and maintenance manual.
F. Test initiating, notification, and signaling circuits for proper signal transmission under open circuit conditions. One connection each should be opened at not less than 10 percent of the initiating and notification devices. Observe proper signal transmission according to class of wiring used.

G. Test each initiating device and notification appliance for alarm operation and proper response at the control unit. Test smoke detectors with actual products of combustion.

H. Measure and record the actual current draw of each notification appliance circuit.

I. Test the system for all specified functions according to the manufacturer’s operating and maintenance manual. Systematically initiate specified function performance items at each station including making all possible alarm and monitoring initiations and using all communication options. For each item, observe related performance at all devices required to be affected by the item under all system sequences. Observe indicating lights, displays, signal tones, and annunciator indications.

J. Test both primary power and secondary power. Verify, by test, the secondary power system is capable of operating the system for the period and in the manner specified.

6. Retesting: Correct deficiencies indicated by tests and complete retest work affected by such deficiencies. Verify by the system test that the total system meets the specifications and complies with applicable standards.

7. Report of Tests and Inspections: Provide a written record of inspections, tests, and detailed test results in the form of a test log. Submit log upon the satisfactory completion of tests.

8. Tag all equipment, stations, and other components at which tests have been satisfactorily completed. Final test, certificate of completion, and certificate of occupancy.

9. Test the system as required by the Authority Having Jurisdiction in order to obtain a certificate of occupancy. Demonstrate that the system meets the specifications and complies with applicable standards. This final test shall be witnessed by a representative of the Authority Having Jurisdiction and a factory authorized service representative.

q) Cleaning and Adjusting:

1. Cleaning: Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean unit internally using methods and materials recommended by manufacturer.

2. Occupancy Adjustments: When requested within one-year of date of substantial completion, provide on-site assistance in adjusting sound levels and adjusting controls and sensitivities to suit actual occupied conditions. Provide up to three (3) visits to the site for this purpose.

END OF SECTION 16B