SPENCER COUNTY BOARD OF EDUCATION
OFFICE ADDITION AND RENOVATION

PROJECT MANUAL – VOLUME I

Spencer County Board of Education
Office Additiona and Renovation
SCB 2448 / BG #25-166

February 26, 2025

OWNER
Spencer County Board of Education
Taylorsville, Kentucky

SUPERINTENDENT – Dr. William Foster

ARCHITECT

SHERMAN CARTER BARNHART ARCHITECTS PLLC
144 Turner Commons Way, Suite 110
Lexington, KY 40508
859-224-1351

MECHANICAL / ELECTRICAL / PLUMBING

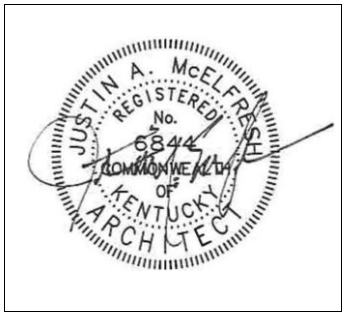
SHROUT TATE WILSON CONSULTING ENGINEERS
628 Winchester Road
Lexington, KY 40505
859-277-8177

CIVIL / LANDSCAPE ARCHITECTURE

SHERMAN CARTER BARNHART ARCHITECTS, PLLC
144 Turner Commons Way, Suite 110
Lexington, KY 40508
859-224-1351

STRUCTURAL

POAGE ENGINEERS & ASSOCIATES, INC.
880 Sparta Court
Lexington, KY 40504
859-255-9034



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Unless noted otherwise, the following shall apply to all manufacturers listed herein. Subject to compliance with Contract Documents, manufactures listed are approved as a manufacturer only. This does not imply that specific products supplied by such manufacturers have been reviewed and comply with requirements. It shall be the manufacturer's / contractor's responsibility to ensure that <u>all</u> requirements of the Contract Documents are met.

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 001113 - ADVERTISEMENT FOR BIDS

PART 1 - Advertisement for Bids

1.1 PROJECT INFORMATION

A. Notice to Bidders: Qualified bidders may submit bids for the project as described in this Document. Submit bids according to the Instructions to Bidders.

B. Project Identification: Spencer County Board of Education Office Addition / Renovation, and New Parking Lot

1. Project Location: 110 Reasor Avenue, Taylorsville, KY 40071

C. Owner: Spencer County Board of Education, 110 Reasor Ave., Taylorsville, KY 40071

D. Architect: Sherman Carter Barnhart Architects, Tom Smith, AIA
P - 859-224-1351, tsmith@scbarchitects.com

E. Project Description: Entry, vestibule, and office addition the existing board office with new metal wall panel and standing seam roofing and limited interior renovations.

F. Construction cost of the project is estimated to be $1.3 million.

G. Construction Contract: Bids will be received for the following Work:

1. General Contract (all trades).

1.2 BID SUBMITTAL AND OPENING

A. Owner will receive sealed lump sum bids until the bid time and date at the location given below. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:

1. Bid Date: **April 10, 2025**
2. Bid Time: **2pm local time**
3. Bid Location: **Spencer Co. Board of Education**
110 Reasor Ave.
Taylorsville, KY 40071

4. If bids are to be mailed, address to: **Dr. Willie Foster, Superintendent**
Spencer County Schools
110 Reasor Ave.
Taylorsville, KY 40071

B. Bids will be thereafter publicly opened and read aloud.

1.3 BID SECURITY

A. Bid security shall be submitted with each bid in the amount of 5 percent of the bid amount. No bids may be withdrawn for a period of 60 days after opening of bids. Owner reserves the right to reject any and all bids and to waive informalities and irregularities. Bids received after the scheduled closing time for the receipt of bids will be returned unopened to the bidders. Any bids not submitted on the proper form shall not be considered.

1.4 PREBID MEETING

A. Prebid Meeting: The Prebid Meeting will be held on March 27, 2025 at Spencer County Board of Education, 110 Reasor Avenue, Taylorsville, KY 40071.

B. Printed Procurement and Contracting Documents: Obtain by contacting Lynn Imaging.

1. Free downloads through Lynn Imaging plan room online at www.lynnimaging.com

1.5 TIME OF COMPLETION AND LIQUIDATED DAMAGES

A. Successful bidder shall begin the Work on receipt of the Notice to Proceed and shall complete the Work within the Contract Time. Work is subject to liquidated damages.

1.6 BIDDER'S QUALIFICATIONS

A. Successful bidders will be required to furnish and pay for satisfactory Performance and Labor and Material Payment Bonds. The bond shall cover the entire base bid cost and any accepted alternates.

B. Prevailing wage rates **will not** apply to this project.

END OF SECTION 001113

SECTION 001115 – LIST OF DRAWING SHEETS

PART 1 – LIST OF DRAWING SHEETS

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SD-1.0 SITE DEVELOPMENT PLAN

SD2.0 SITE GRADING AND DRAINAGE PLAN

SD2.1 EROSION AND SEDIMENT CONTROL PLAN

SD3.0 SITE DETAILS

SD4.0 SITE DETAILS

SD4.1 SITE DETAILS

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S0.1 STRUCTURAL NOTES

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S1.2 ADMIN. BUILDING VESTIBULE ROOF FRAMING PLAN

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END OF SECTION 001115

Kentucky Department of Education Version of AIA® Document A701™ – 1997

Instructions to Bidders

This version of AIA Document A701™–1997 is modified by the Kentucky Department of Education. Publication of this version of AIA Document A701–1997 does not imply the American Institute of Architects' endorsement of any modification by the Kentucky Department of Education. A comparative version of AIA Document A701–1997 showing additions and deletions by the Kentucky Department of Education is available for review on the Kentucky Department of Education Web site.

Cite this document as "AIA Document A701™– 1997, Instructions to Bidders — KDE Version," or "AIA Document A701™–1997 — KDE Version."

Kentucky Department of Education Version of AIA® Document A701™ – 1997

Instructions to Bidders

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

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

This version of AIA Document A701–1997 is modified by the Kentucky Department of Education. Publication of this version of AIA Document A701 does not imply the American Institute of Architects' endorsement of any modification by the Kentucky Department of Education. A comparative version of AIA Document A701–1997 showing additions and deletions by the Kentucky Department of Education is available for review on the Kentucky Department of Education Web site.

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

TABLE OF ARTICLES

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 Form of Proposal 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. The Base Bid shall include all labor, material, bonds, and the cost of all direct purchase orders for material to be purchased by the Owner

§ 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.

1. The submission of a Bid will be construed as evidence that a site visit and examination of local conditions have been made. Later claims for labor, equipment, or materials required or difficulties encountered which could have been foreseen had such an examination been made will not be recognized.

§ 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 (Not Used)

§ 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 and Construction Manager (if utilized) 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 and Construction Manager (if utilized) 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 Architect and Construction Manager (if utilized) 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 Form of Proposal 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 Form of Proposal 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 greater ~~than $25,000~~ than $100,000.00 shall be accompanied by bid security in the form of a Bond provided by a Surety Company authorized to do business in the Commonwealth of Kentucky, or in the form of a certified check, and in an amount equal to at least five percent (5%) of the Base Bid amount, pledging that the Bidder will 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 payments 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. **(Refer to attached KDE Directions on KDE Version of AIA Document AIA 701-1997 Instruction to Bidders June 3, 2017)**

§ 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 as indicated in the Advertisement or Invitation to Bid or any extensions thereof made by Addendum. Bids received after the closing time and date for receipt and opening of Bids will be rejected and returned to the Bidder 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.

§ 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) [Reference: KRS 45A.365]

§ 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

§ 6.1.1 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.

§ 6.1.2 In determining the qualifications and responsibilities of the Bidder, the Owner shall take into consideration the Bidder's skill**,** experience, facility, previous work standing, financial standing, capacity and ability to handle work in addition to that in progress, and quality and efficiency of construction plant and equipment proposed to be used on the project.

§ 6.2 (Not Used)

§ 6.3 Submittals

§ 6.3.1 Each Bidder shall submit as part of the Form of Proposal a list of subcontractors proposed for each major branch of work itemized and described in the specifications for the Project. The Bidder's listing of a subcontractor for a work category certifies that the subcontractor has in current employment, skilled staff and necessary equipment to complete that category. The Architect and Construction Manager (if utilized) will evaluate the ability of all listed subcontractors to complete the work and notify the Owner. Listing of the Bidder as the subcontractor may invalidate the Bid should the Architect's and Construction Manager's (if utilized) review indicate the bidder does not have skilled staff and equipment to complete the work category at the time the Bid was submitted.

.1 Changing subcontractors from those listed with the Form of Proposal is prohibited unless the bidder provides grounds for such a change that are consistent with provisions of the Instructions to Bidders. Said change shall be accompanied by a written explanation from the Bidder as well as a written release from the listed subcontractor. All letters shall be on original company stationary with original signatures from an officer in the company legally approved to act for the company. An unjustifiable change of subcontractors may invalidate the Bid. Any change to a proposed person or entity shall be addressed as noted in Section 6.3.3 of these Instructions to Bidders

§ 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.

§ 6.4 List of Materials, Suppliers, and Manufacturers

§ 6.4.1 Each Bidder shall submit a complete list of materials/equipment with supplier's and manufacturer's name in the form and manner indicated on the Form of Proposal and in compliance with materials and equipment specified.

§ 6.4.2 In addition to the list furnished with the Form of Proposal, the successful Bidder thereafter known as the Contractor, may be requested within thirty (30) calendar days after award of contract to furnish to the Architect and Construction Manager (if utilized) a more detailed and complete list of the materials and equipment, together with the manufacturer's or maker's name, brand and/or catalogue number, and product data or illustration thereof.

§ 6.4.3 Prior to the award of contract, the Architect and Construction Manager (if utilized) will make a preliminary check of the lists included with the Form of Proposal and advise the Bidder and the Owner of the acceptance thereof, and of such other actions as may be necessary in order to meet the requirements of the contract specifications. Should it develop that any of the materials or equipment named in the list do not meet the requirements of the project specifications, the Bidder shall be required to offer to the Owner other materials or equipment in compliance with the specifications at no change in contract price. Preliminary review and acceptance of the above list shall not relieve the Contractor of furnishing equipment and materials in accordance with the specifications.

§ 6.4.4 Written approval shall be obtained from the Architect regarding any material/equipment, supplier, and manufacturer substitution. Substitutions are permitted in the following instance:

.1 Failure to comply with contract requirements;
.2 Failure of the supplier or manufacturer to meet delivery schedules or other conditions of the contract;
.3 Written release by the supplier or manufacturer.

§ 6.4.5 The Owner reserves the right to reject the bid of any Bidder who fails to furnish the information required under Sections 6.3 and 6.4.

§ 6.5 Unit Prices

§ 6.5.1 Each Bidder shall submit as part of the Bid a list of unit prices as designated on the Form of Proposal.

§ 6.5.2 Unit prices are for changing or adjusting the scope or quantity of work from that indicated by the contract drawings and specifications.

§ 6.5.3 Unit prices shall include all labor, materials, equipment, appliances, supplies, overhead and profit.

§ 6.5.4 Only a single unit price per item shall be given and it shall apply for either more or less work than indicated or specified in the contract documents. In the event the contract is adjusted by unit prices, a change order shall be issued for the change and for the increased or decreased amount.

§ 6.5.5 Unit prices listed by the Bidder and accepted by the Owner shall apply to all phases of work whether the work is performed by the Bidder or by the Bidder's (Contractor's) subcontractors.

§ 6.5.6 For unit prices that apply to a lump sum Base Bid, the Owner reserves the right, prior to an award of contract, to negotiate, adjust and/or reject any price that is determined by the Architect, Construction Manager, or Owner to be excessive or unreasonable in amount.

§ 6.5.7 On line item total sum bids where Bidders are quoting firm unit prices for estimated quantities of units of work, the unit price is the Bid and is not subject to change, either by the Bidder or Owner. The Owner reserves the right to correct mathematical errors in extensions and additions by the Bidder. The Owner's corrected bid sum total shall take preference over the Bidder's computed bid sum total.

§ 6.6 Bid Division, Material Suppliers, and Purchase Orders

§ 6.6.1 This Section applies to projects with or without Bid Division (Multiple Prime Contracts), and those Projects that provide for direct purchase by the Owner of materials and equipment from Material Suppliers.

§ 6.6.2 For Projects with Bid Division: General Construction and Concrete, Masonry, Plumbing, HVAC and Electrical Contractors shall provide with their Bid a breakdown of major material items (excluding sales tax). This breakdown shall include description of the item, name of the manufacturer, name of the supplier, and the amount of the supplier's quote. The Owner will issue Purchase Orders direct to the suppliers for these materials. The following shall be provided:

.1 Within four (4) days from the Bid Date, the low Bidder shall furnish to the Owner the list of material suppliers of the items listed on the bid breakdown, with authorization given to the Contractor to quote the materials listed and that the Supplier will furnish the listed materials to the Owner under the Owner's standard Purchase Order for the amount stated on the Contractor's bid breakdown. Failure of any Contractor to provide this written list of material suppliers with authorization will cause forfeiture of the bid security.

.2 The Contractor shall also guarantee to the Owner that materials listed in the breakdown to be purchased directly by the Owner shall comply with requirements of the Contract Documents and that the quantity of such material is sufficient to complete the Bid Division. The Performance and Payment Bonds required of the Contractor shall be in the combined amount of the materials designated in its bid to be acquired by Purchase Order by the Owner and all remaining items of cost in the respective Bid Division. Contractor shall provide an invoice from the supplier to the Owner with Contractor's Application for Payment.

.3 Material Suppliers will be paid the full amount of their invoices. Retainage that would otherwise be withheld from invoices submitted by and paid to a material supplier shall be withheld from the approved payment request of the Contractor. Refer to General Conditions for further requirements regarding retainage.

.a Lockers, Library, Kitchen, Shop, Technology, Science or other major equipment bid divisions shall provide with their Bid a breakout price for the material portions of the Bid (excluding sales tax). Award of contract will be based on the lump sum price of the accepted Bid that includes labor and materials. The Owner will issue a Purchase Order for the material and a contract for the labor and incidental materials. Retainage will be held on both the Purchase Order and the Contract in accordance with the General Conditions.

.b The language of the Bid Divisions is designed to outline and define the work in general to be included in a particular Bid Division and to prevent overlapping and conflicting requirements within other Bid Divisions. No Bidder shall use the omission of any item from this language as a basis for a claim for additional cost when such item is specified or indicated to be part of a complete and workable system.

.c It is the responsibility of the Bidder to determine which Bid Division or combination of Bid Divisions the Bidder desires to Bid.

§ 6.6.3 For Projects without Bid Division but with direct purchase by the Owner of materials and equipment from Material Suppliers, Contractors shall comply with paragraph 6.6.2 above as applicable to the Project. The Owner will issue Purchase Orders direct to the suppliers for these materials. Award of contract will be based on the lump sum price of the accepted bid that includes labor and materials. Retainage will be held on both the Purchase Orders and the Contract(s) in accordance with the General Conditions.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 Unless stipulated otherwise in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds shall be executed by a surety company authorized to do business in Kentucky.

§ 7.1.2 The cost of such bonds 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.

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312™–2010, Performance Bond and Payment Bond — KDE Version. Both bonds shall be written in the amount of the Contract Sum, being the total of the Base Bid, as described in Section 1.5 herein, and all Alternates accepted by the Owner.

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

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

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101™–2007, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum — KDE Version, except for those Projects utilizing a Construction Manager the Agreement will be written on AIA Document A132™–2009, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Advisor Edition — KDE Version. Owner-Contractor Agreements shall be valid only after written notice by the Kentucky Department of Education that the proposed Agreements are approved.

~~ARTICLE 9 PUBLIC WORKS ACT [Reference: KRS 337.505 to 337.550]~~

§ 9.1 Labor Regulations **(Refer to attached KDE Directions Delete 9.1.1 and 9.1.2**

~~§ 9.1.1 Work shall be performed in compliance with applicable provisions of the Kentucky Prevailing Wage Act on Public Works Projects, KRS 337.505 through KRS 337.550.~~

~~§ 9.1.2 Prevailing wage rates, included with the Bidding Documents, shall be paid on this Project if required under Section 10.1.1. The stipulated wage rates represent prevailing minimum wage rates of pay allowable and shall not be construed to mean that higher rates may not have to be paid in order to secure labor.~~

§ 9.1.3 Any Bidder and/or subcontract bidder in violation of any wage or work act provision (KRS 337.510 to KRS 337.550) and under citation by the Kentucky Department of Labor is prohibited by KRS 337.990 from bidding on or working on any and all public works contracts either in their name or in the name of any other company, firm, or other entity in which there is vested interest. No Bid shall be submitted by a prime Bidder or sub-bidder in violation of KRS Chapter 337. The responsibility of the qualifications of the sub-contract Bidder is solely that of the prime Bidder. The rejection of the subcontract Bidder and resubmittal of a qualified subcontract Bidder shall be addressed per the provisions of these Instructions to Bidders relating to subcontract Bidders (subcontractors) and materials.

§ 9.2 Davis-Bacon Act Provisions

Projects funded with Federal Funds shall comply with the Davis-Bacon Act (Subchapter IV of Chapter 31 of the Title 40 of the United States Code). Where the amount received from federal revenue sharing is less than 25 percent of the estimated total construction cost of a public school project, state law and not the federal applies to the wage rate and the prevailing wage scale to be used for the project (OAG 74-329). Refer to Supplementary Conditions for direction regarding application of federal rates, if included in the bidding documents, to this project. In the event both state and federal wage rates apply, the higher of the two rates shall be used to determine labor costs.

ARTICLE 10 TAXES

§ 10.1 Kentucky Sales and/or Use Tax [Reference KRS 139.495(1)]

Bidders are informed that construction contracts of the Commonwealth of Kentucky and political subdivisions are not exempt from the provisions of the Kentucky Sales and/or Use Tax, unless provisions are clearly noted in the bidding documents for the direct purchase of certain materials and equipment by the Owner. Materials and equipment which are to be submitted for direct purchase are as noted by the Architect or Construction Manager in the Form of Proposal and shall be limited to forty (40) items with a minimum price of $5,000 each. All other materials and equipment shall be included in the Contract Price and are subject to Kentucky Sales and/or Use Taxes. Current Sales and/or Use Tax shall be provided for and included in the bid amount as no adjustment will be permitted nor made after the receipt of bids.

§ 10.2 Federal Excise Tax

The Commonwealth of Kentucky and its political subdivisions are exempt from Federal Excise Tax.

ARTICLE 11 POST BID REVIEW AND MATERIAL SUBMITTAL

§ 11.1 Representative at Bid Opening

§ 11.1.1 Each prime Bidder shall have an authorized representative at the bid opening for submittal of the list of materials and equipment, and the post bid review which follows immediately after the opening and reading of bids.

§ 11.1.2 Following the opening of bids, the three (3) apparent low Bidders shall remain for a post-bid review, and shall submit a completed list of materials, equipment and suppliers within one (1) hour from the close of the reading of the bids. The list of materials and equipment shall be the listing contained in the Form of Proposal.

§ 11.1.3 The post bid review, open to all bidders, will be conducted jointly with representatives of the Architect and Construction Manager (if utilized), Owner, and apparent low Bidder. Preliminary review will be directed toward Bidder's qualifications, list of subcontractors, list of materials and equipment, and unit prices.

ARTICLE 12 EQUAL EMPLOYMENT AND NONDISCRIMINATION

The Commonwealth of Kentucky and its political subdivisions are committed to equal job opportunities on public contracts and prohibited from discrimination based on race, creed, color, sex, age, religion, or national origin.

ARTICLE 13 CONFLICT OF INTEREST, GRATUITIES AND KICKBACKS, USE OF CONFIDENTIAL INFORMATION [Reference KRS 45A.455]

Conflict of Interest, Gratuities, Kickbacks, and Use of Confidential Information as described in KRS 45A.455 are expressly prohibited. Penalties for any violation under this statute are located in KRS 45A.990.

ARTICLE 14 KENTUCKY FAIRNESS IN CONSTRUCTION ACT OF 2007 [Reference KRS 371.400 to 371.425]

Projects constructed for school districts in the Commonwealth of Kentucky are subject to provisions of the Kentucky Fairness in Construction Act of 2007 as it relates to the right to litigate, the right to delay damages against the Owner, the right to file a mechanic's lien, prompt payment by Owners, amount of retainage that can be withheld and other provisions of the Act.

ARTICLE 15 KENTUCKY PREFERENCE LAW [Reference KRS 45A.490 to 45A.494]

§ 15.1 Projects constructed for school districts in the Commonwealth of Kentucky are subject to provisions of the reciprocal preference for Kentucky Preference for Resident Bidders law, KRS 45A.490 to KRS 45A.494. Reciprocal preference shall be given by public agencies to resident bidders.

§ 15.2 The Kentucky Finance and Administration Cabinet shall maintain a list of states that give to or require a preference for their own resident bidders, including details of the preference given to such bidders, to be used by public agencies in determining resident bidder preferences. The cabinet shall also promulgate administrative regulations in accordance with KRS Chapter 13A establishing the procedure by which the preferences required by this Section shall be given.

§ 15.3 The reciprocal preference as described in KRS 45A.490 to KRS 45A.494 above shall be applied in accordance with Kentucky Administrative Regulation 200 KAR 5:400.

KDE Directions on
Kentucky Department of Education Version of
AIA Document A701 – 1997
Instructions to Bidders
February 20, 2017

Modify Article 9 as follows:

Delete 9.1.1.
Delete 9.1.2.

KDE Directions on
Kentucky Department of Education Version of
AIA Document A701 – 1997
Instructions to Bidders
June 3, 2017

Modify Article 4 BIDDING PROCEDURES, Paragraph 4.2 Bid Security, Subparagraph 4.2.1 as follows:

"4.2.1 Each Bid greater than **$100,000** shall be accompanied by bid security in the form of a Bond provided by a Surety company authorized to do business in the Commonwealth of Kentucky, or in the form of a certified check, and in an amount equal to at least five percent (5%) of the Base Bid amount, pledging that the Bidder will 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 payments 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."

SECTION 002213 - SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

PART 1 - Supplementary Instructions to Bidders

1.1 INSTRUCTIONS TO BIDDERS

A. Instructions to Bidders for Project consist of the following:

1. AIA Document A701, "Instructions to Bidders," (KDE Version) a copy of which is bound in this Project Manual.
2. The following Supplementary Instructions to Bidders that modify and add to the requirements of the Instructions to Bidders.

1.2 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS, GENERAL

A. The following Supplementary Instructions to Bidders modify or add to the AIA Document A701-1997 INSTRUCTIONS TO BIDDERS (KDE Version). Where any Article of the Instructions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

1.3 ARTICLE 1 - DEFINITIONS

A. Add Section 1.10.

1. 1.10 - A Material Supplier is the person or entity who has a direct contractual responsibility to the Owner to furnish designated materials described within the Bid Package Summary in accordance with governing provisions of the Contract.

1.4 ARTICLE 2 - BIDDER'S REPRESENTATIONS

A. Add Section 2.1.3.2:

1. 2.1.3.2 - The Bidder has investigated all required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted bid the cost of such fees, permits, and requirements not otherwise indicated as provided by Owner.

B. Add Section 2.1.5:

1. 2.1.5 - The Bidder has incorporated into the Bid adequate sums for work performed by installers whose qualifications meet those indicated in the Procurement and Contracting Documents.

1.5 ARTICLE 3 - BIDDING DOCUMENTS

A. 3.2 - Interpretation or Correction of Procurement and Contracting Documents:

1. Add Section 3.2.2.1:

a. 3.2.2.1 - Submit Bidder's Requests for Interpretation using form bound in the Project Manual.

2. Add the Section 3.2.4:

a. 3.2.4 - WORK REASONABLY INFERRED, BUT NOT PARTICULARLY DELINEATED OR SPECIFIED: The Contractor shall study all drawings and specifications and all conditions relating to the erection of the work, and if any materials or labor evidently necessary for the proper and complete execution of the work, which are not specifically mentioned and included in the drawings and specifications, although reasonably inferred therefrom, unless eliminated by special mention, or if any error or inconsistency appears therein, or in the event of a doubt arising as to the true intent and meaning of the drawings or specifications, he shall report it to the Architect at least ten (10) days in advance of the date for receiving the bid. The Architect will then issue an addendum containing the proper information to all Contractors, to assure fair competition. In case the Contractor fails to make such report and the Architect is not otherwise advised of such doubtful matter, the Contractor is hereby made responsible for the furnishing of the necessary labor and material reasonable inferred or evidently necessary for the proper execution and completion of the work; for any additional work involved in the correction of apparent errors or inconsistencies and in executing the true extent and meaning of the drawings and specifications as interpreted by the Architect, and all such labor and materials shall be provided at the Contractor's expense and under no condition will any such labor and material be allowed as an extra.

3. Add Section 3.2.5:

a. 3.2.5 - DISCREPANCIES: Anything called for in the specifications and not shown on the drawings or shown on the drawings and not called for in the specifications shall be included in both. Where the details and general drawings do not agree, the Contractor shall notify the Architect at least five (5) days before the date of the receipt of bids and the Architect will issue an Addendum to all Contractors as to which of the two methods of construction shall be followed. Failure to make this determination shall make the Contractor subject to furnishing either method as may be later called for by the Architect. In case of discrepancies between the various parts of the plans and specifications. The Contractor shall furnish either method as may be determined by the Architect.

B. 3.4 - Addenda:

1. Add Section 3.4.5:

a. 3.4.5 - Examine bidding documents carefully prior to date for receipt of bids, make written request to Architect for true meaning of any part of contract documents, for interpretation and correction of any ambiguity, inconsistency or error therein. All interpretations and corrections will be included in an addendum issued by Architect. Contractor's written questions can be sent by photo facsimile to **Tom Smith, AIA** at Sherman Carter Barnhart Architects (859) 224-8446 or by email at tsmith@scbarchitects.com for interpretation up to and through **seven days prior to bid submission date**. Only a written interpretation or correction by addendum shall be binding. No Bidder shall reply upon interpretations or corrections given by any other method.

1.6 ARTICLE 6 - POSTBID INFORMATION

A. 6.3 - Submittals

1. Add Section 6.3.1.2:

a. 6.3.1.2 - The listing of more than one subcontractor in a work category shall invalidate bid.

1.7 ARTICLE 8 – FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

A. Add the following Sections:

1. 8.1 - Subsequent to the Notice of Intent to Award, and within 10 days after the prescribed Form of Agreement is presented to the Awardee for signature, the Awardee shall execute and deliver the Agreement to Owner through Architect, in such number of counterparts as Owner may require.
2. 8.2 - Owner may deem as a default the failure of the Awardee to execute the Contract and to supply the required bonds when the Agreement is presented for signature within the period of time allowed.
3. 8.3 - Unless otherwise indicated in the Procurement and Contracting Documents or the executed Agreement, the date of commencement of the Work shall be the date of the executed Agreement.
4. 8.4 - In the event of a default, Owner may declare the amount of the Bid security forfeited and elect to either award the Contract to the next responsible bidder or re-advertise for bids.

This is for TAX EXEMPT ONLY

1.8 ARTICLE 10 - TAXES

A. 10.1 Kentucky Sales and Or Use Tax

1. Add the following Sections:

a. 10.1.1 - As provided by KRS 139.3 10 and Kentucky Administrative Regulation 103, AR26:070 Contract Construction. Each Contractor is responsible for Kentucky Sales Tax and Use Tax on all materials purchased and installed by Contractor or a third party hired by the Contractor. For those bid packages identified as supplier only or contractor/supplier (containing bid breakout items) the sales and use taxes to be excluded only on those material items purchased by the Owner directly from the material supplier. If a Contactor lists his own company as the supplier on those bid packages containing bid breakout items, the Owner will not issue a purchase order and exemption certificate. Accordingly, the sales and use tax on the materials used to fulfill the terms of the Contract will be the liability of the Contractor.

b. 10.1.2 - The material breakout amount indicated by the perspective bidder on the bid form is considered final. The KDE material supplier authorization form stipulates the cost of the material is validated by the signature of the supplier. In order to qualify for tax exemption, the Revenue Cabinet requires that the bid for the labor component and material component for a given bid package remains separate. However, upon completion of the project, if the Contractor has not submitted invoices totaling the value of a purchase order, that purchase order shall be considered complete and closed, with the balance left in the purchase order reverting to the Owner.

END OF SECTION 002213

SECTION 002600 - PROCUREMENT SUBSTITUTION PROCEDURES

PART 1 - Procurement Substitution Procedures

1.1 DEFINITIONS

A. Procurement Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted prior to receipt of bids.

B. Substitution Requests: Requests for changes in products, materials, equipment, and methods of construction from those indicated in the Contract Documents, submitted following Contract award. See Section 012500 "Substitution Procedures" for conditions under which Substitution requests will be considered following Contract award.

1.2 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.3 PROCUREMENT SUBSTITUTIONS

A. Procurement Substitutions, General: By submitting a bid, the Bidder represents that its bid is based on materials and equipment described in the Procurement and Contracting Documents, including Addenda. Bidders are encouraged to request approval of qualifying substitute materials and equipment when the Specifications Sections list materials and equipment by product or manufacturer name.

B. Procurement Substitution Requests will be received and considered by Owner when the following conditions are satisfied, as determined by Architect; otherwise requests will be returned without action:
   1. Extensive revisions to the Contract Documents are not required.
   2. Proposed changes are in keeping with the general intent of the Contract Documents, including the level of quality of the Work represented by the requirements therein.
   3. The request is fully documented and properly submitted.

1.4 SUBMITTALS

A. Procurement Substitution Request: Submit to Architect. Procurement Substitution Request must be made in writing in compliance with the following requirements:
   1. Requests for substitution of materials and equipment will be considered if received no later than 10 days prior to date of bid opening.
   2. Requests for substitution of materials and equipment must be accompanied by the Product Substitution Form at the end of this section.

B. Architect's Action:
   1. Architect may request additional information or documentation necessary for evaluation of the Procurement Substitution Request. Architect will notify all bidders of acceptance of the proposed substitute by means of an Addendum to the Contract Documents.

C. Architect's approval of a substitute during bidding does not relieve Contractor of the responsibility to submit required shop drawings and to comply with all other requirements of the Contract Documents.

END OF SECTION 002600

CERTIFICATE OF PRODUCT COMPLIANCE FOR
PROPOSED SUBSTITUTED PRODUCTS

To: Sherman Carter Barnhart Architects, PLLC
Tom Smith, AIA
tsmith@scbarchitects.com
144 Turner Commons Way, Suite 110
Lexington, KY 40508
Phone (859) 224-1351
Fax (859) 224-8446

I, _____, being a duly authorized representative of
(Name)

_____, the manufacturer, and/or distributor, and/or sales
(Company Name)

representative of _____, do hereby certify that the above named
(Product Name)

product complies in strict accordance with the Contract Documents and Specifications for the

construction of _____ located in
(Project Name)

_____ and that the product is compatible and fit for the
(Project Address)

intended use and incorporation into this project. Further, I understand that the Architect and

Owner may rely on this certification.

Submittal of this form is not intended to be considered a formal approval of proposed

substitution. All approved substitutions prior to bid must be incorporated into Contract

Documents via formal addenda. Substitution requests made during construction shall be

submitted for approval per Specification Section 012500. Approval or substitution requests via

Specification Sections 002600 and 012500 do not imply that specific products supplied by such

manufacturers have been reviewed and comply with requirements. It shall be the

manufacturer's / contractor's responsibility to ensure that all requirements of the Contract

Documents are met.

Signature:_____ Date:_____

KENTUCKY DEPARTMENT OF EDUCATION **FORM OF PROPOSAL**
702 KAR 4:160

BG No. **24-166**

Date: To: (Owner) Spencer County Board of Education

Project Name: Spencer County Board of Education Office Addition and Renovation Bid Package No. _____

City, County: Taylorsville, Spencer

Name of Contractor: _____

Mailing Address: _____

Business Address: _____Telephone:_____

Having carefully examined the Instructions to Bidders, Contract Agreement, General Conditions, Supplemental Conditions, Specifications, and Drawings, for the above referenced project, the undersigned bidder proposes to furnish all labor, materials, equipment, tools, supplies, and temporary devices required to complete the work in accordance with the contract documents and any addenda listed below for the price stated herein.

Addendum _____ (Insert the addendum numbers received or the word "none" if no addendum received.)

BASE BID: For the construction required to complete the work, in accordance with the contract documents, I/We submit the following lump sum price of:

_____
Use Figures

_____ Dollars & _____Cents
Use Words for both dollars and cents

ALTERNATE BIDS: (If applicable and denoted in the Bidding Documents)

For omission from or addition to those items, services, or construction specified in Bidding Documents by alternate number, the following lump sum price will be added or deducted from the base bid.

Alternate Bid No.	**Alternate Description**	**+ (Add to the Base Bid)**	**- (Deduct from the Base Bid)**	**No Cost Change** (from the Base Bid)
Alt. Bid No. 1	Owner-Preferred Lighting Controls Mfr.			
Alt. Bid No. 2	Work in Right of Way			
Alt. Bid No. 3				
Alt. Bid No. 4				
Alt. Bid No. 5				
Alt. Bid No. 6				
Alt. Bid No. 7				
Alt. Bid No. 8				
Alt. Bid No. 9				
Alt. Bid No. 10				

A maximum of 10 Alternate Bids will be acceptable with each Base Bid. Do not add supplemental sheets for Alternate Bids to this document.

LIST OF PROPOSED SUBCONTRACTORS:
List on the lines below each major branch of work and the subcontractor involved with that portion of work. If the branch of work is to be done by the Contractor, so indicate.

The listing of more than one subcontractor in a work category shall invalidate the bid.

The listing of the bidder as the subcontractor for a work category certifies that the bidder has in current employment, skilled staff and necessary equipment to complete that category. The architect/engineer will evaluate the ability of all listed subcontractors to complete the work and notify the owner. Listing of the bidder as the subcontractor may invalidate the bid should the architect's review indicate bidder does not have skilled staff and equipment to complete the work category at the time the bid was submitted.

A maximum of 40 subcontractors will be acceptable with each bid. Do not add supplemental sheets for subcontractors to this document.

The bidder shall submit the list of subcontractors with the bid.

	BRANCH OF WORK (to be filled out by the Architect)	**SUBCONTRACTOR** (to be filled out by the contractor)
1.	Earthwork	
2.	Paving (Concrete)	
3.	Paving (Asphalt)	
4.	Concrete	
5.	Steel	
6.	Wood Trusses	
7.	Masonry	
8.	Aluminum Store Fronts	
9.	Wood Doors	
10.	Door Hardware	
11.	Hollow Metal Frames	
12.	Transaction Windows with Deal Trays	
13.	Windows	
14.	Metal Wall Panels	
15.	Rigid Insulation	
16.	Roofing	
17.	Sheet Metal	

	BRANCH OF WORK (to be filled out by the Architect)	**SUBCONTRACTOR** (to be filled out by the Contractor)
18.	Snow Guards	
19.	Canopies	
20.	Painting	
21.	Safety & Security Impact Film	
22.	Suspended Acoustical Ceilings	
23.	Luxury Vinyl Tile	
24.	Resinous Flooring and Base	
25.	Panels and Signs	
26.	Storm Sewer	
27.	Plumbing	
28.	Safety & Security Systems	
29.	Electrical	
30.	Insulation	

LIST OF PROPOSED SUPPLIERS AND MANUFACTURERS:

List on the lines below each major material category for this project and the suppliers and manufacturers involved with that portion of work. Listing the supplier below means the Contractor is acknowledging authorization from the Supplier to include the Supplier in this bid.

The listing of more than one supplier or manufacturer in a material category shall invalidate the bid.

A maximum of 40 suppliers and manufacturers will be acceptable with each bid. Do not add supplemental sheets for suppliers to this document.

The bidder shall submit the list of suppliers and manufacturers within one (1) hour of the bid.

	MATERIAL DESCRIPTION BY SPECIFICATION DIVISION AND CATEGORY (to be filled out by the Architect or Contractor)	**SUPPLIER** (to be filled out by the Contractor)	**MANUFACTURER** (to be filled out by the Contractor)
1.	Wood Doors		
2.	Hollow Metal Frames		
3.	Door Hardware		
4.	Suspended Acoustical Ceilings		
5.	Dimensional Letters		
6.	Luxury Vinyl Tile		
7.	Paint		
8.	Safety & Security Impact Film		
9.	Resinous FLooring		
10.	Water Closets		
11.	Flush Valves		
12.	Lavatories		
13.	Faucets		
14.	Water Heaters		
15.	Recirculation Pumps		
16.	Light Fixtures & Controls		
17.	Panelboards / Switchboards / Transformers		
18.	Fire Alarm System		

	MATERIAL DESCRIPTION BY SPECIFICATION DIVISION AND CATEGORY (to be filled out by the Architect or Contractor)	**SUPPLIER** (to be filled out by the Contractor)	**MANUFACTURER** (to be filled out by the Contractor)
19.	Panel Signs		
20.	Split Face CMU		
21.	Roof Decking		
22.	Ice and Water Guard Membrane		
23.	Metal Roofing		
24.	Soffits (at Eave)		
25.	Metal Wall Panels		
26.	Snow Guards		
27.	Rigid Insulation		
28.	Blown In Insulation		
29.	Windows		
30.	Storefronts		
31.	Transaction Window With Deal Trays		
32.			
33.			
34.			
35.			
36.			
37.			
38.			
39.			
40.			

UNIT PRICES:

Indicate on the lines below those unit prices to determine any adjustment to the contract price due to changes in work or extra work performed under this contract. The unit prices shall include the furnishing of all labor and materials, cost of all items, and overhead and profit for the Contractor, as well as any subcontractor involved. These unit prices shall be listed in units of work.

A maximum of 40 unit prices will be acceptable with each bid. Do not add supplemental sheets for unit pricing to this document.

The bidder shall submit the list of unit prices within one (1) hour of the bid.

	WORK (to be filled out by the Architect)	**PRICE / UNIT** (to be filled out by the Contractor)	**UNIT** (to be filled out by the Contractor)
1.	Luxury Vinyl Tile Flooring		_____SF
2.	Rubber Base		_____LF
3.	Resinous Flooring (Including Base)		_____SF
4.	Interior Paint		_____SF
5.	Safety & Security Impact Film		_____SF
6.	Toilet Accessories		_____EA
7.	Suspended Acoustical Ceiling System		_____SF
8.	SCWD Type 'N' Door (Incl. Hardware)		_____EA
9.	Transaction Window With Deal Tray		_____EA
10.	2-1/2" Domestic Water Piping Installed and Insulated		_____LF
11.	2" Domestic Water Piping Installed and Insulated		_____LF
12.	1-1/2" Domestic Water Piping Installed and Insulated		_____LF
13.	1" Domestic Water Piping Installed and Insulated		_____LF
14.	3/4" Domestic Water Piping Installed and Insulated		_____LF
15.	4" Sanitary Sewer DWV Installed 48" Under Slab, Excavation & Backfill		_____LF
16.	4" Sanitary Sewer DWV, with Hangers Installed		_____LF
17.	3/4-inch EMT Conduit - Installed		_____LF
18.	1-inch EMT Conduit – Installed		_____LF
19.	3 #12 Conductor – Installed in Conduit		_____LF

	WORK (to be filled out by the Architect)	**PRICE / UNIT** (to be filled out by the Contractor)	**UNIT** (to be filled out by the Contractor)
20.	Duplex Receptacle – Installed		_____EA
21.	Duct Mounted Smoke Detector – Installed		_____EA
22.	Light Fixture – Type A – Installed		_____EA
23.	Exit Sign – Type E - Installed		_____EA
24.	Panel Sign with Braille		_____EA
25.	Remove, Dispose Off-Site and Replace Unsuitable Soils w/ DGA		_____CY
26.	Remove Dispose Off-Site and Replace Unsuitable Coils with Import Soils		_____CY
27.	10” PE Pipe Installed		_____LF
28.	Drop Inlet		_____EA
29.	Downspout Boot		_____EA
30.	10” Concrete Trench Drain with Grate		_____LF
31.	SOD		_____/SY
32.	Asphalt Paving		_____/Ton
33.	DGA		_____/Ton
34.	Stone Aggregate		_____/Ton
35.	Concrete Walk		_____SY
36.			
37.			
38.			
39.			
40.			

DIRECT MATERIAL PURCHASES:

Indicate on the lines below those materials to be purchased directly by the Owner with a Purchase Order to be issued by the Owner to the individual suppliers. The value of the direct Purchase Order cannot be less than $5,000. Following the approval of bids, the Contractor shall formalize this list by completing and submitting the electronic Purchase Order Summary Form provided by KDE. Listing the supplier below means the Contractor is acknowledging authorization from the Supplier to include the Supplier in this bid.

A maximum of 50 POs will be acceptable with each bid. Do not add supplemental sheets for additional POs to this document.

The bidder shall submit the list of Purchase Orders within four (4) days of the bid.

	SUPPLIER (to be filled out by the Contractor)	**PURCHASE ORDER DESCRIPTION** (to be filled out by the Contractor)	**PURCHASE ORDER AMT.** (to be filled out by the Contractor)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			

	SUPPLIER (to be filled out by the Contractor)	**PURCHASE ORDER DESCRIPTION** (to be filled out by the Contractor)	**PURCHASE ORDER AMT.** (to be filled out by the Contractor)
20.			
21.			
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44.			

	SUPPLIER (to be filled out by the Contractor)	**PURCHASE ORDER DESCRIPTION** (to be filled out by the Contractor)	**PURCHASE ORDER AMT.** (to be filled out by the Contractor)
45.			
46.			
47.			
48.			
49.			
50.			

TIME LIMIT FOR EXECUTION OF CONTRACT DOCUMENTS:

In the event that a bidder's proposal is accepted by the Owner and such bidder should fail to execute the contract within ten (10) consecutive days from the date of notification of the awarding of the contract, the Owner, at his option, may determine that the awardee has abandoned the contract. The bidder's proposal shall then become null and void, and the bid bond or certified check which accompanied it shall be forfeited to and become the property of the Owner as liquidated damages for failure to execute the contract.

The bidder hereby agrees that failure to submit herein above all required information and/or prices can cause disqualification of this proposal.

Submitted by:

NAME OF CONTRACTOR / BIDDER: _____

AUTHORIZED REPRESENTATIVE'S NAME:_____
Signature

AUTHORIZED REPRESENTATIVE'S NAME(printed): _____

AUTHORIZED REPRESENTATIVE'S TITLE: _____

NOTICE: Bid security must accompany this proposal if the Base Bid price is greater than ~~of $25,000.~~ $100,000. (change effective June 3, 2019.)

This form shall not be modified.

SECTION 004313 - BID SECURITY FORMS

PART 1 - Bid Security Forms

1.1 BID FORM SUPPLEMENT

A. A completed bid bond form is required to be attached to the Bid Form and has been included in this section for reference.

1.2 BID BOND FORM

A. AIA Document A310, "Bid Bond," is the recommended form for a bid bond. AIA Document A312- "Performance Bond" is the recommended form for the performance bond, and both forms have been included in this section for your reference. A bid bond acceptable to Owner and Performance Bond are required to be attached to the Bid Form as supplements.

B. Copies of AIA standard forms may be obtained from The American Institute of Architects; www.aia.org/contractdocs/purchase/index.htm;

C. email: docspurchases@aia.org; (800) 942-7732.

END OF SECTION 004313

AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

BOND AMOUNT: $

PROJECT:
(Name, location or address, and Project number, if any)
-

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

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.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

Signed and sealed this day of ,

	(Contractor as Principal) *(Seal)*
(Witness)	*(Title)*
	(Surety) *(Seal)*
(Witness)	*(Title)*

Kentucky Department of Education Version of AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:

Amount:

Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: ☐ None ☐ See Section 16

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)
AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

KENTUCKY DEPARTMENT OF EDUCATION
Every Child Proficient and Prepared for SUCCESS

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

§ 16.1 Surety Company shall be licensed to conduct business in the Commonwealth of Kentucky.

§ 16.2 Insurance Agency and Agents issuing bond shall be registered and licensed to conduct business in the Commonwealth of Kentucky with the appropriate Power of Attorney included.

§ 16.3 Bond shall comply with all statutory requirements of the Commonwealth of Kentucky including the Kentucky Unemployment Insurance Law.

§ 16.4 No suit, action or proceeding by reason or any default whatever shall be brought on this bond after two (2) years from the date on which final payment of the contract fall due and provided further that if any alterations or additions which may be made under the contract or in the work to be done under it, or the giving by the Owner of any extension of time for the performance of the contract or any other forbearance on the part of either the Owner or the Principal shall not, in any way, release the Principal and Surety, or either of them, their heirs, executors, administrators, successors, or assigns for their liability hereunder. Notice to the Surety of any such alterations, extensions, or forbearance being expressly waived.

This obligation shall remain in force and effect until the performance of all covenants, terms and conditions herein stipulated and after such performance, it shall become null and void.

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

Kentucky Department of Education Version of AIA® Document A312™ – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:

Amount:

Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount:

Modifications to this Bond: ☐ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

AIA Document A312–2010 combines two separate bonds, a Performance Bond and a Payment Bond, into one form. This is not a single combined Performance and Payment Bond.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any

Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum

.1 the name of the Claimant;
.2 the name of the person for whom the labor was done, or materials or equipment furnished;
.3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
.4 a brief description of the labor, materials or equipment furnished;
.5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
.6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
.7 the total amount of previous payments received by the Claimant; and
.8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

§ 18.1 Surety Company shall be licensed to conduct business in the Commonwealth of Kentucky.

§ 18.2 Insurance Agency and Agents issuing bond shall be registered and licensed to conduct business in the Commonwealth of Kentucky with the appropriate Power of Attorney included.

§ 18.3 Bond shall comply with all statutory requirements of the Commonwealth of Kentucky including the Kentucky Unemployment Insurance Law.

§ 18.4 No suit, action or proceeding by reason or any default whatever shall be brought on this bond after two (2) years from the date on which final payment of the contract fall due and provided further that if any alterations or additions which may be made under the contract or in the work to be done under it, or the giving by the Owner of any extension of time for the performance of the contract or any other forbearance on the part of either the Owner or the Principal shall not, in any way, release the Principal and Surety, or either of them, their heirs, executors, administrators, successors, or assigns for their liability hereunder. Notice to the Surety of any such alterations, extensions, or forbearance being expressly waived.

This obligation shall remain in force and effect until the performance of all covenants, terms and conditions herein stipulated and after such performance, it shall become null and void.

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address		Address	

SECTION 004373 - PROPOSED SCHEDULE OF VALUES FORM

PART 1 - Proposed Schedule of Values Form

1.1 BID FORM SUPPLEMENT

A. A completed Proposed Schedule of Values form is required to be submitted by the successful bidder after the execution of the construction contract, a minimum of 21 days prior to the contractor's first application for payment.

1.2 PROPOSED SCHEDULE OF VALUES FORM

A. Proposed Schedule of Values Form: Provide a breakdown of the bid amount, including alternates, in enough detail to facilitate continued evaluation of bid. Coordinate with the Project Manual table of contents. Provide multiple line items for principal material and subcontract amounts in excess of five percent of the Contract Sum.

B. Arrange schedule of values consistent with format of AIA Document G703AIA Documents G702 and G703 included in this section.

1. Copies of AIA standard forms may be obtained from the American Institute of Architects;http://www.aia.org/contractdocs/purchase/index.htm; docspurchases@aia.org; (800) 942-7732.

END OF SECTION 004373

AIA® Document G702™ – 1992

Application and Certificate for Payment

TO OWNER:	**PROJECT:**	**APPLICATION NO:**	**Distribution to:**
		PERIOD TO:	OWNER: ☐
		CONTRACT FOR: General Construction	ARCHITECT: ☐
FROM CONTRACTOR:	**VIA ARCHITECT:**	**CONTRACT DATE:**	CONTRACTOR: ☐
		PROJECT NOS: / /	FIELD: ☐
			OTHER: ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM		$ 0.00
2. NET CHANGE BY CHANGE ORDERS		$ 0.00
3. CONTRACT SUM TO DATE (Line 1 ± 2)		$ 0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)		$ 0.00
5. RETAINAGE:		
a. 0 % of Completed Work (Column D + E on G703)	$ 0.00	
b. 0 % of Stored Material (Column F on G703)	$ 0.00	
Total Retainage (Lines 5a + 5b or Total in Column I of G703)		$ 0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)		$ 0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)		$ 0.00
8. CURRENT PAYMENT DUE		$ 0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	$ 0.00	

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$ 0.00	$ 0.00
Total approved this Month	$ 0.00	$ 0.00
TOTALS	$ 0.00	$ 0.00
NET CHANGES by Change Order	$ 0.00	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $ 0.00

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

AIA® Document G703™ – 1992

Continuation Sheet

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT,
containing Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD					
	GRAND TOTAL	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	0.00 %	$ 0.00	$ 0.00

SECTION 004393 - BID SUBMITTAL CHECKLIST

PART 1 - Bid Submittal Checklist

1.1 BID INFORMATION

A. Bidder: _____

B. Prime Contact: _____

C. Project Name: Spencer County Early Learning Center Partial Renovation

D. Project Location: Taylorsville, Kentucky

E. Owner: Spencer County Board of Education

F. Architect: Sherman Carter Barnhart Architects, Tom Smith, AIA

G. Architect Project Number: 2322

1.2 BIDDER'S CHECKLIST

A. In an effort to assist the Bidder in properly completing all documentation required, the following checklist is provided for the Bidder's convenience. The Bidder is solely responsible for verifying compliance with bid submittal requirements.

B. Attach this completed checklist to the outside of the Submittal envelope.

1. Used the Bid Form provided in the Project Manual.
2. Prepared the Bid Form as required by the Instructions to Bidders.
3. Indicated on the Bid Form the Addenda received.
4. Attached to the Form of Proposal: Form of Proposal Attachment.
5. Attached to the Bid Form: Bid Bond OR a certified check for the amount required.
6. Bid envelope shows name and address of the Bidder.
7. Bid envelope shows name of Project being bid.
8. Bid envelope shows name of Prime Contract being bid, if applicable.
9. Bid envelope shows time and day of Bid Opening.
10. Verified that the Bidder can provide executed Performance Bond and Labor and Material Bond.
11. Verified that the Bidder can provide Certificates of Insurance in the amounts indicated.

END OF SECTION 004393

SECTION 006000 - FORMS

PART 1 - Forms

1.1 FORM OF AGREEMENT AND GENERAL CONDITIONS

A. The following form of Owner/Contractor Agreement and form of the General Conditions shall be used for Project:

1. AIA Document A101, "Standard Form of Agreement between Owner and Contractor, Stipulated Sum."

a. The General Conditions for Project are AIA Document A201, "General Conditions of the Contract for Construction."

2. The General Conditions are included in the Project Manual.
3. The Supplementary Conditions for Project are separately prepared and included in the Project Manual.
4. Owner's document(s) bound following this Document.

1.2 ADMINISTRATIVE FORMS

A. Administrative Forms: Additional administrative forms are specified in Division 01 General Requirements.

B. Copies of AIA standard forms may be obtained from the American Institute of Architects;http://www.aia.org/contractdocs/purchase/index.htm; docspurchases@aia.org; (800) 942-7732.

C. Preconstruction Forms:

1. Form of Performance Bond and Labor and Material Bond: AIA Document A312, "Performance Bond and Payment Bond."

D. Information and Modification Forms:

1. Form for Requests for Information (RFIs): AIA Document G716, "Request for Information (RFI)."
2. Form of Request for Proposal: AIA Document G709, "Work Changes Proposal Request."
3. Change Order Form: AIA Document G701, "Change Order."
4. Form of Architect's Memorandum for Minor Changes in the Work: AIA Document G707, "Architect's Supplemental Instructions."
5. Form of Change Directive: AIA Document G714, "Construction Change Directive."

E. Payment Forms:

1. Form of Agreement Between Owner and Contractor: AIA Document A101, "Standard Form of Agreement Between Owner and Contractor" (KDE Version)
2. KDE Purchase Order Summary Form
3. KDE Purchase Order & Instructions ((702 KAR 4:160)

4. Form of General Conditions for Construction: AIA Document A201, "General Conditions of the Contract for Construction" (KDE Version)
5. Form of Contractor's Affidavit: AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
6. Form of Affidavit of Release of Liens: AIA Document G706A, "Contractor's Affidavit of Payment of Release of Liens."
7. Form of Consent of Surety: AIA Document G707, "Consent of Surety to Final Payment."
8. Form of Requests for Clarification: AIA Document G716, "Contractor's Request for Information"
9. Form of Transmittal Letter: AIA Document G810, “Transmittal Letter”

END OF SECTION 006000

Kentucky Department of Education Version of AIA® Document A101™ – 2007

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

This version of AIA Document A101™–2007 is modified by the Kentucky Department of Education. Publication of this version of AIA Document A101–2007 does not imply the American Institute of Architects' endorsement of any modification by the Kentucky Department of Education. A comparative version of AIA Document A101–2007 showing additions and deletions by the Kentucky Department of Education is available for review on the Kentucky Department of Education Web site.

Cite this document as "AIA Document A101™–2007, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum — KDE Version," or "AIA Document A101™–2007 — KDE Version."

Kentucky Department of Education Version of AIA® Document A101 – 2007

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

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

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

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

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

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

The Owner and Contractor agree as follows.

KENTUCKY DEPARTMENT OF EDUCATION
Every Child Proficient and Prepared for SUCCESS

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

Init.
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TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.

(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

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

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

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than ( ) days from the date of commencement, or as follows:

(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work. Either list requirements for earlier Substantial Completion here or refer to an exhibit attached to this Agreement.)

Portion of Work	Substantial Completion Date

, subject to adjustments of this Contract Time as provided in the Contract Documents.

Liquidated Damages: As actual damages for delay in completion of Work are impossible to determine, the Contractor and his Surety shall be liable for and shall pay to the Owner the sum of

($), not as a penalty, but as fixed, agreed and liquidated damages for each calendar day of delay until the Contract Work is substantially completed as defined in the General Conditions of the Contract for Construction. The Owner shall have the right to deduct liquidated damages from money in hand otherwise due, or to become due, to the Contractor, or to sue and recover compensation for damages for failure to substantially complete the Work within the time stipulated herein. Said liquidated damages shall cease to accrue from the date of Substantial Completion.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be

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

(List the base bid amount, sum of accepted alternates, total construction cost (the sum of base bid amount plus sum of accepted alternates), sum of Owner's direct Purchase Orders. The Contract Sum shall equal the sum of Total Construction Cost, less Owner direct Purchase Orders. Either list this information here or refer to an exhibit attached to this Agreement.)

	Amount
Base Bid	$
Sum of Accepted Alternates	$
Total Construction Cost (the sum of base bid amount plus sum of accepted alternates)	$
Sum of Owner's direct Purchase Orders	$
Contract Sum (total construction cost less Owner direct Purchase Orders)	$

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

Number	Item Description	Amount
	Total of Alternates	

§ 4.3 Unit prices, if any:
(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable. Either list unit prices here or refer to an exhibit attached to this Agreement.)

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.4 Allowances included in the Contract Sum, if any:
(Identify allowance and state exclusions, if any, from the allowance price. Either list allowances here or refer to an exhibit attached to this Agreement.)

Item	Price

ARTICLE 5 PAYMENTS

§ 5.1 PROGRESS PAYMENTS

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

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

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

State law (KRS 371.405) requires the Owner to pay undisputed Applications for Payment within forty-five (45) business days following receipt of the invoices. If the Owner fails to pay the Contractor within forty-five (45) business days following receipt of an undisputed Application for Payment, state law requires the Owner shall pay interest to the Contractor beginning on the forty-sixth business day after receipt of the Application for Payment, computed at the rate required by state law.

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

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

§ 5.1.6 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

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

.2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of percent (%);

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

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

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

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

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

§ 5.1.8 Reduction or limitation of retainage, if any, shall be as follows:
When Owner direct Purchase Orders are used, retainage that would otherwise be held on materials and equipment shall transfer to the Contractor, and the material suppliers will be paid the full amount of their invoices. The Owner shall retain ten percent (10%) from each Application for Payment, and an amount equal to ten percent (10%) of approved Purchase Order payments, up to fifty percent (50%) completion of the Work, then provided the Work is on schedule and satisfactory, and upon written request of the Contractor together with consent of surety and the recommendation of the Architect, the Owner shall approve a reduction in Retainage to five percent (5%) of the current Contract Sum plus Purchase Orders. No part of the five percent (5%) retainage shall be paid until after Substantial Completion of the Work, as defined in the General Conditions of the Contract for Construction. After Substantial Completion, if reasons for reduction in retainage are certified in writing by the Architect, a reduction to a lump sum amount less than the five percent (5%) retainage may be approved by the Owner when deemed reasonable. The minimum lump sum retainage shall be twice the estimated cost to correct deficient or incomplete work.

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

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

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–2007 — KDE Version, and to satisfy other requirements, if any, which extend beyond final payment;
.2 a final Certificate for Payment has been issued by the Architect; and
.3 the Contractor provides the Owner with affidavits that all payrolls, bills for materials, supplies and equipment, and other indebtedness connected with the Work have been paid or otherwise satisfied, and with Consent of Surety for final payment.

ARTICLE 6 DISPUTE RESOLUTION
§ 6.1 INITIAL DECISION MAKER
The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201–2007 — KDE Version, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 BINDING DISPUTE RESOLUTION

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

☐ Arbitration pursuant to Section 15.4 of AIA Document A201–2007 — KDE Version

☐ Litigation in a court of competent jurisdiction where the Project is located

☐ Other: *(Specify)*

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007 — KDE Version.

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

ARTICLE 8 MISCELLANEOUS PROVISIONS

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

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

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

§ 8.4 The Contractor's representative:
(Name, address and other information)

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

§ 8.6 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

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

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

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

§ 9.1.3 The Supplementary and other Conditions of the Contract:
(Either list Supplementary and other Conditions of the Contract here or refer to an exhibit attached to this Agreement.)

Document	Title	Date	Pages

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

Section	Title	Date	Pages

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

Number	Title	Date

§ 9.1.6 The Addenda, if any:
(Either list the Addenda here or refer to an exhibit attached to this Agreement.)

Number	Date	Pages

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

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

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

.2 Other documents, if any, listed below:

(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2007 — KDE Version provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

A. AIA Document A701–1997, Instructions to Bidders — KDE Version

B. Contractor's Form of Proposal

C. KDE Purchase Order Summary Form

ARTICLE 10 INSURANCE AND BONDS

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

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2007 – KDE Version. Either list insurance and bond information here or refer to an exhibit attached to this Agreement.)

Type of Insurance or Bond	Limit of Liability or Bond Amount ($0.00)

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

OWNER *(Signature)*	CONTRACTOR *(Signature)*
(Printed name and title)	*(Printed name and title)*

Kentucky Department of Education

FACPAC PURCHASE ORDER FORM & Instructions

1. FACPAC Purchase Orders Form is now required by the Kentucky Department of Education for processing of purchase orders.

   The Purchase Order Summary Form may be completed and returned with the contract for a timely review by KDE.

   NOTE: The Purchase Order Summary is not a substitute for FACPAC Purchase Orders, and the Purchase Order Summary is only used as a "placeholder" to allow timely information for review and approval by KDE for the Bond Sale. <u>It is not valid unless signed.</u>

2. For **General Construction** projects: FACPAC Purchase Order will be created by the Architect in the system, printed and provided to the General Contractor for signatures. The General Contractor will return the Purchase Order to Architect for final processing thru FACPAC.

3. For **Construction Management** projects: FACPAC Purchase Order will be created by the Construction Manager for final processing thru FACPAC.

4. FACPAC Purchase Order Form (sample copy attached).

5. KDE Purchase Order Summary Sheet attached. Excel file may be obtained by from KDE website or from Architect. (copy attached)

FACPAC Purchase Order Form

Project:
BG Number:
Status:

District:
Phase: Project Initiation (View Checklist)

Contract:
Type: General Contractor

Proposed

District PO Number
Ky Sales Tax Exempt Number
Date of Order
Specification Section
Material Description / Category
Requested By
Vendor Name
Vendor Address

Vendor Phone
Vendor Email
Bill To
Bill To Address

Ship To
Ship To Address

Attention Of

Contacts

The following project contacts must be notified 48 hours in advance of delivery to jobsite.

Contact Name	Contact Phone

Materials

Furnish the necessary materials to complete the following bid package(s) / specification section(s) in its entirety. All materials shall be in accordance with the requirements of the Contract.

Item Description	Item Number	Quantity	Unit Price	Total
			Purchase Order Total:	$0.00

Authorization

Owner Authorization Date
Vendor Authorization Date

Purchase Order Signature Page

Vendor Date

Owner Date

Terms and Conditions

1. Drawings, catalogs, cut sheets, or samples shall be submitted for approval.
2. All invoices shall be sent to the contractor/subcontractor designated on the purchase order for approval. No invoices shall be sent directly to the Board of Education (Owner) for payment.
3. All invoices shall reference the purchase order number.
4. No change in, modification of, or revision of this order shall be valid unless in writing and signed by the Owner.
5. Vendor agrees to observe and comply with all applicable federal, state and locals laws, rules, ordinances and regulations in performance of this order.
6. Vendor shall not assign this order or any right hereunder without first having obtained the written consent of the Owner.
7. Deliveries are to be made in accordance with the Owner's schedule, as directed by the General Contractor (GC), Construction Manager (CM) or Qualified Provider (QP).
8. The Owner may cancel this purchase order in whole or in part in the event that the vendor fails or refuses to deliver any of the items purchased, within the time provided, or otherwise violates any of the conditions of this purchase order, or if it becomes evident that the vendor is not providing materials in accordance with the specifications or with such diligence as to permit delivery on or before the delivery date.
9. The vendor agrees to deliver the items to the supplied hereunder free and clear of all liens, encumbrances and claims.
10. If any of the goods covered under this purchase order are found to be defective in material or workmanship, or otherwise not in conformity with the requirements of this order, the Owner, in addition to the other rights which it may have under warranty or otherwise, shall have the right to reject the same or require that such articles or materials be corrected or replaced promptly with satisfactory materials or workmanship.
11. By acknowledging receipt of this order, by performing the designated work or any portion thereof, or by shipping the designated goods, the vendor agrees to the terms and conditions outlined.
12. This purchase order shall be governed in all respects by the laws of the Commonwealth of Kentucky.
13. In the event the quantities of materials supplied via this purchase order are insufficient to complete the work, the GC, CM or QP shall, at no expense to the Owner, provide such materials as necessary to complete the work.
14. In the event that at the completion of the work the vendor has not submitted invoices totaling the value of this purchase order, this purchase order shall be considered complete and closed.

Kentucky Department of Education
702 KAR 4:160

Purchase Order Summary Form

BG# ________ **Date Submitted** ________________

District Code ________ **District Name** ________________

School Code ________ **Facility Name** ________________

Delivery Method

☐ GC ☐ GESC
☐ CM

PO Certification Statement Phase

☐ Initial Statement ☐ Final Statement
☐ Change Order Stmt.

Contractor Name	PO Number	Bid. Pack. #	Specification Section No.	Purchase Order Description	Vendor Name	Initial PO Amount	Change Order Amount To Date	Reason For Change	Final PO Amount
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
									-
					Initial PO Total	$ -	$ -	**Final PO Total**	$ -

All signatures below are required based upon the appropriate PO certification statement phase. (Initial / Final)

Initial Certification Statement
To the best of my knowledge, I certify that all materials listed within this document will be purchased in accordance with 103 KAR 26:070 and 702 KAR 4:160.

Owner's Signature Date

General Contractor's / Construction Manager's Sigr Date

Architect's Signature Date

Final Certification Statement
To the best of my knowledge, I certify that all materials listed within this document have been purchased in accordance with 103 KAR 26:070 and 702 KAR 4:160.

Owner's Signature Date

General Contractor's / Construction Manager's Signature Date

Architect's Signature Date

Kentucky Department of Education Version of AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

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

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

This version of AIA Document A201–2007 is modified by the Kentucky Department of Education. Publication of this version of AIA Document A201 does not imply the American Institute of Architects' endorsement of any modification by the Kentucky Department of Education. A comparative version of AIA Document A201–2007 showing additions and deletions by the Kentucky Department of Education is available for review on the Kentucky Department of Education Web site.

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

TABLE OF ARTICLES

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INDEX
(Topics and numbers in bold are section headings.)

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), Owner direct Purchase Orders, 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 (Not Used)

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

§ 3.7 Permits, Fees, Notices and Compliance with Laws

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

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

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

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 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 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 that would otherwise exist as to a party or person described in this Section 3.18.

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

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, and, at the discretion of the Owner may be the Owner's representative during the one-year period for correction of Work described in Section 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

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

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

§ 4.2.4 Communications Facilitating Contract Administration

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

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

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

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance

with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, 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 or separate contractors as provided in Section 10.2.5.

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

§ 6.3 Owner's Right to Clean Up

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

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

§ 7.1.4 Proposed Change in the Work equal to or exceeding $25,000 additive or deductive, shall be subject to approval by the Kentucky Department of Education prior to execution of the Change Order by the Owner.

§ 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 not to exceed fifteen (15%) of the net cost of the change. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

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

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

.3 Rental costs of machinery and equipment, 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 as stipulated in Section 9.3.4.

§ 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.

§ 9.3.4 When Owner direct Purchase Orders are used, retainage that would otherwise be held on materials and equipment shall transfer to the Contractor, and the material suppliers will be paid the full amount of their invoices. The Owner shall retain ten percent (10%) from each Application for Payment, and an amount equal to ten percent (10%) of approved Purchase Order payments, up to fifty percent (50%) completion of the Work, then provided the Work is on schedule and satisfactory, and upon written request of the Contractor together with consent of surety and the recommendation of the Architect, the Owner shall approve a reduction in Retainage to five percent (5%) of the current Contract Sum plus Purchase Orders. No part of the five percent (5%) retainage shall be paid until after Substantial Completion of the Work, as defined in Section 9.8. herein. After Substantial Completion, if reasons for reduction in retainage are certified in writing by the Architect, a reduction to a lump sum amount less than the five percent (5%) retainage may be approved by the Owner when deemed reasonable. The minimum lump sum retainage shall be twice the estimated cost to correct deficient or incomplete 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 or as required by state law, whichever is more restrictive, 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. The ability to occupy and utilize the Work or designated portion thereof shall require an

occupancy permit issued by the Kentucky Department of Housing, Building, and Construction and any other agencies that have statutory authority and approval requirements.

§ 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.

.1 Upon receipt and approval of the final Application for Payment, for each Contract and Purchase Order, if any, the Architect will prepare, and the Architect and Owner shall complete their portion of the Kentucky Department of Education BG-4 Contract Closeout Form – 2013, and forward the board-approved BG-4 form to the Kentucky Department of Education with a copy of the final Certificate for Payment upon the Board authorizing the BG-4 form, accepting the Work, and approving final payment to the Contractor or Material Supplier.

§ 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, (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. Such insurance shall be no less than the following amounts:

(1)	Public Liability	$200,000.00 one person/maximum each person $500,000.00 one accident/maximum each person
(2)	Property Damage	$200,000.00 one accident/maximum $500,000.00 aggregate

§ 11.1.2.1 The insurance required by Section 11.1.1 shall be written for not less than the following limits, or greater if required by law:

(1) Worker's Compensation:

a.	State	Statutory
b.	Applicable Federal (e.g., Longshoreman's)	Statutory
c.	Employer's Liability	$500,000

(2) Comprehensive or Commercial General Liability (including Premises-Operations; Independent Contractor's Protection; Product Liability and Completed Operations; Broad Form Property Damage);

a.	General Aggregate (except Products-Completed Operations)	$1,000,000
b.	Products-Completed Operations Aggregate	$1,000,000
c.	Personal/Advertising Injury (per person/organization)	$1,000,000
d.	Each Occurrence (Bodily Injury and Property Damage)	$1,000,000
e.	Limit per Person Medical Expense	$10,000

f. Exclusions of Property in Contractors Care, Custody or Control will be eliminated.

g. Property Damage Liability Insurance will provide Coverage for Explosion, Collapse, and Underground Damage.

(3) Contractual Liability:

a.	General Aggregate	$1,000,000
b.	Each Occurrence (Bodily Injury and Property Damage)	$1,000,000

(4) Automobile Liability:

a.	Bodily Injury	$500,000 Each Person $1,000,000 Each Accident
b.	Property Damage	$500,000 Each Accident, or a combined single limit of $1,000,000

(5) Liability coverage for the Owner, the Architect, the Architect's Consultants and others listed in the Supplementary Conditions will be provided (subject to customary exclusions for professional liability), by endorsement as additional insured's on the Contractor's Liability Policy.

(6) Excess Liability Umbrella Form:

a.	General Aggregate	$1,000,000
b.	Each Occurrence	$1,000,000

§ 11.1.2.2 There shall be an endorsement in each of the above policies reading as follows: "It is hereby agreed that in the event of a claim arising under this policy, the company may not deny liability be reason of the insured being a state, county, municipal corporation or governmental agency."

§ 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 Owner 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 Before an exposure to loss may occur, the Owner shall provide the Architect and the Kentucky Department of Education with certificates of insurance coverage required by this Section 11.3.

§ 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 Unless otherwise provided, when the Contract Sum exceeds ~~twenty-five thousand dollars ($25,000)~~ one-hundred thousand dollars ($100,000) the Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. A surety company authorized to do business in Kentucky shall execute bonds, and the cost thereof shall be included in the Contract Sum. Unless otherwise provided, the amount of each bond shall be equal to 100% of the Contract Sum plus Purchase Orders, or 100% of the Lump Sum Base Bid plus or minus accepted Alternates, whichever is greater. **(Refer to attached KDE Directions on KDE Version of AIA Doc A201-2007).**

§ 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.

§ 13.1.1 None of the Contract Documents for this project shall be construed against the party preparing documents on the grounds that the party prepared or drafted the document, or any portion thereof.

§ 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 required by state law, or in the absence of law, at the legal rate prevailing at the time and 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 is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

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

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

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 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 shall be in accordance with the Construction Industry Mediation Procedures of the American Arbitration Association 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.

§ 15.4 Arbitration

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

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

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

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

§ 15.4.4 Consolidation or Joinder

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

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

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

KDE Directions on
Kentucky Department of Education Version of
AIA Document A201 – 2007 General Conditions of the Contract for Construction
June 3, 2017

Modify **Article 11 INSURANCE AND BONDS, Paragraph 11.4 Performance and Payment Bond, Subparagraph 11.4.1** as follows:

"11.4.1 Unless otherwise provided, when the Contract Sum exceeds one hundred thousand ($100,000) the Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. A surety company authorized to do business in Kentucky shall execute bonds, and the cost thereof shall be included in the Contract Sum. Unless otherwise provided, the amount of each bond shall be equal to 100% of the Contract Sum plus Purchase Orders, or 100% of the Lump Sum Base Bid plus or minus accepted Alternates, whichever is greater."

AIA® Document G706™ – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR:

CONTRACT DATED:

TO OWNER: *(Name and address)*

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
SURETY: ☐
OTHER: ☐

STATE OF:
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707, Consent of Surety, may be used for this purpose

Indicate Attachment ☐ Yes ☒ No

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

CONTRACTOR: *(Name and address)*

BY: _____
(Signature of authorized representative)

_____
(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

AIA® Document G706A™ – 1994

Contractor's Affidavit of Release of Liens

PROJECT: *(Name and address)*	**ARCHITECT'S PROJECT NUMBER:**	OWNER: ☐
	CONTRACT FOR:	ARCHITECT: ☐
		CONTRACTOR: ☐
TO OWNER: *(Name and address)*	**CONTRACT DATED:**	SURETY: ☐
		OTHER: ☐

STATE OF:
COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY: _____
(Signature of authorized representative)

_____
(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

AIA® Document G707™ – 1994

Consent Of Surety to Final Payment

PROJECT: *(Name and address)*
-

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR: General Construction

CONTRACT DATED:

TO OWNER: *(Name and address)*

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
SURETY: ☐
OTHER: ☐

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

, SURETY,

on bond of
(Insert name and address of Contractor)

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to
(Insert name and address of Owner)

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

_____
(Surety)

_____
(Signature of authorized representative)

Attest:
(Seal):

_____
(Printed name and title)

AIA® Document G716™ – 2004

Request for Information ("RFI")

TO: **FROM:**

PROJECT: **ISSUE DATE:** **RFI No.**

REQUESTED REPLY DATE:

PROJECT NUMBERS: / **COPIES TO:**

RFI DESCRIPTION: *(Fully describe the question or type of information requested.)*

REFERENCES/ATTACHMENTS: *(List specific documents researched when seeking the information requested.)*
SPECIFICATIONS: **DRAWINGS:** **OTHER:**

SENDER'S RECOMMENDATION: *(If RFI concerns a site or construction condition, the sender may provide a recommended solution, including cost and/or schedule considerations.)*

RECEIVER'S REPLY: *(Provide answer to RFI, including cost and/or schedule considerations.)*

BY **DATE** **COPIES TO**

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

AIA® Document G810™ – 2001

Transmittal Letter

PROJECT: *(Name and address)*
-

TO: *(Name and address)*

FROM: *(Name and address)*

WE TRANSMIT:
VIA:
- ☐ Attached
- ☐ Overnight delivery
- ☐ Courier
- ☐ Under separate cover
- ☐ Mail
- ☐ Fax
- ☐ E-mail
- ☐ Other

FOR:
- ☐ Approval / Action
- ☐ Comment
- ☐ Information
- ☐ Distribution
- ☐ Use as requested
- ☐ Other

THE FOLLOWING:
- ☐ Drawings
- ☐ Submittals
- ☐ Specifications
- ☐ Other
- ☐ Digital Files

NO. OF COPIES	DATE	FORMAT	DESCRIPTION

REMARKS:

BY:

COPIES TO:

SECTION 006100 - SUPPLEMENTARY CONDITIONS

PART 1 - Supplementary Conditions

1.1 SUPPLEMENTARY CONDITIONS

A. Supplementary Conditions for Project consist of the following:

1. AIA Document A201, "General Conditions of the Contract for Construction," (KDE Version) a copy of which is bound in this Project Manual.
2. The following Supplementary Conditions that modify and add to the requirements of the General Conditions of the Contract.

1.2 SUPPLEMENTARY CONDITIONS, GENERAL

A. The following Supplementary Conditions modify or add to the AIA Document A201-2007 General Conditions of the Contract for Construction (KDE Version). Where any Article of the Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

1.3 ARTICLE 3 - CONTRACTOR

A. Add Sections 3.2.5 and 3.5.6.

1. 3.2.5 - Plans and specifications for this project show or specify various structural, architectural, mechanical and electrical entities, diagrams and devices for each item. The mention of acceptable manufacturer does not necessarily imply that their particular "standard" product meets all of the requirements of the detail or specifications. Therefore, the cost of deviations, extensions or adjustments required for the low Bidder's product must be included in the General Contractor's bid. No additional cost will be considered.

2. 3.2.6 - The Contract Documents are complementary and what is called for in one shall be as binding as if called for by all.

   By execution of this Contract, the Contractor warrants that he has visited the site of the proposed work, and fully acquainted himself with the conditions there existing relating to construction and labor and that he fully understands the facilities, difficulties, and restrictions attending the execution of the work under contract. The Contractor further warrants that he has thoroughly examined and is familiar with the drawings, specifications and all other documents comprising the contract. The Contractor further warrants that by execution of this contract, his failure, when he was bidding on this contract, to receive or examine any form, instrument, or document or to visit the site and acquaint himself with conditions there existing, in no way relieves the Contractor agrees that the Owner shall be justified in rejecting any claim based on facts regarding conditions for which he should have been on prior notice.

Before ordering material or performing any work, the Contractor shall verify all measurements at the work site. Any difference between dimensions on the Drawings and actual measurements shall be brought to the Architect's attention for his consideration before the work may proceed. No extra compensation will be allowed because of difference between actual measurements and dimensions indicated on the Drawings. The Contractor shall assume full responsibility for accuracy of measurements obtained at the Work Site.

Dimensions which are lacking shall be obtained from the Architect. In no case shall drawings be scaled.

1.4 ARTICLE 3 – LABOR AND MATERIALS

A. Add Section 3.4.4:

1. 3.4.4 - Where the salvage of materials is indicated on the drawings and specifications, all such materials shall be carefully removed and stored as directed by the Owner/Architect.

B. Add Section 3.5.1:

1. 3.5.1 - The contractor shall also provide warranties as required by the technical specifications.

C. Add Section 3.6.1:

1. 3.6.1 - Contractor is to exclude sales tax for this project on materials as listed on the Form of Proposal Material Breakout List. The Owner shall provide Owner’s tax exemption certificate and Owner’s purchase orders for direct payment to material vendor for the items listed on the material Breakout List. Contractor may choose to include sales tax on materials considered minor in nature and or material to be directly purchased by the Contractor in lieu of purchase orders paid by the Owner.

D. Add the Sections 3.7.6 and 3.7.7:

1. 3.7.6 - All branches of the work shown on the plans or specified shall be executed in strict compliance with all local or state regulations and codes, and shall be in compliance with all National Codes, when same have jurisdiction.

2. 3.7.7 - All Contractors must be qualified, and meet all requirements provided and/or required under any local and/or state statute, code, ordinances, or rule, governing the performance of the type of work of which he submits a bid, and be able to submit proof thereof upon request3.4 - Addenda:

1.5 ARTICLE 5 - SUBCONTRACTORS

A. Add Section 5.3.1:

1. 5.3.1 - All subcontractors shall familiarize themselves with all of the conditions relating to this contract since the terms set forth in the General Conditions binds all subcontractors to the Contract.

1.6 ARTICLE 7 – CHANGES IN WORK

A. Add Section 7.2.2:

1. 7.2.2 - The Contractor's proposals for work to be covered by a change order shall contain a detailed breakdown of all costs. Separate amounts shall be shown for each material item labor and profit.

1.7 ARTICLE 8 - TIME

A. Add Sections 8.2.4, 8.2.5 and 8.2.6:

1. 8.2.4 - The date of substantial completion shall be as noted below:

a. March 1, 2026

2. 8.2.5 - Should the Contractor fail to complete the work under this Contract on or before the date stipulated for Substantial Completion or such later date as may result from extensions in the Contract time granted by the Owner, he agrees that the Owner is entitled to and shall pay the Owner as liquidated damages, the sum of **$500.00** for each consecutive calendar day until such time as Substantial Completion is provided and accepted by the Owner.

3. 8.2.6- The date of Final Completion shall be as noted below:

a. **30 days after date of Each Substantial Completion**

4. 8.2.7 - Should the Contractor fail to "Final Complete" the project on or before the date stipulated for Final Completion, he agrees that the Owner is entitled to, and shall pay the Owner, as liquidated damages, the sum of $**500.00** for each consecutive calendar day until such time as Final Completion is provided and accepted by the Owner.

1.8 ARTICLE 9 – PAYMENTS AND COMPLETION

A. Add Section 9.3.1.3

1. 9.3.1.3 - The date for each progress payment shall be established to provide sufficient time for the architect's review and for the owner to include the application payment in the agenda of the next regularly scheduled board meeting.

B. Add Section 9.3.5 and 9.3.6

1. 9.3.5 - The Owner and the contractor each binds himself, his partners, successors, assigns and legal representative of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract or sublet it as a whole without written consent of the other, nor shall the Contractor assign any monies due or to become due to him hereunder, without the previous written consent of the Owner.

2. 9.3.6 - Retainage amount as stipulated in KDE Amendment AIA 201 – 2007 Subparagraph 9.3.4 shall be applied to Contractor’s Application for Payment and shall include retainage for material invoices for direct purchased materials. Retainage shall be retained from Contractor’s Pay Application and not retained on invoiced materials. Retainage for invoiced materials shall be held from Contractor’s Pay Application.

C. Add to the front of Section 9.10.1 the following:

1. 9.10.1 - Final completion of the work shall mean when all "punch list" items are completed, when "waiver of lien" is submitted, the manufacturers' warranties are submitted and the contractor has delivered to the Architect all required certificates of inspection. Final Completion shall include final clean-up of the building and premises.

1.9 ARTICLE 10 – PROTECTION OF PERSONS AND PROPERTY

A. Add Sections 10.2.9, 10.2.9.1, 10.2.9.2, 10.2.9.3, 10.2.9.4, and 10.2.9.5

1. 10.2.9 - "CONSTRUCTION AND SAFETY DEVICES: The Contractor shall provide safety controls for protection of the life and health of employees. He will utilize precautionary methods for the prevention of damage to property, materials, equipment and supplies, and for avoidance of work interruptions in the performance of this contract. In order to provide such safety controls aforesaid, the Contractor shall comply with all pertinent provisions of the Kentucky Safety Standards of the Division of the Occupational Safety Standards of the Division of Occupational Safety, Department of Labor and Federal Occupational Safety and Health Construction Standards (OSHA), that are in effect at the time of this contract is entered into and during the period in which the contract is to be performed. Contractor shall also take or cause to be taken such additional measures as the Division of Occupational Safety may determine to be reasonable necessary for the purpose.

   a. 10.2.9.1 - The Contractor shall maintain an accurate account of and shall report to the Division of Occupational Safety in the manner and on the forms prescribed by the Division, exposure date and all accidents resulting in death, traumatic injury, occupational disease, and/or damage to property, materials, supplies and equipment incident to work performed under this Contract.

      The Division of Occupational Safety will notify the Contractor through the Owner of any non-compliance with the foregoing provisions and the action to be taken. The Contractor shall, after receipt of such notice, immediately correct conditions. Such notice when delivered to the Contractor or his representative at the site of work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until unsatisfactory or corrective action has been taken. Failure or refusal to comply with the order will be grounds for stopping all payments due under the contract of the Contractor. No part of the time lost due to any such stop order shall be made the subject of claim or extension of the time or for excess cost or damages to the Contractor.

      Compliance with the provisions of the foregoing sections by subcontractors will be the responsibility of the prime contractor.

      Nothing in the aforesaid provisions shall prohibit the U.S. Department of occupational Safety and Health, from enforcing pertinent occupational safety and health standards as authorized under Federal or State Occupational Safety and Health Law.

      In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 7 "Changes in Work".

1.10 ARTICLE – 11 INSURANCE AND BONDS

A. Add Sections 11.4.3, 11.4.4 and 11.4.5

1. 11.4.3 - Contractor shall also furnish such other bonds as are required by the Supplementary Conditions. All Bonds shall be in the forms prescribed by the bidding documents or Supplementary Conditions and be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act. The Surety shall be acceptable to the Owner. All Bonds shall remain in effect at least until one year after the date of final payment, except as otherwise provided by law.

2. 11.4.4 - If the surety on any Bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in the state of the point of delivery or the surety ceases to meet the requirements stated in the above paragraph, Contractor shall within five days thereafter substitute another Bond and surety, both of which must be acceptable to Owner at no additional cost to Owner.

3. 11.4.5 - Performance & Payment Bond amounts are to include both contract sum and purchase order amounts as included in bid sum.

1.11 ARTICLE 13 – MISCELLANEOUS PROVISIONS

A. Add Section 13.5.7

1. 13.5.7 - Testing of materials and systems shall be as specified in their particular sections of the technical specifications.

B. Add Section 13.9 – Non-Discrimination

1. 13.9 - The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, creed, color or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, emotion or transfer; recruitment of recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this non-discrimination clause.

    a. 13.9.1 - The Contractor will, in all solicitations or advertisement for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

    b. 13.9.2 - The Contractor will send each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor commitments under this section, and shall post

copies of the notice in conspicuous places available to employees and applicants for employment. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency sanctions for non-compliance.

C. Add Section 13.10 – Affidavit of Assurances

1. 13.10 - Prior to execution of the Contract, the Owner will require of the Contractor a completed and notarized AFFIDAVIT OF ASSURANCES PURSUANT TO KRS 198B.060(10). A copy of the affidavit for DOH-BCE-04, dated 7/90, is attached at the end of the Supplemental Conditions.

D. Add to the end of Section 15.1.5.2 the following:

1. The reference to "adverse weather" shall be clarified to mean weather conditions which are in excess of the 20 year norm as recorded by the National Oceanographic Association."

END OF SECTION 006100

SECTION 006200 - SPECIAL CONDITIONS

INDEX TO SPECIAL CONDITIONS:

1. DEFINITIONS:

1a. The term "OWNER" as used throughout these documents means the: Spencer County Board of Education

1b. The term "ARCHITECT" as used throughout these documents means Sherman Carter Barnhart Architects, PLLC, 144 Turner Commons Way, Suite 110, Lexington, Kentucky 40508, (859) 224-1351, c/o Tom Smith, AIA, tsmith@scbarchitects.com

1d. The terms "PLANS" and "DRAWINGS" are used interchangeably and are construed to have the same meaning.

2. GENERAL:

2a. These specifications and drawings accompanying them describe the work to be done and the materials to be furnished for the Spencer County Early Learning Center Partial Renovation.

2b. Should any error or inconsistency appear in the Drawings or Specifications, the Contractor, before proceeding with the work, must make mention of the same to the Architect for proper adjustment and in no case proceed with the work in uncertainty or with insufficient drawings.

2c. The work under this contract does not include any items marked N.I.C. on the drawings (not in contract).

2d. Contractors shall follow sizes in specifications or figures on drawings, in preference to scale measurements and follow detail drawings in preference to general drawings.

2e. Where it is obvious that a drawing illustrates only a part of a given work or of a number of items, the remainder shall be deemed repetitious and so constructed.

3. ARCHITECT'S WORK PRODUCT:

3a. The Architect's work product is prepared and produced for the sole and exclusive benefit of the Owner. Any real or inferred benefits to third parties is hereby expressly disclaimed.

4. ADMINISTRATION OF THE CONTRACT:

4a. The Architect will perform certain administrative functions of the construction contract. Nothing contained in these contract documents, not any other oral or written agreements, memoranda, or communications shall create any express or implied contractual relationship between the Architect and the Contractor.

4b. The Architect may make periodic visits to the work site in accordance with the conditions of his contract with the Owner. The purpose of these visits and observations is to endeavor to guard against defects and deficiencies, not to supervise the Contractor's work.

4c. The Architect makes no express or implied representations of guaranteeing the Contractor's work.

4d. The Architect is not a specialist in construction methods, techniques, sequences or procedures and therefore assumes no responsibility for the construction operations and safety program.

5. CONFLICTS:

5a. If there is any conflict in the General Conditions with the Special Conditions, the Special Conditions shall govern.

6. WORKMANSHIP:

6a. The Workmanship shall be of the highest quality, in every respect, as usually recognized in the building industry. Poor or inferior workmanship (as determined by the Architect, Engineers, or inspecting authorities) is to be removed and replaced to conform to the highest quality standards of the trades concerned, or otherwise corrected.

7. DRAWINGS AND SPECIFICATIONS:

7a. The drawing dimensions shall have precedence over scaled measurements and details over general drawings. In case of conflicts between Drawings and Specifications, the more stringent shall apply.

7b. Figured dimensions on the drawings are reasonably accurate and should govern in setting out the work. However, should the Contractor discover discrepancies or inaccuracies, it shall be the Contractor's responsibility to bring them to the attention of the Architect before making any changes. Changes shall be made only with the approval of the Architect.

8. DIVISION OF SPECIFICATIONS:

8a. Division of Specifications into sections is done for convenience of reference and is not intended to control contractors in dividing work among subcontractors or to limit scope of work performed by any trade under any given section.

9. ALLOCATION OF WORK:

9a. Where certain materials are specified to be installed under various headings, it shall be the responsibility of the General Contractor to re-allocate such work under the proper subcontractor if the specification is in conflict with local jurisdiction.

10. NOTICE AND SERVICE THEREOF:

10a. Any notice to any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by registered mail, to the said Contractor at his last address, or delivered in person to said Contractor or his authorized representative on the work.

11. CODES AND ORDINANCES:

11a. All branches of the work shown on the plans or specified, whether specifically mentioned or not, shall be executed in strict compliance with all local or state regulations and codes, and shall be in compliance with all National Codes, when same have jurisdiction.

12. SUBSTANTIAL COMPLETION, FINAL COMPLETION & SUBSEQUENT REVIEWS:

12a. In as much as all parties with and intend to prosecute the work in a diligent and good faith manner, and to complete the work in a timely fashion, the Contractor shall notify the Architect when the Contractor believes he has attained Substantial Completion. Notification shall be made at least five (5) calendar days prior to the date set to the Substantial Completion review. The Contractor shall comply with the prerequisite requirements for Substantial Completion as set forth in Section 01700 - Contract Closeout.

12b. Review Procedures. Upon receipt of the Contractor's request, the Architect will either proceed with review or advise Contractor of prerequisites not fulfilled. Following initial review, the Architect will either prepare a certificate of substantial completion, or advise the Contractor of work which must be performed prior to issuance of the certificate of substantial completion.

The Architect will repeat the review when requested and assured by the Contractor, in writing, that the Work has been substantially completed. Results of the completed review will form the initial "punch list" for final acceptance.

12c. The Architect will review the work upon the receipt of the Contractor's notice that he believes in good faith that, except for those items whose completion has been delayed due to circumstances that are acceptable to the Architect, the work has been completed, including punch list items from earlier reviews. Upon completion of review, the Architect will either recommend final acceptance and final payment, or will advise the Contractor of work not completed or obligations not fulfilled as required for final acceptance by issuance of another punch list.

12d. The Contractor, upon completion of all outstanding items set forth on the punch list, shall notify the Architect of the completion of the work. The Architect shall verify completion of the work by an on-site review.

12e. In the event that the work should still require further reviews after initial post final review, unless through no fault of the Contractor, the Contractor shall authorize the Owner to deduct from the remaining available construction funds those monies which represent the Architect's normal hourly compensation rates and normal expenses for any additional time and expense expended on this project by the Architect. Hourly rates and expense reimbursement rates will be governed by those rates stipulated in the agreement between the Owner and the Architect. The disbursement of available construction funds by the Owner to the Architect in the aforegoing situation, described herein, shall represent only actual charges associated with the expenditure of the Architect's time and expense and in no way represent a penalty assessed to the Contractor.

13. STORAGE OF MATERIALS:

13a. Each Contractor providing materials and equipment shall be responsible for the proper and adequate storage of his materials and equipment, and for the removal of same upon completion of his work. Storage of materials at the site shall be confined to areas within the Contract Limits, and the Contractor's designated parking area if necessary, where designated by the Architect.

14. LAYOUT:

14a. The General Contractor shall lay out the work and be responsible for all lines, levels and measurements of all work executed under this Contract; he shall verify the figures before laying out the work and will be held responsible for any error resulting from his failure to do so.

14b. The General Contractor shall be prepared to guarantee each of his subcontractors the dimensions which they may require for the layout and fitting of their work to the surrounding work.

15. DAMAGED FACILITIES:

15a. The General Contractor shall repair and/or replace, at no expense to the Owner, any sections of existing roads, drives, streets, sidewalks, curbs, utilities, buildings and other structures damaged by reason of work performed under this Contract or incidental thereto, whether by his own forces or by his subcontractors or by his material suppliers.

16. UNIT PRICES:

16a. The Unit Price for each of the items set forth in the Form of Proposal shall become a part of the Contract.

16b. All Unit Prices are subject to review by the Owner and Architect prior to being accepted for contract purposes.

16c. All subcontractors shall be bound by the Unit Prices of the General Contractor.

16d. It is mutually understood and agreed that such Unit Prices include all items of cost, overhead and profit for the Contractor and any subcontractor(s) involved, and that they shall be used uniformly without modification for either additions or deductions.

16e. The Rules of Measurement, as specified in Paragraph 17 of this Section, shall apply in the use of Unit Prices.

16e1. Each Unit Price involving earthwork shall cover, among other things, engineering (surveying) costs and all costs of keeping excavations dry.

17. RULES OF MEASUREMENT:

17a. The following Rules of Measurement shall apply in the use of Unit Prices:

17a1. Except as provision is made hereinafter for arbitrary measurements, the quantity of excavation shall be its in-place volume before removal.

17a2. No allowance will be made for excavating additional material of any nature taken out for the convenience of the Contractor, beyond the quantity computed under these Rules of Measurement.

17a3. The quantities of excavation shall be computed from instrument readings in vertical cross sections located at such intervals as will assure accuracy.

17a4. General excavation for buildings and sections of buildings, bases for equipment, sump pits, etc., involving an area of 200 or more square feet, shall be classified as "Mass Excavation".

17a5. Excavation for pipes, wall footings, grade beams, column footings, and sections of buildings such as bases for equipment, sump pits, etc., involving an area of 200 square feet, shall be classified as "Mass Excavation".

17a6. "Mass Excavation" shall arbitrarily be assumed to extend to vertical planes two (2) feet outside wall lines, and to the elevation of plan subgrade.

17a7. "Trench Excavation" for walls, grade beams, and sections of building, such as bases for equipment, sump pits, etc., involving an area less than 200 square feet shall be arbitrarily assumed to extend 2 feet wider than wall and grade beam thicknesses and outside walls of sections of buildings such as bases for equipment, sump pit, etc., but in no case less than three (3) feet wide sides vertical.

17a8. "Trench Excavation" for pipes shall arbitrarily be assumed to be two (2) feet wider than the outside diameter of the pipe barrel and with sides vertical.

17a9. "Trench Excavation" for wall footings and column footings shall be computed as vertical shafts, each with a horizontal cross section identical in shape and size with the plan of the footing.

17a10. The quantities of form work will be the area of forms in contact with concrete.

17a11. Concrete quantities shall be computed from plan size or if there are no drawings, from actual measurement of the work ordered and placed, waste excluded.

18. INTERRUPTION OF UTILITIES:

18a. Utility services to existing facilities shall not be interrupted unless absolutely necessary. Interruptions shall be of minimum duration and shall be scheduled to cause the least possible inconvenience. In all cases, the Owner shall be notified well in advance of an anticipated interruption of utilities.

19. CONTRACTOR COORDINATION:

19a. The General Contractor and all subcontractors and other on-site contractors shall cooperate and coordinate their work to expedite the progress of the project. All subcontractors shall review and refer to the drawings and specifications of other trades involved with their particular work
before proceeding. Any work installed which conflicts with another trade and had not been brought to the attention of the Architect prior to installation shall be removed at no additional expense to the Owner.

END OF SECTION 006200

SECTION 010200 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances.

1. Certain materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Square Foot allowances.

C. Related Sections include the following:

1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders.

1.3 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.

1.4 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

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

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. Allowances include all necessary materials, plus cost for delivery, installation, insurance, applicable taxes**,** overhead, and profit.

3.3 SCHEDULE OF ALLOWANCES

Allowance No. 1: Unsuitable soils allowance below plan bottom depth include an allowance based on the following scope: The contractor shall include in the base bid, an allowance to remove and dispose off-site and additional 100 CY of unsuitable soil, which may be encountered below plan bottom depth. The allowance price shall include replacement with 100 CY of DGA placed and compacted in accordance with the project geotechnical report and on-site testing agency recommendations. The allowance price shall also include installation of 1500 SF of 6 oz. non-woven filter fabric. Actual volumes in the allowance shall be measured by the on-site testing agency and the contract will be adjusted using unit prices. The allowance shall be included in the base bid with a line item shown on the bid form.

END OF SECTION 010200

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Owner-furnished products.
4. Access to site.
5. Work restrictions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

Project Identification: **Spencer County Board of Education Office Additions and Renovation**

Project Location: 110 Reasor Avenue, Taylorsville, KY 40071

A. Owner: Spencer County Board of Education

B. Architect: Sherman Carter Barnhart Architects, Project Manager, Tom Smith, tsmith@scbarchitects.com.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

B. Project consists of the renovation of the second floor of the facility including partial demolition, new masonry walls, doors, floor finishes, painting, casework, equipment, ceilings, lighting and controls, and plumbing including fixtures. Replacement of existing storm lines and downspout boots. HVAC replacement and fire protection work are under a separate contract.

C. Type of Contract:

1. Project will be constructed under multiple prime contracts.
   a. General Contract (All Trades)

D. Work by Others:
   1. Owner will contract with others for performance of some work identified in the contract document. The general contractor is to add the owner in scheduling and coordination of work of components / systems and finishes performed by Owner acquired others.

1.5 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

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

   1. Driveways, Walkways and Entrances: Keep driveways loading areas, 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.

      a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
      b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.6 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

   1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

   1. Notify Owner not less than two days in advance of proposed utility interruptions.
   2. Obtain Owner's written permission before proceeding with utility interruptions.

C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

   1. Notify Owner not less than two days in advance of proposed disruptive operations.
   2. Obtain Owner's written permission before proceeding with disruptive operations.

D. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes.

E. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

F. Identification: All representatives of the General Contractor and / or subcontractor shall wear a photo identification at all times.

END OF SECTION 011000

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Requirements:

1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Section 014000 "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

B. The listing of unit prices shall **NOT** be construed to mean that the listed work may be omitted from the Contractor’s bid. The unit prices are requested in the event of a change in project scope subsequent to execution of the construction contract.

1.4 PROCEDURES

A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

END OF SECTION 012200

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 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.

B.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. 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.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

B.

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.

C. 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 revisions to alternates.

D. Execute accepted alternates under the same conditions as other work of the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

PART 4 - Alternates Cost Estimate (NOT INCLUDED ON THE BG-3)

4.1 PART 5 – ALTERNATES

Alt. No. 1 Owner preferred manufacturer for lighting controls. Refer to drawings and specs.

Alt. No. 2 Work in Right-of-way

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions made during construction.

B. Related Requirements:

1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

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

1.4 ACTION SUBMITTALS

Substitution Request Form: Use form provided at the end of Section 002600.

1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions 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 substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.

h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from Kentucky Department of Housing, Building and Construction.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions 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 date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. 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.

2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven 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 seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitution of products will be reviewed. Requests for substitutions must be submitted to the Architect.

1. 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:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not adversely affect Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

1. 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:

a. 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.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.
f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.
j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:

1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 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 AIA Document G710, "Architect's Supplemental Instructions."

1.4 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. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
2. Within 20 days, when not otherwise specified, 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.
e. Quotation Form: Use forms acceptable to Architect.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim 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 Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Architect.

1.5 ADMINISTRATIVE CHANGE ORDERS

A. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

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 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:
   1. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
   2. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
   3. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

   1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

      a. Application for Payment forms with continuation sheets.
      b. Submittal schedule.
      c. Items required to be indicated as separate activities in Contractor's construction schedule.

   2. Submit the schedule of values to Architect at earliest possible date, but no later than seven21 days before the date scheduled for submittal of initial Applications for Payment.
   3. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.

B. Format and Content: Use 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. Contractor's name and address.
    d. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.
3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:

    a. Related Specification Section or Division.
    b. Description of the Work.
    c. Name of subcontractor.
    d. Name of manufacturer or fabricator.
    e. Name of supplier.
    f. Change Orders (numbers) that affect value.
    g. Total completed and stored to date of application
    h. Previous Applications
    i. Percentage of Completion
    j. Balance to Finish
    k. Retainage

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. 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.

    a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
10. 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.

11. 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.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial 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. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. 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 for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:

a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

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 conditional final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit executed waivers of lien on forms, acceptable to Owner.

H. 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. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
5. Schedule of unit prices.
6. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
7. Certificates of insurance and insurance policies.
8. Performance and payment bonds.
9. Data needed to acquire Owner's insurance.

I. Application for Payment at Substantial Completion: After Architect issues 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 Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: After completing Project closeout requirements, 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."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. General coordination procedures.
2. Requests for Information (RFIs).
3. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

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

1.4 INFORMATIONAL SUBMITTALS

A. 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. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide

names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

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 to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

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 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.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: AIA Document G716.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.

F. 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 disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 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: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule and conduct 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.

1. Conduct the conference to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Critical work sequencing and long-lead items.
    c. Designation of key personnel and their duties.
    d. Lines of communications.
    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. Submittal procedures.
    j. Preparation of record documents.
    k. Use of the premises.
    l. Owner's occupancy requirements.

m. Security.
n. Progress cleaning.

4. Minutes: Entity responsible for conducting meeting 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, and Owner's Commissioning Authority of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Submittals.
b. Possible conflicts.
c. Compatibility requirements.
d. Time schedules.
e. Manufacturer's written instructions.
f. Acceptability of substrates.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. 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 monthly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority 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 meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. 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) Status of submittals.

2) Access.
3) Temporary facilities and controls.
4) Progress cleaning.
5) Quality and work standards.
6) Field observations.
7) Status of RFIs.
8) Status of proposal requests.
9) Pending changes.
10) Status of Change Orders.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Startup construction schedule.
2. Contractor's construction schedule.
3. Construction schedule updating reports.
4. Site condition reports.
5. Special reports.

B. Related Requirements:

1. Section 011200 "Multiple Contract Summary" for preparing a combined Contractor's construction schedule.
2. Section 013300 "Submittal Procedures" for submitting schedules and reports.
3. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

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

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

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

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

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

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

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

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

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

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file, where indicated.
2. PDF electronic file.
3. Two paper copies.

B. Startup construction schedule.

1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.
4. Earnings Report: Compilation of Contractor's total earnings from commencement of the Work until most recent Application for Payment.

F. Construction Schedule Updating Reports: Submit with Applications for Payment.

G. Site Condition Reports: Submit at time of discovery of differing conditions.

H. Special Reports: Submit at time of unusual event.

I. Qualification Data: For scheduling consultant.

1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.

1.6 COORDINATION

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

B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

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

PART 2 - PRODUCTS

2.1 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 main element of the Work. Comply with the following:

1. 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.
2. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
3. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
4. 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.

5. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

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

1. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Use of premises restrictions.
    d. Environmental control.

4. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

    a. Temporary enclosure and space conditioning.
    b. Permanent space enclosure.
    c. Completion of mechanical installation.
    d. Completion of electrical installation.
    e. Substantial Completion.

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, and the following interim milestones:

1. Temporary enclosure and space conditioning.

E. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.

1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.

F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.
5. Pending modifications affecting the Work and Contract Time.

G. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

2.2 STARTUP CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven days of date established for commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. CPM Schedule: Prepare Contractor's construction schedule using a time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60 days after date established for the Notice to Proceed.

    a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.

2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.

C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

    a. Preparation and processing of submittals.
    b. Mobilization and demobilization.
    c. Utility interruptions.
    d. Installation.
    e. Work by Owner that may affect or be affected by Contractor's activities.
    f. Punch list and final completion.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

5. Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Architect's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.

   a. Each activity cost shall reflect an appropriate value subject to approval by Architect.
   b. Total cost assigned to activities shall equal the total Contract Sum.

D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.

E. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Main events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the schedule of values).

F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.

1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.

a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
b. Submit value summary printouts one week before each regularly scheduled progress meeting.

2.4 REPORTS

A. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.

1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.

B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

C. 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 013200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Related Requirements:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

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

C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.

2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal category: Action; informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect's final release or approval.
    g. Scheduled date of fabrication.
    h. Scheduled dates for purchasing.
    i. Scheduled dates for installation.
    j. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.

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

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow 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 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 business days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and upload to eComm for Architectural / Engineer review.

2. Name file with submittal number or other unique identifier, including revision identifier.

    a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).

3. Contractor's review and approval markings and action taken by Architect shall be utilized through eComm.

E. Options: Identify options requiring selection by Architect.

F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect.

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

I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Submit electronic submittals via email as PDF electronic files up to a 2MB file size limit. Utilize online drop-box (i.e. WeTransfer, Dropbox, etc.) for files larger than the 2MB email file size limit.

    a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
3. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
4. Certificates and Certifications Submittals: Provide a 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.

    a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
    b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

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 published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's product specifications.
    b. Standard color charts.
    c. Statement of compliance with specified referenced standards.
    d. Testing by recognized testing agency.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams showing factory-installed wiring.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:

    a. PDF electronic file.
    b. Three paper copies of Product Data unless otherwise indicated. Architect will return two copies.

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. Identification of products.
    b. Compliance with specified standards.
    c. Notation of coordination requirements.
    d. Notation of dimensions established by field measurement.
    e. Relationship and attachment to adjoining construction clearly indicated.
    f. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
3. Submit Shop Drawings in the following format:

    a. PDF electronic file.

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 applicable Specification Section.
    e. Specification paragraph number and generic name of each item.

3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.

4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.

1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."

F. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."

G. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

H. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."

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

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

K. Installer Certificates: Submit 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.

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

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: 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 via eComm.

B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."

C. 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. 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 via eComm.

B. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

C. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review via eComm.

D. Submittals not required by the Contract Documents may be returned by the Architect without action via eComm.

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.

C. Related Requirements:

1. Section 012100 "Allowances" for testing and inspecting allowances.

1.3 DEFINITIONS

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

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

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.

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

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

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

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

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

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

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

1.4 CONFLICTING REQUIREMENTS

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

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum

within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 INFORMATIONAL SUBMITTALS

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

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice of Award, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

1. Project quality-control manager shall not have other Project responsibilities.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

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

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices,

receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

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

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

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

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

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

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

    1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

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

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

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

1.9 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.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

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

3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/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.

F. Testing Agency Responsibilities: Cooperate with Architect, Commissioning Authority and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect, Commissioning Authority, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. 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.

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

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

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

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

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
2. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
3. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
4. Retesting and reinspecting corrected work.
5. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with a copy to Contractor and to authorities having jurisdiction..

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, Commissioning Authority's, reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

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 014000

SECTION 014200– STRUCTURAL SPECIAL INSPECTIONS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Special inspections as defined in Section 1704 of The Kentucky Building Code are required.

B. The Inspection Agency shall conduct inspections under the supervision of a qualified professional engineer licensed in the State of Kentucky (Special Inspector).

C. Seismic Design Category for the structure is shown in the General Notes section of the structural drawings.

D. Special inspections are required for the following materials and work:

1. Inspection of Fabricators per Section 1704.2.5 of the Kentucky Building Code.
2. Steel Construction per Section 1705.2 of the Kentucky Building Code.
3. Concrete Construction per Section 1705.3 of the Kentucky Building Code.
4. Masonry Construction per Section 1705.4 of the Kentucky Building Code.
5. Prepared Fill per Section 1705.6 of the Kentucky Building Code.

1.3 SELECTION AND PAYMENT

A. The Inspection Agency shall be EMPLOYED by the owner . The Inspection Agency will be responsible for providing all Structural Special Inspection (including testing as listed herein) – scope of work may not be broken into separate contracts with multiple firms.

B. Special inspections are additional to testing and inspection requirements shown elsewhere in the specifications and on the drawings, which is to be paid for by the General Contractor and is not part of the SPECIAL INSPECTION services. The General Contractor shall also pay for additional structural testing and inspection required for his convenience. Inspection work not part of the Structural Special Inspections may be performed by an Inspection Agency of the Contractor's choosing, unless noted otherwise.

C. Costs for reinspection and retesting, should discrepancies be found, will be paid for buy the owner, as part of the Special Inspection Services, except where rework is due to negligence or omission deemed excessive by the Owner.

1. In case of excessive rework, such retesting and reinspection shall be paid for by the General Contractor as an additional service of the Inspection Agency.

2. In case of excessive waste/lost time of the Special Inspector due to inadequate scheduling by the General Contractor, such time shall be paid for by the General Contractor as an additional service of the Inspection Agency.

1.4 QUALITY ASSURANCE

A. Qualified Certification Authorities: Subject to compliance with Kentucky Building Code Requirements, Qualified Certification Authorities providing certification which may be applicable to Project include:

1. American Concrete Institute (ACI).
2. American Institute of Steel Construction (AISC).
3. American Welding Society (AWS).
4. National Institute of Certified Engineering Technology (NICET).
5. Steel Joist Institute (SJI).

B. Each inspector performing work on the Project shall be qualified to perform inspections for the particular type of construction or operation requiring special inspection by a Qualified Certification Authority as defined in the Kentucky Building Code. "Qualification" for purposes of this section shall mean a certified professional where certification in that jurisdiction exists. Subject to compliance with Kentucky Building Code requirements, Qualified Certification Authorities providing certification which may be applicable to Project include, but are not limited to, the following:

1. Steel Construction

a. Material verifications, bolted connections, visual observation of welds – AWS Level 1.
b. Steel frame connection details – Professional Engineer licensed in the State of Kentucky with experience in the design of building structures.

2. Concrete Construction

a. Use of design mix – ACI Level 2.
b. Material verifications, sampling of fresh concrete – NICET Level 1 (concrete).
c. Reinforcing inspection – NICET Level 2 (concrete).

3. Soils and Rock Bearing Materials

a. NICET Level 2 (soils).

C. Prior to any construction, Inspection Agency shall submit list of personnel who may provide inspection work on project. List shall include the name and certification level (qualification) of each inspector. List shall also include the name and professional engineering registration number of the Special Inspector and the Professional Engineer with experience in the design of building structures.

D. The Inspection Agency shall carry professional liability insurance for errors and omissions to a minimum limit of $1,000,000 per occurrence and shall submit certificate of insurance along with the qualifications to the Architect and Engineer.

E. Special Inspector Qualifications: A professional engineer who is legally authorized to practice in the State of Kentucky and who is experienced in providing testing and inspection services of structure system types similar to this Project in material, design, and extent.

PART 2 – EXECUTION

2.1 PROGRESS MEETINGS

A. The Special Inspector shall attend any pre-construction meetings which may be conducted at the construction site by the Structural Engineer to discuss quality issues.

B. The Special Inspector shall attend construction progress meetings which will be held at the construction site by the Architect, Engineer, and General Contractor.

2.2 CONTRACTOR'S RESPONSIBILITIES

A. Coordinate with the Inspection Agency to provide inspection and testing services.

B. Provide a complete copy all structural shop drawings to the Structural Testing/Inspection Agency.

C. Arrange the preconstruction meeting to discuss quality issues.

D. Notify the Structural Testing/Inspection Agency sufficiently in advance of operations to allow assignment of personnel and scheduling of tests.

E. Cooperate with Structural Testing/Inspection Agency and provide access, including equipment with operator, to work. Access equipment includes, but is not limited to, man lifts, excavation equipment, etc.

F. Provide samples of materials to be tested in required quantities.

G. Provide storage space for Structural Testing/Inspection Agency's exclusive use, such as for storing and curing concrete testing samples. If required by Special Inspector, General Contractor shall provide cure box with electricity, water, and blankets for curing concrete specimens.

H. Provide labor to assist the Structural Testing/Inspection Agency in performing tests/inspections. Labor includes, but is not limited to, construction of masonry prisms, etc.

I. Neither the observation of the Architect/Structural Engineer in the administration of the contract, nor tests/inspections by the Testing/Inspection Agency, nor approvals by persons other than the Architect/Structural Engineer shall relieve the Contractor from his obligation to perform the work in accordance with the Contract Documents.

2.3 SPECIAL INSPECTOR'S RESPONSIBILTIES

A. Cooperate with the Contractor and provide timely service.

B. Notify Contractor of minimum advance notice for each type of inspection/test.

C. Upon arriving at the construction site, sign in and notify the Contractor of presence.

D. Select the representative samples that are to be tested/inspected.

E. Perform tests/inspections as outlined in Contract Documents, the applicable codes, and as directed by the Structural Engineer.

F. Keep records of all inspections.

G. Furnish inspection reports to the Architect, Structural Engineer, and General Contractor weekly as construction progresses.

H. Inform General Contractor and / or Fabricator of all discrepancies immediately for correction.

1. Document in writing correction of discrepancies.
2. Highlight discrepancies within the report.
3. If discrepancies are not corrected, the discrepancies shall be brought to the attention of the Code Official and the Structural Engineer prior to the completion of that phase of the work.

I. Leave copies of field notes with the Contractor prior to leaving the construction site. Field notes shall include the message given to the Contractor, date, time of message, name of Contractor's representative informed, type and location of work or materials tested/inspected, whether the work or materials complies with Contract Documents and name of the Structural Testing/Inspection Agency's representative.

J. Immediately notify General Contractor, Architect, and Structural Engineer by separate letter if work yet to be inspected is found on site that is either being covered by other work or was to receive continuous inspection.

K. Structural Testing/Inspection Agency shall not alter requirements of Contract Documents, approve or reject any portion of the work, or perform duties of the Contractor.

L. Submit a final report of inspections documenting completion of **all** required Special Inspections and correction of any discrepancies noted in inspections to the Structural Engineer. Final report shall be prepared by, sealed, and signed by the Special Inspector and shall include a complete list of materials and work inspected during the course of the project.

1. Submit one complete set of all special inspection reports to Structural Engineer of Record with final report of special inspections. Report set shall be bound, divided by construction type, and in chronological order.

2.4 INSPECTION OF FABRICATORS

A. Inspect the fabrication of structural load-bearing members where such work is being performed on the premises of the Fabricator’s shop.

1. Fabricators shall be exempt from special inspection when a Qualified Certification Authority (as defined in section 1702 of The Kentucky Building Code) has periodically reviewed and approved Fabricator's written procedural and quality control manuals and fabrication practices. Subject to compliance with Kentucky Building Code requirements, Qualified Certification Authorities providing certification which may be applicable to Project include, but are not limited to, the following:

    a. Structural Steel Fabricators – AISC or AWS certified.
    b. Steel Joist Fabricators – SJI certified.

2. Fabricators exempt from special inspection shall submit a certificate of compliance to the structural engineer of record at the completion of fabrication stating that all work was completed in accordance with the approved construction documents.

B. Verify that the Fabricator maintains and review for completeness Fabricator's detailed fabrication and quality control procedures which provide a basis for control of the workmanship and ability to conform to the approved construction documents and reference standards.

C. Perform special inspections at Fabricator's shop as outlined in this specification for each type of construction.

2.5 INSPECTION OF STEEL CONSTRUCTION

A. Provide special inspection of the fabrication of steel structural elements and assemblies in accordance with the *Inspection of Fabricators*.

B. Verify that certification numbers on bolt, nut, and washer containers correspond to the identification numbers on mill test reports and that manufacturer's symbol and grade markings appear on all bolts and nuts. Also verify that bolts, nuts, and washers are being properly cared for at the site.

C. Verify that identification markings on structural steel members conform to ASTM standards specified on the approved construction documents.

D. Verify that identification markings on weld filler materials conform to ASTM standards specified on the approved construction documents. Also verify that weld filler material is being properly cared for.

E. Test and inspect high-strength bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A325 or A490 Bolts."

1. Perform periodic inspection of bearing type connections.
2. Perform continuous inspection of slip-critical type connections.
3. Verify that direct-tension indicator gaps comply with ASTM F 959, Table 2.
4. Verify that twist-off-type tension-control assemblies have been properly tightened.

F. Inspect and test welds during fabrication (where applicable) and erection of structural steel as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Inspect all weld procedures and welders according to the requirements of AWS D1.1-2000.
3. Use non-destructive testing according to AWS D1.1-2000, Section 6.11, on all welds that appear to have excessive inclusions, porosities, cracks, and incomplete penetrations as described by AWS D1.1-2000, or have the questionable weld removed and rewelded.
4. Perform continuous non-destructive testing according to AWS D1.1-2000, Section 6.11, on all complete penetration and/or partial penetration groove welds and on all splices of main members where those splices are required.
5. Perform continuous inspection according to AWS D1.1-2000, Section 6.9 (visual inspection) on all multi-pass fillet welds and on all single-pass fillet welds larger than 5/16”.
6. Perform periodic inspection according to AWS D1.1-2000, Section 6.9 (visual inspection) on all single-pass fillet welds smaller than 5/16” and on all floor, form, and roof deck welds.

G. Inspect all steel frame connection details for compliance with approved construction documents and approved steel erection shop drawings.

1. Verify completeness and construction of all bracing, stiffening, and connections.
2. Verify location, completeness and accuracy of all members.

2.6 INSPECTION OF CONCRETE CONSTRUCTION (including ICF walls)

A. Provide special inspection of the fabrication of concrete structural elements and assemblies in accordance with the *Inspection of Fabricators*.

B. Periodically verify the use of the proper design mix.

C. Verify use of proper grade and ASTM designation of reinforcing steels.

D. Perform periodic inspection on placement, spacing, clear cover, number, and splice lap lengths of reinforcing steel.

E. Monitor concrete quality by means of site and laboratory tests. The Inspection Agency is authorized to reject plastic concrete not conforming to specifications. Immediately inform the Contractor, the Architect and the Structural Engineer of inadequacies in concrete quality. Sampling and testing for quality control during concrete placement shall include the following:

1. Sampling Fresh Concrete: ASTM C 172.

a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.
d. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 25 cu. yd. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
3. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
4. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
5. Test results will be reported in writing to Architect, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

F. Perform continuous inspection of concrete placement to verify proper application techniques.

G. Perform periodic inspection of concrete curing procedures to verify maintenance of specified curing temperature, protection, and techniques.

H. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

I. Additional Tests: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing agency

may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

2.7 INSPECTION OF MASONRY CONSTRUCTION

A. At onset of masonry construction and periodically thereafter, verify proportions of site-prepared mortar, construction of mortar joints, and location of reinforcement and connectors.

B. Perform periodic inspection to verify size and location of structural elements; type, size, and location of anchors, including anchorage to other structural elements, frames, and construction; and specified size, grade, and type of reinforcement.

C. Prior to each grouting operation, verify cleanliness of grout space, placement of all reinforcement and connectors, including lap splice lengths, and proportions of site-prepared grout.

D. Perform continuous inspection of grout placement to verify compliance with contract document provisions.

E. Perform periodic inspection of masonry curing procedures to verify maintenance of specified curing temperature, protection, and techniques.

F. Sample and test grout compressive strength according to ASTM C 1019 and the following:

1. Compression Test Sample: one set of three standard cube specimens for each compressive-strength test, unless otherwise directed. Mold and store cubes for laboratory-cured test specimens except when field-cured test specimens are required.
2. Compressive-Strength Tests: one sample for each day’s grouting; one specimen tested at 7 days, one specimen tested at 28 days, and one specimen retained in reserve for later testing if required.

2.8 INSPECTION OF SOILS

A. Inspect the existing site soil conditions, fill placement, and load-bearing requirements for compliance with the recommendations of the approved geotechnical investigation report.

1. Where the site is specified to be undercut by the geotechnical investigation report, verify all existing uncontrolled fills have been removed from below applicable foundation elements to the specified depth.

B. Prior to placement of any engineered fill, determine that the site has been prepared in accordance with the recommendations of the approved geotechnical investigation report.

C. During placement and compaction of the engineered fill material, verify that the material being used, maximum lift thickness, and in-place dry density comply with the recommendations of the approved geotechnical report.

END OF SECTION 014200

SECTION 014300 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

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

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

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": 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.

1.3 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.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
8. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
9. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
10. AF&PA - American Forest & Paper Association; www.afandpa.org.
11. AGA - American Gas Association; www.aga.org.
12. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
13. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
14. AI - Asphalt Institute; www.asphaltinstitute.org.
15. AIA - American Institute of Architects (The); www.aia.org.
16. AISC - American Institute of Steel Construction; www.aisc.org.
17. AISI - American Iron and Steel Institute; www.steel.org.
18. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
19. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
20. ANSI - American National Standards Institute; www.ansi.org.
21. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
22. APA - APA - The Engineered Wood Association; www.apawood.org.
23. APA - Architectural Precast Association; www.archprecast.org.
24. API - American Petroleum Institute; www.api.org.
25. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
26. ARI - American Refrigeration Institute; (See AHRI).
27. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
28. ASCE - American Society of Civil Engineers; www.asce.org.
29. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
30. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
31. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
32. ASSE - American Society of Safety Engineers (The); www.asse.org.
33. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
34. ASTM - ASTM International; (American Society for Testing and Materials International); www.astm.org.
35. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
36. AWEA - American Wind Energy Association; www.awea.org.
37. AWI - Architectural Woodwork Institute; www.awinet.org.
38. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
39. AWPA - American Wood Protection Association; (Formerly: American Wood-Preservers' Association); www.awpa.com.
40. AWS - American Welding Society; www.aws.org.
41. AWWA - American Water Works Association; www.awwa.org.
42. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.

43. BIA - Brick Industry Association (The); www.gobrick.com.
44. BICSI - BICSI, Inc.; www.bicsi.org.
45. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.com.
46. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
47. BOCA - BOCA; (Building Officials and Code Administrators International Inc.); (See ICC).
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bwfbadminton.org.
49. CDA - Copper Development Association; www.copper.org.
50. CEA - Canadian Electricity Association; www.electricity.ca.
51. CEA - Consumer Electronics Association; www.ce.org.
52. CFFA - Chemical Fabrics & Film Association, Inc.; www.chemicalfabricsandfilm.com.
53. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
54. CGA - Compressed Gas Association; www.cganet.com.
55. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
56. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
57. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
58. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
59. CPA - Composite Panel Association; www.pbmdf.com.
60. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
61. CRRC - Cool Roof Rating Council; www.coolroofs.org.
62. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
63. CSA - Canadian Standards Association; www.csa.ca.
64. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
65. CSI - Construction Specifications Institute (The); www.csinet.org.
66. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
67. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
68. CWC - Composite Wood Council; (See CPA).
69. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
70. DHI - Door and Hardware Institute; www.dhi.org.
71. ECA - Electronic Components Association; www.ec-central.org.
72. ECAMA - Electronic Components Assemblies & Materials Association; (See ECA).
73. EIA - Electronic Industries Alliance; (See TIA).
74. EIMA - EIFS Industry Members Association; www.eima.com.
75. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
76. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
77. ESTA - Entertainment Services and Technology Association; (See PLASA).
78. EVO - Efficiency Valuation Organization; www.evo-world.org.
79. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
80. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
81. FM Approvals - FM Approvals LLC; www.fmglobal.com.
82. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
83. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridaroof.com.
84. FSA - Fluid Sealing Association; www.fluidsealing.com.
85. FSC - Forest Stewardship Council U.S.; www.fscus.org.
86. GA - Gypsum Association; www.gypsum.org.
87. GANA - Glass Association of North America; www.glasswebsite.com.
88. GS - Green Seal; www.greenseal.org.
89. HBC – KY Department of Housing and Building Construction
90. HI - Hydraulic Institute; www.pumps.org.
91. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
92. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).

93. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
94. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
95. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
96. IAS - International Approval Services; (See CSA).
97. ICBO - International Conference of Building Officials; (See ICC).
98. ICC - International Code Council; www.iccsafe.org.
99. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
100. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
101. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
102. IEC - International Electrotechnical Commission; www.iec.ch.
103. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
104. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
105. IESNA - Illuminating Engineering Society of North America; (See IES).
106. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
107. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
108. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
109. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
110. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
111. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
112. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
113. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
114. ISO - International Organization for Standardization; www.iso.org.
115. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
116. ITU - International Telecommunication Union; www.itu.int/home.
117. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
118. KTC - Kentucky Transportation Cabinet
119. KYDOW – Kentucky Division of Water
120. LMA - Laminating Materials Association; (See CPA).
121. LPI - Lightning Protection Institute; www.lightning.org.
122. MBMA - Metal Building Manufacturers Association; www.mbma.com.
123. MCA - Metal Construction Association; www.metalconstruction.org.
124. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
125. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
126. MHIA - Material Handling Industry of America; www.mhia.org.
127. MIA - Marble Institute of America; www.marble-institute.com.
128. MMPA - Moulding & Millwork Producers Association; (Formerly: Wood Moulding & Millwork Producers Association); www.wmmpa.com.
129. MPI - Master Painters Institute; www.paintinfo.com.
130. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
131. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
132. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
133. NADCA - National Air Duct Cleaners Association; www.nadca.com.
134. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
135. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
136. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
137. NCMA - National Concrete Masonry Association; www.ncma.org.
138. NEBB - National Environmental Balancing Bureau; www.nebb.org.
139. NECA - National Electrical Contractors Association; www.necanet.org.
140. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
141. NEMA - National Electrical Manufacturers Association; www.nema.org.

142. NETA - InterNational Electrical Testing Association; www.netaworld.org.
143. NFHS - National Federation of State High School Associations; www.nfhs.org.
144. NFPA - NFPA; (National Fire Protection Association); www.nfpa.org.
145. NFPA - NFPA International; (See NFPA).
146. NFRC - National Fenestration Rating Council; www.nfrc.org.
147. NHLA - National Hardwood Lumber Association; www.nhla.com.
148. NLGA - National Lumber Grades Authority; www.nlga.org.
149. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
150. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
151. NRCA - National Roofing Contractors Association; www.nrca.net.
152. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
153. NSF - NSF International; (National Sanitation Foundation International); www.nsf.org.
154. NSPE - National Society of Professional Engineers; www.nspe.org.
155. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
156. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
157. NWFA - National Wood Flooring Association; www.nwfa.org.
158. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
159. PDI - Plumbing & Drainage Institute; www.pdionline.org.
160. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
161. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
162. RFCI - Resilient Floor Covering Institute; www.rfci.com.
163. RIS - Redwood Inspection Service; www.redwoodinspection.com.
164. SAE - SAE International; (Society of Automotive Engineers); www.sae.org.
165. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
166. SDI - Steel Deck Institute; www.sdi.org.
167. SDI - Steel Door Institute; www.steeldoor.org.
168. SEFA - Scientific Equipment and Furniture Association; www.sefalabs.com.
169. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
170. SIA - Security Industry Association; www.siaonline.org.
171. SJI - Steel Joist Institute; www.steeljoist.org.
172. SMA - Screen Manufacturers Association; www.smainfo.org.
173. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
174. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
175. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
176. SPIB - Southern Pine Inspection Bureau; www.spib.org.
177. SPRI - Single Ply Roofing Industry; www.spri.org.
178. SRCC - Solar Rating and Certification Corporation; www.solar-rating.org.
179. SSINA - Specialty Steel Industry of North America; www.ssina.com.
180. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
181. STI - Steel Tank Institute; www.steeltank.com.
182. SWI - Steel Window Institute; www.steelwindows.com.
183. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
184. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
185. TCNA - Tile Council of North America, Inc.; (Formerly: Tile Council of America); www.tileusa.com.
186. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
187. TIA - Telecommunications Industry Association; (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
188. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
189. TMS - The Masonry Society; www.masonrysociety.org.
190. TPI - Truss Plate Institute; www.tpinst.org.

191. TPI - Turfgrass Producers International; www.turfgrasssod.org.
192. TRI - Tile Roofing Institute; www.tileroofing.org.
193. UBC - Uniform Building Code; (See ICC).
194. UL - Underwriters Laboratories Inc.; www.ul.com.
195. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
196. USAV - USA Volleyball; www.usavolleyball.org.
197. USGBC - U.S. Green Building Council; www.usgbc.org.
198. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
199. WASTEC - Waste Equipment Technology Association; www.wastec.org.
200. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
201. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
202. WDMA - Window & Door Manufacturers Association; www.wdma.com.
203. WI - Woodwork Institute; (Formerly: WIC - Woodwork Institute of California); www.wicnet.org.
204. WMMPA - Wood Moulding & Millwork Producers Association; (See MMPA).
205. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
206. WPA - Western Wood Products Association; www.wwpa.org.

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up-to-date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; http://dodssp.daps.dla.mil.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; http://eetd.lbl.gov.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeia; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from Department of Defense Single Stock Point; http://dodssp.daps.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from Department of Defense Single Stock Point; http://dodssp.daps.dla.mil.

    a. Available from Defense Standardization Program; www.dsp.dla.mil.
    b. Available from General Services Administration; www.gsa.gov.
    c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.

6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CBHF - State of California; Department of Consumer Affairs; Bureau of Electronic Appliance and Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
2. CCR - California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
3. CDHS - California Department of Health Services; (See CDPH).
4. CDPH - California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
5. CPUC - California Public Utilities Commission; www.cpuc.ca.gov.
6. SCAQMD - South Coast Air Quality Management District; www.aqmd.gov.
7. TFS - Texas Forest Service; Forest Resource Development and Sustainable Forestry; http://txforestservice.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014300

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

B. Water, Electric and Sewer Service from Existing System: Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

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

B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.

1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

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.

C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to 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. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch-(3.8-mm-)thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch-(60-mm-)OD line posts and 2-7/8-inch-(73-mm-) OD corner and pull posts, with galvanized barbed-wire top strand.

B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).

C. 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: Not required.

B. Common-Use Field Office: Not required.

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

1. Store combustible materials apart from building.

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: Unless Owner authorizes use of permanent HVAC system, 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 qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
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 and clean HVAC system as required in Section 017700 "Closeout Procedures"

2.4 PROJECT IDENTIFICATION SIGN

A. Erect and maintain until completion of project, a project sign on site. Location to be determined by the architect. Sign shall be 4 feet tall by 8 feet wide of exterior signboard plywood (or metal), with edge trim and wood supports. Sign shall stand no more than 10’-0” above the grade to the top of the sign. Sign shall be as detailed at the end of this specification section.

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.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

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: 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.

B. Sewers and Drainage: Connect to existing sewer system to remove effluent lawfully.

1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. Existing water service must be maintained during and after the project.

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

E. 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.

F. 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.

1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

G. Electric Power Service: Connect to Owner’s existing electric power service. Existing electric power service must be maintained during and after the project.

1. Install electric power service overhead unless otherwise indicated.
2. Connect temporary service to Owner's existing power source, as directed by Owner.

H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
2. Install lighting for Project identification sign.

I. Telephone Service: Cellular phones are acceptable. Provide cell phone number for Jobsite Superintendent to Owner and Architect.

1. At the jobsite office, post a list of important telephone numbers.

a. Police and fire departments.
b. Ambulance service.
c. Architect's office.
d. Engineers' offices.
e. Owner's office.
f. Principal subcontractors' field and home offices.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

C. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

D. 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.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

E. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.

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

G. 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; manage fire-prevention program.

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.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.4 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

B. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.

5. Do not install material that is wet.
6. Discard, replace, or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

C. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use permanent HVAC system to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

    a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective.
    b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
    c. Remove materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.5 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. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.

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

E. 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. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

SECTION 015713 - TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Performance bond.

E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

F. In general, the section includes all of the sediment and erosion control items needed to satisfy the regulatory authorities and may include, but not be limited to the following:

G. The Contractor Shall:
   1. Sign and obtain the Notice of Intent.
   2. Prepare and maintain a Best Management Practice Plan (BMP).
   3. Termination of the Notice of Intent.

1.02 RELATED SECTIONS

A. Section "Earthwork" for installation of the erosion and sediment control items.

1.03 RELATED DOCUMENTS

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

B. Related Documents: Documents affecting work of this section include but are not necessary limited to Kentucky Storm Water General Permit, Kentucky Erosion Prevention and Sediment Control Field Guide.

1.04 RELATED REQUIREMENTS

A. RELATED REQUIREMENTS
   1. Section 311000 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.
   2. Section 312200 - Grading: Temporary and permanent grade changes for erosion control.
   3. Section 313700 - Riprap: Temporary and permanent stabilization using riprap.
   4. Section 321123 - Aggregate Base Courses: Temporary and permanent roadways.
   5. Section 329219 - Seeding: Permanent turf for erosion control.
   6. Section 329223 - Sodding: Permanent turf for erosion control.
   7. Section 329300 - Plants: Permanent plantings for erosion control.

B. REFERENCE STANDARDS
   1. ASTM D 4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus; 2007.
   2. ASTM D 4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 1999a (Reapproved 2004).
   3. ASTM D 4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2004.
   4. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2008.
   5. ASTM D 4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile; 2004.

6. ASTM D 4873 - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2002.
7. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; current edition.
8. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control; Federal Highway Administration; 1995.
9. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 1986.

1.05 PERFORMANCE REQUIREMENTS

A. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control, as specified for the National Pollutant Discharge Elimination System (NPDES), Phases I and II, under requirements for the 2003 Construction General Permit (CGP), whether the project is required by law to comply or not.

B. Also comply with all more stringent requirements of State of Kentucky Erosion and Sedimentation Control Manual.

C. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

D. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.

E. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.

F. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

G. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
   2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.

H. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
   1. Control movement of sediment and soil from temporary stockpiles of soil.
   2. Prevent development of ruts due to equipment and vehicular traffic.
   3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

I. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

J. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.

1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

K. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

L. Open Water: Prevent standing water that could become stagnant.

M. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.06 SUBMITTALS

A. NOI: Submit NOI to KPDES Branch, Division of Water, per attached instructions. A copy of the submitted NOI form shall be sent to the Architect and the Owner.

B. BMP: Submit BMP to appropriate regulatory agency. A copy shall be sent to the Architect and the Owner.

C. Subcontractor Signatures: Signatures of all subcontractors for approval stating that they have read, understand and that they intend to comply with the BMP. A copy of the signatures shall be submitted to the Architect and the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Mulch: Use one of the following:
1. Straw or hay.
2. Wood waste, chips, or bark.
3. Erosion control matting or netting.
4. Cutback asphalt.
5. Polyethylene film, where specifically indicated only.

B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

C. Bales: Air dry, rectangular straw bales.
1. Cross Section: 14 by 18 inches, minimum.
2. Bindings: Wire or string, around long dimension.

D. Bale Stakes: One of the following, minimum 3 feet long:
1. Steel U- or T-section, with minimum mass of 1.33 lb per linear foot.
2. Wood, 2 by 2 inches in cross section.

E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D 4751.
2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D 4491.
3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D 4355 after 500 hours exposure.
4. Tensile Strength: 100 lb-f, minimum, in cross-machine direction; 124 lb-f, minimum, in

machine direction; when tested in accordance with ASTM D 4632.
5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D 4632.
6. Tear Strength: 55 lb-f, minimum, when tested in accordance with ASTM D 4533.
7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
8. Manufacturers:

F. Silt Fence Posts: One of the following, minimum 5 feet long:

G. Gravel: See Section 321123 for aggregate.

PART 3 - EXECUTION

3.01 Continuous Service: The sediment and erosion control items are to be installed prior to the commencement of all other construction activities on site. Continuous maintenance shall be required until the next contract has been signed. To transfer the Notice of Intent, a letter is to be written and signed by the new contractor. Once this letter has been received and approved by the Division of Water the Contractor's responsibility shall be relieved.

3.02 Prepare Daily Field Reports per BMP requirements. A sample form is attached. Submit to regulatory agency as required.

3.03 Prepare Erosion and Sediment Control Inspection and Maintenance Report Form weekly per BMP requirements. A sample form is attached. Submit to regulatory agency as required.

3.04 Remove temporary erosion sediment control measures when site is 95% stabilized. Seed and protect any disturbed areas with permanent grass protect mixture.

3.05 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.06 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.07 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
1. Width: As required; 20 feet, minimum.
2. Length: 50 feet, minimum.
3. Provide at each construction entrance from public right-of-way.
4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.
1. Provide linear sediment barriers:
   a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
2. Space sediment barriers with the following maximum slope length upslope from barrier:
   a. Slope of Less Than 2 Percent: 100 feet..
   b. Slope Between 2 and 5 Percent: 75 feet.
   c. Slope Between 5 and 10 Percent: 50 feet.
   d. Slope Between 10 and 20 Percent: 25 feet.
   e. Slope Over 20 Percent: 15 feet.

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:

1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Soil Stockpiles: Protect using one of the following measures:
1. Cover with polyethylene film, secured by placing soil on outer edges.
2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.

H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
2. Asphalt: Use only where no traffic, either vehicular or pedestrian, is anticipated.

I. Temporary Seeding: Use where temporary vegetated cover is required.

3.08 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
1. Excavate minimum of 6 inches.
2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
3. Place and compact at least 6 inches of 1.5 to 3.5 inch diameter stone.

B. Silt Fences:
1. Store and handle fabric in accordance with ASTM D 4873.
2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
5. Install with top of fabric at nominal height and embedment as specified.
6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
7. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

C. Straw Bale Rows:
1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
2. Install bales so that bindings are not in contact with the ground.
3. Embed bales at least 4 inches in the ground.
4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
5. Fill gaps between ends of bales with loose straw wedged tightly.
6. Place soil excavated for trench against bales on the upslope side of the row, compacted.

D. Temporary Seeding:
1. When hydraulic seeder is used, seedbed preparation is not required.

2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
5. Incorporate fertilizer into soil before seeding.
6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep deep.
7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
8. Repeat irrigation as required until grass is established.

3.09 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:
1. Promptly replace fabric that deteriorates unless need for fence has passed.
2. Remove silt deposits that exceed one-third of the height of the fence.
3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Straw Bale Rows:
1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
2. Remove silt deposits that exceed one-half of the height of the bales.
3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

E. Clean out temporary sediment control structures weekly and relocate soil on site.

F. Place sediment in appropriate locations on site; do not remove from site.

3.10 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION 015713

SECTION 015723 - TEMPORARY STORM WATER POLLUTION CONTROL

1.1 SUMMARY

A. Section Includes:

1. Temporary stormwater pollution controls.

1.2 STORMWATER POLLUTION PREVENTION PLAN

A. The contractor is responsible for the Storm Water Pollution Prevention Plan. The Stormwater Pollution Prevention Plan (SWPPP) is part of the Contract Documents and is bound into this Project Manual.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Stormwater Pollution Prevention Plan (SWPP): Within **15** days of date established for commencement of the Work, submit completed SWPPP.

B. EPA authorization under the EPA's "2017 Construction General Permit (CGP)."

C. Stormwater Pollution Prevention (SWPP) Training Log: For each individual performing Work under the SWPPP.

D. Inspection reports.

1.5 QUALITY ASSURANCE

A. Stormwater Pollution Prevention Plan (SWPPP) Coordinator: Experienced individual or firm with a record of successful water pollution control management coordination of projects with similar requirements.

1. SWPPP Coordinator shall complete and finalize the SWPPP form.
2. SWPPP Coordinator shall be responsible for inspections and maintaining of all requirements of the SWPPP.

B. Installers: Trained as indicated in the SWPPP.

PART 2 - PRODUCTS

2.1 TEMPORARY STORMWATER POLLUTION CONTROLS

A. Provide temporary stormwater pollution controls as required by the SWPPP.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with all best management practices, general requirements, performance requirements, reporting requirements, and all other requirements included in the SWPPP.

B. Locate stormwater pollution controls in accordance with the SWPPP.

C. Conduct construction as required to comply with the SWPPP and that minimize possible contamination or pollution or other undesirable effects.

1. Inspect, repair, and maintain SWPPP controls during construction.

a. Inspect all SWPPP controls not less than every seven days, and after each occurrence of a storm event, as outlined in the SWPPP.

D. Remove SWPPP controls at completion of construction and restore and stabilize areas disturbed during construction.

END OF SECTION 015723

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 012500 "Substitution Procedures" for requests for substitutions.
2. Section 014200 "References" for applicable industry standards for products specified.

1.3 DEFINITIONS

A. Products: Items obtained 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. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," 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 additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

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

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. 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 seven days of receipt of additional information or documentation, whichever is later.

    a. Form of Approval: As specified in Section 013300 "Submittal Procedures."
    b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

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

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. 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 determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 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: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, 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. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Products:

a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered prior to bid date.

2. Manufacturers:

   a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered prior to bid date.

3. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated 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 requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

2.2 COMPARABLE PRODUCTS

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

1. Evidence that the proposed product does not require 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 016000

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Installation of the Work.
2. Progress cleaning.
3. Protection of installed construction.

B. Related Requirements:

1. Section 011000 "Summary" for limits on use of Project site.
2. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 QUALITY ASSURANCE

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

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, 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. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

B. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

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

3.2 PREPARATION

A. 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.

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

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 INSTALLATION

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

1. Make vertical work plumb and make horizontal work level.

2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.

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. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. 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.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

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.

I. 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.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three 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.

    a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

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: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

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.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

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

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

END OF SECTION 017300

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.

B. Related Requirements:

1. Section 017300 "Execution" for progress cleaning of Project site.
2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit test/adjust/balance records.
5. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Complete startup and testing of systems and equipment.
3. Perform preventive maintenance on equipment used prior to Substantial Completion.
4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
5. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
6. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
7. Complete final cleaning requirements, including touchup painting.
8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization 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.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Page number.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

D. 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: Perform 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 designated 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. Remove tools, construction equipment, machinery, and surplus material from Project site.
c. 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.
d. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
e. Remove labels that are not permanent.
f. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
g. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
h. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.

i. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
j. Leave Project clean and ready for occupancy.

C. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls."

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Operation manuals for systems, subsystems, and equipment.
3. Product maintenance manuals.
4. Systems and equipment maintenance manuals.

B. Related Requirements:

1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
b. Enable inserted reviewer Comments on draft submittals.

2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.

C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

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 the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.

5. Name and contact information for Contractor.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.

3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Engineering data and tests.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUALS

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

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.

4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

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 and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.
6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

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.
2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

F. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Product Data.

B. Related Requirements:

1. Section 017700 "Closeout Procedures" for general closeout procedures.
2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT 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. Initial Submittal:

1) Submit one paper-copy set(s) of marked-up record prints.
2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

b. Final Submittal:

1) Submit one paper-copy set(s) of marked-up record prints.

B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one paper copy of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy of each submittal.

E. Reports: Submit written report indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Accurately record information in an acceptable drawing technique.
    c. Record data as soon as possible after obtaining it.
    d. Record and check the markup before enclosing concealed installations.
    e. Cross-reference record prints to corresponding archive photographic documentation.

2. Content: Types of items requiring marking include, but are not limited to, the following:

    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations below first floor.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Changes made by Change Order or Construction Change Directive.
    i. Changes made following Architect's written orders.
    j. Details not on the original Contract Drawings.
    k. Field records for variable and concealed conditions.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. 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. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect.
    e. Name of Contractor.

2.2 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, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as paper copy.

    1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

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 revisions to project record documents as they occur; do not wait until 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 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training video recordings.

B. Allowances: Furnish demonstration and training instruction time under the Demonstration and Training Allowance as specified in Section 012100 "Allowances."

C. Unit Price for Instruction Time: Length of instruction time will be measured by actual time spent performing demonstration and training in required location. No payment will be made for time spent assembling educational materials, setting up, or cleaning up. See requirements in Section 012200 "Unit Prices."

1.3 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.

1.4 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

    a. System, subsystem, and equipment descriptions.
    b. Performance and design criteria if Contractor is delegated design responsibility.
    c. Operating standards.
    d. Regulatory requirements.
    e. Equipment function.
    f. Operating characteristics.
    g. Limiting conditions.
    h. Performance curves.

2. Documentation: Review the following items in detail:

    a. Emergency manuals.
    b. Operations manuals.
    c. Maintenance manuals.
    d. Project record documents.
    e. Identification systems.
    f. Warranties and bonds.
    g. Maintenance service agreements and similar continuing commitments.

3. Operations: Include the following, as applicable:

    a. Startup procedures.
    b. Equipment or system break-in procedures.
    c. Routine and normal operating instructions.
    d. Regulation and control procedures.
    e. Control sequences.
    f. Safety procedures.
    g. Instructions on stopping.
    h. Normal shutdown instructions.
    i. Operating procedures for emergencies.
    j. Operating procedures for system, subsystem, or equipment failure.
    k. Seasonal and weekend operating instructions.
    l. Required sequences for electric or electronic systems.
    m. Special operating instructions and procedures.

4. Adjustments: Include the following:

    a. Alignments.
    b. Checking adjustments.
    c. Noise and vibration adjustments.
    d. Economy and efficiency adjustments.

5. Maintenance: Include the following:

    a. Inspection procedures.
    b. Types of cleaning agents to be used and methods of cleaning.
    c. List of cleaning agents and methods of cleaning detrimental to product.
    d. Procedures for routine cleaning
    e. Procedures for preventive maintenance.
    f. Procedures for routine maintenance.
    g. Instruction on use of special tools.

6. Repairs: Include the following:

    a. Diagnosis instructions.
    b. Repair instructions.
    c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
    d. Instructions for identifying parts and components.
    e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Architect will furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
2. Owner will furnish an instructor to describe Owner's operational philosophy.
3. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner, through Architect, with at least seven days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 017900

SPENCER COUNTY BOARD OF EDUCATION
OFFICE ADDITION AND RENOVATION

PROJECT MANUAL – VOLUME 2

Spencer County Board of Education
Office Additiona and Renovation
SCB 2448 / BG #25-166

February 26, 2025

OWNER
Spencer County Board of Education
Taylorsville, Kentucky

SUPERINTENDENT – Dr. William Foster

ARCHITECT

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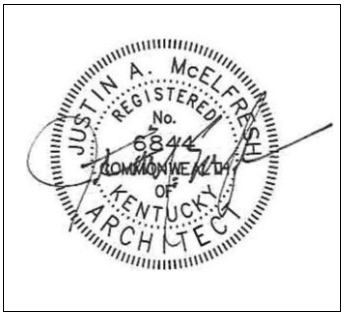

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SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
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Unless noted otherwise, the following shall apply to all manufacturers listed herein. Subject to compliance with Contract Documents, manufactures listed are approved as a manufacturer only. This does not imply that specific products supplied by such manufacturers have been reviewed and comply with requirements. It shall be the manufacturer's / contractor's responsibility to ensure that all requirements of the Contract Documents are met.

DIVISION 9 - FINISHES

09 22 16 NON-STRUCTURAL METAL FRAMING
09 26 50 GYPSUM BOARD SHAFT-WALL ASSEMBLIES
09 29 00 GYPSUM BOARD
09 51 13 ACOUSTICAL PANEL CEILINGS

DIVISION 10 - SPECIALTIES

10 14 23 PANEL SIGNAGE
10 28 00 TOILET, BATH, AND LAUNDRY ACCESSORIES
10 44 00 FIRE-PROTECTION SPECIALITIES
10 53 00 ALUMINUM PROTECTIVE CANOPIES

DIVISION 11 - EQUIPMENT

11 17 00 TRANSACTION WINDOWS WITH DEAL TRAYS

DIVISION 12 - FURNISHINGS

NOT USED

DIVISION 13 – N/A

DIVISION 14 – N/A

SECTION 023200 - GEOTECHNICAL INVESTIGATION AND REPORT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Definitions:

a. Geotechnical Report – The entire document provided by “Vector Engineers,Inc ” titled “Report of Geotechnical Subsurface Characterization” Spencer County Schools Improvements dated December 9, 2024. The geotechnical report typically includes, but not limited to, a summary and methods of the exploration, site description, site geology, subsurface conditions, boring logs, and recommendations for the project.

b. Geotechnical exploration / investigation – The physical act by the geotechnical engineer of taking samples in the field and testing samples in the laboratory to obtain the data required to write the report and provide recommendation.

c. Geotechnical recommendations – the portion of the geotechnical report that provides project specific design and construction recommendations. This includes, but not limited to, site grading, site drainage, utility and foundation excavations, site preparation, structural fill placement, foundation recommendations, floor slab recommendations, and pavement recommendations.

B. Geotechnical report and recommendations:

1. The **geotechnical report** in regards to existing sub-surface conditions, existing site descriptions, and geology is included for information only.

2. The **geotechnical recommendations** in the report **ARE** a part of the contract documents, unless specifically noted otherwise.

3. The term “Geotechnical recommendations” does **NOT** refer to the entire report.

B. Use of data:

1. This **subsurface investigation and report** was obtained only for the Architect/ Engineer use in design and is not a part of the Contract Documents.

2. The Architect/Engineer/Owner takes no responsibility for the conclusions that individual contractors may reach upon review

3. The **subsurface investigation and report** is available for bidders' information, but is not a warranty of subsurface conditions.

4. Bidders should visit the site and acquaint themselves with existing conditions.

5. Prior to bidding, bidders may make their own subsurface investigations to satisfy themselves as to site and subsurface conditions.

1.2 QUALITY ASSURANCE

A. A geotechnical engineer will be retained by the Owner to observe performance of work in connection with excavating, trenching, filling, backfilling, and grading, and to perform compaction tests.

B. The Subcontractor shall re-adjust work performed that does not meet technical or design requirements, but make no deviation from the Contract Documents without specific and written approval from the Architect/Engineer.

END OF SECTION 023200

REPORT OF GEOTECHNICAL SUBSURFACE CHARACTERIZATION

SPENCER COUNTY SCHOOLS IMPROVEMENTS
TAYLORSVILLE, KENTUCKY

PROJECT: 24050104SHE

DECEMBER 9 , 2024

PREPARED FOR:
POAGE ENGINEERS & ASSOCIATES
880 SPARTA COURT, SUITE 200
LEXINGTON, KY 40504

BY:
VECTOR ENGINEERS, INC
A SUBSIDIARY OF CTL ENGINEERING, INC

VECTOR ENGINEERS, INC
GEOTECHNICAL · MATERIALS · GEOSCIENCES
A SUBSIDIARY OF CTL ENGINEERING, INC

December 9, 2024

Mr. Steven Rucker
Spencer County Board of Education
110 Reasor Avenue
Taylorsville, Kentucky
steven.rucker@spencer.kyschools.us

c/o Mr. Brian Scott, PE
Poage Engineers & Associates
880 Sparta Court, Suite 200
Lexington, KY 40504
bscott@poageengineers.com

Subject: Report of Geotechnical Subsurface Characterization
Spencer County Schools Improvements
Taylorsville, Kentucky
Vector Project 24050104SHE

Dear Mr Rucker,

VECTOR Engineers, Inc., has completed the geotechnical subsurface characterization for the proposed improvements at the Board of Education Building and the Family Empowerment Center. This exploration was in general accordance with our proposal 24050085SHEPPL, dated November 1, 2024, which was accepted by Mr. Brian Scott, PE with Poage Engineers & Associates. The purpose of this exploration was to obtain subsurface data to develop site preparation and foundation recommendations for the proposed development. This report describes our understanding of the project, summarizes our findings, discusses the geotechnical concerns, and contains our engineering recommendations.

We have not completed the laboratory testing for the project. After the testing is completed, Vector will issue an addendum to the report. Vector is confident in our visual classification of the soils; therefore, we do not anticipate the results of the laboratory test will change our recommendations.

PROJECT INFORMATION

Project information was provided to us through correspondence with Brian Scott with Poage Engineers. We have been provided with the following documents:

- *Request for Proposal* [RFP], prepared by Poage Engineers, dated October 29, 2024
- Site layout drawing with proposed boring locations was included in the RFP, undated

Based on these drawings, we understand that Spencer County Board of Education plans to make several improvements to the existing facilities at 106 and 110 Reasor Avenue, Taylorsville, Kentucky. Along with the building improvements we also understand that new asphalt parking lots will also be developed. For both additions, structural loads are expected to be 50 kips per column and 3 kips per linear foot (klf) of

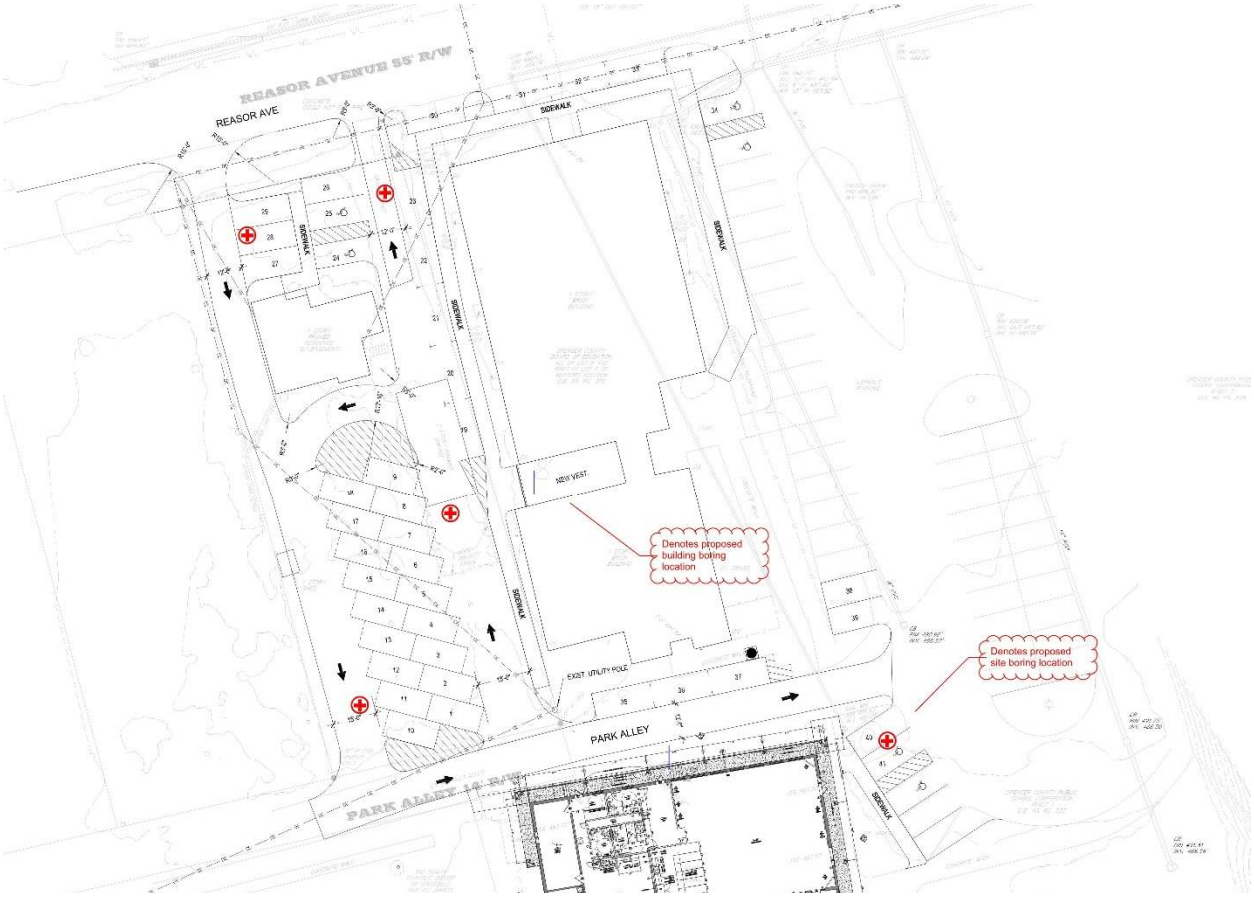


Figure 1: Site lay out drawing showing proposed parking lots, canopy, vestibule and boring locations.

load bearing wall. We have assumed settlement tolerances of 1 inch total and ¾-inches differential between columns for the proposed structures.

Family Empowerment Center and Vestibule Additions

The first addition will be a 1,200 square-foot, metal canopy at the Family Empowerment center. The renovations for the building will also include some masonry headers and new non-load-bearing masonry walls. The second addition will be an approximately 600 square-foot vestibule addition. The vestibule will consist of steel framing with moment connections and metal decking.

Parking Lots

Two new asphalt parking lots with associated drive lanes are proposed on the lot immediately west of the Board of Education Building. The first lot will have six spaces and will be located north of the future Diverse Learning Center. The second lot will be south of the Diverse Learning Center and will have 18 spaces. The lots will be light-duty, asphalt pavements. We have assumed the traffic will be less than 35,000 ESALs over 20 years. No rigid (concrete) pavements were identified.

Park Alley, located south of the Board of Education building will also be resurfaced and improved. Park Alley is a pick-up and drop-off lane for the Spencer County Early Learning Center (SCELC). Our estimated traffic loading is based on our on-site observations and conversations with BOE staff. For our pavement analysis, we estimated the daily traffic on Park Alley as:

- 200 school days per year
- 10 School Buses per school day
- 200 cars per school day
- 300 pickup trucks and vans per school day
- 5 delivery package delivery trucks per weekday
- 1 garbage truck twice a week
- 20 year life equivalent to 40,000 ESALs[1]

[1] ESAL stands for equivalent single axle load, and it's a standardized vehicle loading used in highway design.

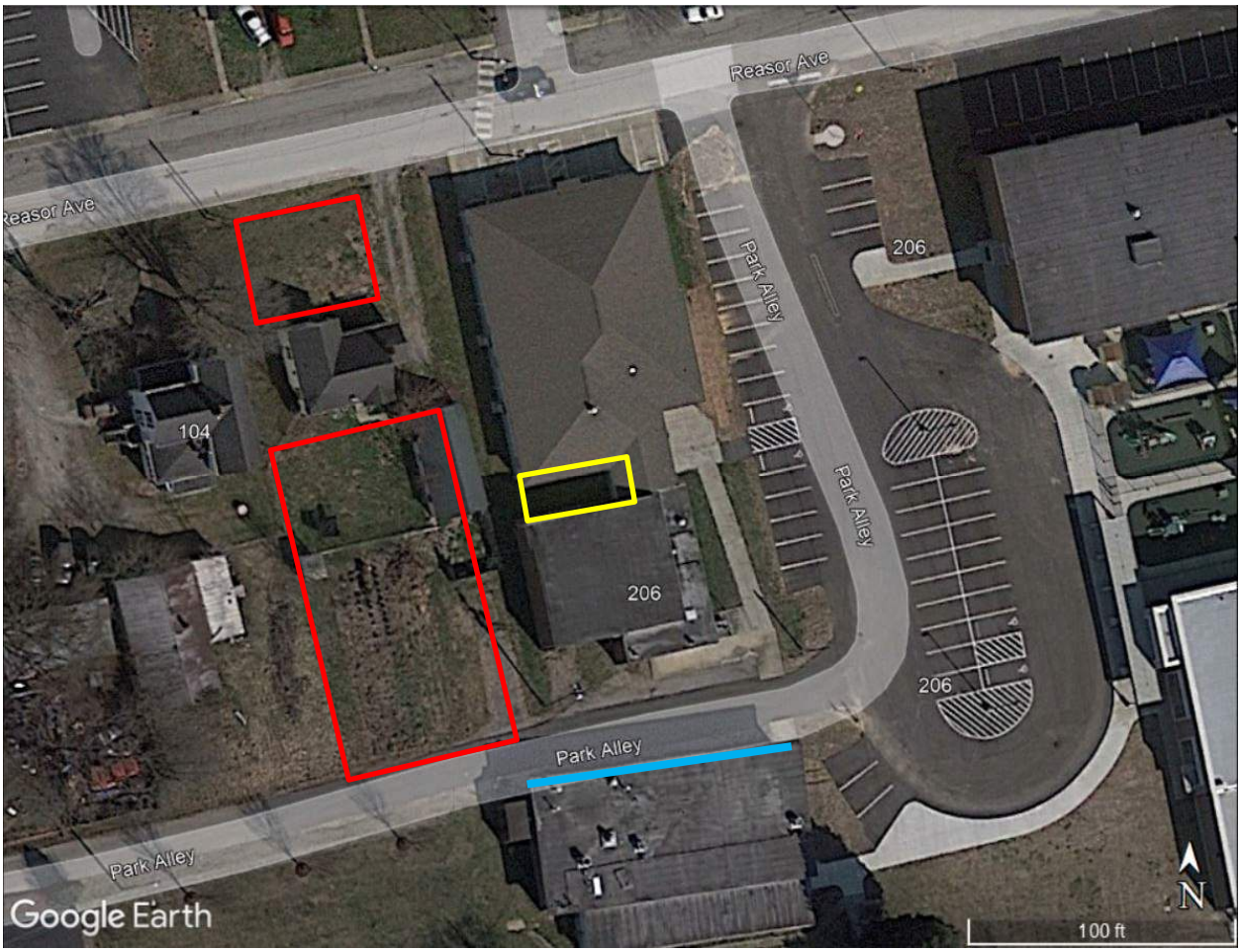


Figure 2: Aerial of proposed parking lots (red), vestibule (yellow) and canopy (blue).

FINDINGS

As part of our geotechnical site characterization, we observed site conditions, reviewed regional geological maps, performed a subsurface exploration, and observed the groundwater conditions. The following sections report our findings.

Site Surface Conditions

Mr. Rob Folsom, PE, with Vector Engineers, observed the surface conditions on November 15, 2024 to aid in interpreting the subsurface data and to detect conditions that could affect the project. The project area is located in an alluvial plain about 700 feet south of Brashears Creek and the overall project area is generally fairly level. Residential developments on the west side of Taylorsville surround the project site. The project area is composed of the west lot, the center lot, and east lot.

Figure 3: The BOE office building on the left is in the center lot and the yellow house in on the west lot. Reasor Avenue bounds the project area to the north.

Figure 4: The project area is generally level, but the terrain to the south rises about 20 to 30 feet. All Saints Catholic Church sits on top of the hill behind the west lot.

West Lot, Future Parking Lot

The west lot will be developed with the two new parking lots. Reasor Avenue formed the northern boundary, further north were houses, and to the far north was a levee berm and Brashears Creek. The west lot is bordered to the west by a two-story, wood-siding house, and to the east by the Board of Education (BOE) office building. The

southern boundary of the lot is formed by a narrow asphalt road named Park Alley. Further south, the All Saints Catholic Church sits on top of a hill approximately 20 feet higher than the west lot. The hill continues to rise to the east of the church to about 30 feet higher than the school site.

The west lot was occupied by a single-story, wood-siding house in the northern third of the lot, and an abandoned garage. The garage was located south of the house along the east side of the lot. The garage was dilapidated and will be razed as part of the project.

The west lot was generally level and drainage was poor. The front yard (north) was about 2 feet higher in elevation suggesting some fill was placed to raise the grade around the front of the house. Surface water drainage in the front yard was good being directed to the north and Reasor Avenue.

Figure 5: The backyard of the west lot is nearly level. The old garage to the right will be razed.

Center Lot, Future Vestibule and Canopy

The center lot is situated between the west lot and the east lot which is the parking lot for Spencer County Early Learning Center (SCELC). Reasor Avenue and the residential development border the center lot to the north.

The center lot is nearly fully developed with the BOE office building. The office building is two interconnected buildings: a north wing and south wing. Between the two wings on the west side of the building, there is a small area (about 12 by 75 feet) covered by lawn. The future vestibule will be in this location.

South of the office building runs Park Alley and south of Park Alley is an old gym that is being renovated. The future canopy will be located along the north side of the old gym and Park Alley. The site was paved with concrete. The pavement was cracked but appeared to be due to age and wear and not likely an indication of subgrade failures.

Drainage in the center lot was judged to be good. Surface water was directed away from the buildings into constructed drain systems.

Figure 6: Park Alley runs between the BOE south wing (left) and the gym building (right). The canopy will be constructed on the gym building.

East Lot, Existing Spencer County Early Learning Center Parking Lot

The east lot was developed as a parking lot for the SCELC. The asphalt pavement was in good to excellent condition. Drainage was provided by storm drains for the parking lot. Mr. Steven Rucker reported that during heavy rain events, water would pool in the northern portion of the SCELC parking lot close to Reasor Avenue. This is due to a larger (12-inch) stormwater drain directing water into a smaller (8-inch) stormwater drain. We understand this deficiency has been fixed.

Figure 7: The east lot was the parking lot of the SCELC school

Historical Aerial Photographs

Based on historical aerial photographs, the BOE and SCELC buildings appear to have been constructed sometime before 1997. However, the SCELC was renovated

sometime around 2020. The SCELC parking lot was also constructed sometime around 2020.

Area Geology

The Geologic Map of the Taylorsville Quadrangle, Kentucky (GQ-1433), published by the U.S. Geological Survey indicates the majority of the site is underlain by alluvial deposits from Brashears Creek. The site is located on the inside bend of Brashears Creek and is likely to have alluvial soil deposits. Alluvial deposits consist of silt, clay, sand, and gravel. The alluvium may have been deposited either by floodplain sediment, or lacustrine (lake). We anticipate the deposit is likely floodplain which is primarily silt and clay; whereas, channel deposits are more granular (sand and gravel).

The southern portion of the site, beneath the Family Empowerment Center is underlain by the Clays Ferry formation. The formation consists of 50 to 75 percent shale, 25 to 50 percent limestone, and less than 5 percent siltstone. The greenish gray, clayey shale is weakly fissile in beds of ½ to 3 feet thick. The dominant limestone is medium gray to olive gray with a reddish tinge, fine to coarse-grained, and contains very abundant whole fossils. Limestone beds are typical 1 to 8 inches thick. The medium gray to olive gray siltstone occurs in thin beds of 1 to 4 inches. The soil overlying the Clays Ferry Formation is typically 3 to 7 feet thick in the valley.

Our borings encountered rock specimens that generally agree with the published geologic information.

The site is rated as non-Karst by the KGS, indicating that the geologic conditions present on site are not typically susceptible to the solutioning activity that causes sinkholes and Karst conditions.

Figure 8: KGS geologic map of Taylorsville, Kentucky. The site is underlain by Alluvium (light yellow shading) and Clays Ferry Formation (orange shading).

Subsurface Exploration

After researching the readily available published geological information, a preliminary subsurface profile is formulated. The soil boring program is a means to substantiate the assumptions made in our preliminary profile and assist us in developing a representative subsurface profile of the site. The subsurface conditions will vary between borings, thereby making the development of a representative and reliable profile dependent upon the number of borings or data points obtained during the field operations. The following discusses our interpretation of the subsurface profile on the site based on the published information and the results of our borings. The

individual Boring Logs attached to this report will have specific details at the location of the boring.

Field Exploration and Laboratory Testing Methods

We drilled five borings to explore the subsurface conditions across the site. Mr. Tennyson Miller, geologist, under the guidance of Mr. Rob Folsom, PE, directed drilling operations. The boring locations were located in the field by measuring distances from landmarks (i.e. – building corners and the edge of pavements) using a measuring wheel or pacing. Boring surface elevations were interpolated from a topographic survey provided to us[2]. Because of the methods used, the soil boring locations shown on the Boring Location Plan and the surface elevations shown on the Boring Logs in the attachments are approximate. The stratification lines shown on the Boring Logs represent the approximate boundaries between soil types. The transitions may be more gradual than shown.

We obtained soil samples using a split-barrel sampler driven by an automatic hammer assembly in general accordance with ASTM D1586. The soil samples were sealed in the field and returned to our laboratory where Mr. Folsom assigned the applicable laboratory tests. The soil samples were visually classified according to the Unified Soil Classification System (USCS, ASTM D2487). We conducted moisture contents on several soil samples. Atterberg limits tests were performed on selected soil samples to determine the engineering properties of the soil. The results of the test will be reported later.

The procedures used by Vector Engineers for field and laboratory sampling and testing are in general accordance with ASTM procedures and established engineering practice. A brief summary of the field and laboratory procedures is included in the attachments.

[2] *Topographic Survey*, Spencer C8unty Board of Education, 520 Taylorsville Road, prepared by Matthew Sibole Surveying, dated November 4, 2024.

Subsurface Conditions - Parking Lots

Beneath about 3 to 5 inches of topsoil, our borings generally encountered low to moderate plasticity clay extended to our boring termination depth of 8 feet. Standard penetration (SPT) N-values within the stratum ranged from 3 to 9 blows per foot (bpf) with a median value of 7 bpf. The penetration values indicated soft to stiff soil consistency. The surface soils (upper 3 feet) were soft to firm; while the deeper soils were firm to stiff. The soils were visually classified soil samples as "CL" (a moderate plasticity clay).

Subsurface Conditions- Building Additions

Subsurface conditions at the structures were explored by two borings extending to refusal. Due to site access, neither of the two borings were located within the footprint of the proposed structures. Boring B-3 was located near the proposed vestibule and Boring B-5 was near the canopy. Both borings encountered about 4 inches of topsoil. Boring B-5 encountered about a foot of stiff, lean clay fill near the surface. The fill contains trace amounts of rock fragments. Our soil samples did not indicate debris or organics within the fill.

The two building borings generally encountered low to moderate plasticity clay to depths of 18 feet in Boring B-3 and a depth of 19½ feet in Boring B-5. SPT N-values within the stratum generally ranged from 7 to 14 bpf with a median value of 12 bpf. The penetration values indicated firm to stiff soil consistency. The surface soils (less than 18 inches deep) at Boring B-3 were soft. Using visual manual methods, the soils were classified as "CL".

Beneath the lean clay, our borings generally encountered weathered gray shale extending to split spoon refusal.[3]

[3] Split spoon refusal is defined when the sampler cannot be driven a full 6-inch interval within 50 blows of the SPT hammer.

Groundwater

A brief review of water monitoring wells in the area indicated high groundwater; however, groundwater was not encountered in any of the borings after soil augering. However, the outside of some split spoons were wet. We believe that the observe water on the spoon was due to either perched or trapped water within the soil. These perched water sources are often not linked to the more continuous relatively stable groundwater table that typically occurs at greater depths.

DISCUSSION

Based on the results of our borings and our understanding of the proposed project, we believe the project site is suitable for the proposed building and new pavements. However, the poor drainage of the west lot suggest some of the surface soil may need to be stabilized. The following subsections provide additional details and discuss other geotechnical concerns.

Soft Soils for Pavement Subgrade

Generally, we anticipate the native soils will be stable if constructed during dry weather; however, we anticipate some areas may not pass a proofroll. These soils will need to be stabilized. The extent of the stabilization area and cost of stabilization will be dependent on the weather and the construction schedule.

When unstable subgrade is encountered, there are several methods available to stabilize the subgrade. Frequently, the construction team must weigh costs with a delay of schedule. If the construction schedule can allow extra time for drying and working the damp soils, then expensive overruns can be avoided.

When unstable subgrade is encountered, Vector Engineers should be contacted to assist the construction team in selecting the best method for the project needs. Some typical subgrade stabilization methods include:

- *Scarifying and Drying*: In this method, the soil subgrade is plowed up, allowed to dry, and then recompacted. Additionally, deep soils may be dried out, by cutting drainage trenches spaced on 30 to 50-foot intervals. There must be a place to dissipate the water.

- *Soil Swap*: Damp soils can be undercut and replaced with other soil from the site (or, if necessary, an off-site borrow source) that is near the optimum moisture content. The damp soils are stockpiled, allow to dry, and then recompacted in the borrow source location.
- *Undercut and Replace with Granular Fill*: Generally, the fastest but most expensive method is to undercut 18 to 36 inches of soil and replace it with approved fill in accordance with the structural fill recommendation in this report. Geotextiles Type 2B (AASHTO M288-96) may need to be placed at the base of the excavation.
- *Chemical Stabilization or Modification:* The addition of cement or lime to the soil will create a hard surface resistant to future surface water softening (waterproof). The process requires specialized equipment and typically a specialty contractor. Once implemented, the subgrade will remain stable and resistant to moisture fluctuations but must be protected from repeated heavy construction traffic.

We anticipate that if sufficient time is allowed during the construction schedule and the weathered is relatively dry, the soft surface soils can be stabilized using *Scarifying and Drying*.

Groundwater During Construction

Based on our groundwater observation during drilling, we do not anticipate groundwater will be encountered during construction. However, high groundwater has been reported at other nearby sites. If groundwater is encountered, we anticipate the water can be drained using sump and pump methods.

Groundwater levels fluctuate with seasonal and cyclical climatic variations in precipitation and may be either higher or lower at other times. Typically, water conditions affecting construction projects in the site area are related to trapped or perched water which occurs in irregular, discontinuous locations within the soil overburden, or near the soil/rock interface. When these water-bearing strata are exposed in excavations, such as cut slopes, utility or footing trenches, they can produce widely varying seepage durations and rates depending on recent rainfall activity and other site specific characteristics of the area.

Moderate Plasticity Clays

High plasticity clay soil (classified as CH according to the USCS) was encountered in our borings. Based on empirical correlations with soil type, these plastic clays found on-site are moderately susceptible to volume change with variations in moisture content. Using prudent construction and site drainage practices, the shrink and swell potential can be controlled and prevent structural damage.

Prolonged exposure to excessive moisture fluctuations (wetting or drying) could cause volume changes to occur within the building or paved areas. The resulting deformations can cause undesirable cracking in the structure or pavements. Building and site drainage should be designed to minimize exposure of these soils to moisture fluctuations, especially near building foundations. *Construction planning should minimize the exposure of these soils to excessive wetting or drying.* These materials are suitable for use as fill provided the soil moisture contents are stringently controlled in the field.

LIMITATIONS OF RECOMMENDATIONS

This report has been prepared for the exclusive use of Spencer County Board of Education for specific application to the project site. Our recommendations have been prepared using generally accepted standards of geotechnical engineering practice in the Commonwealth of Kentucky. No other warranty is expressed or implied. This company is not responsible for the conclusions, opinions, or recommendations of others based on these data. Additionally, our conclusions and recommendations are based on the information provided to us, the data obtained from our subsurface exploration, and our experience. They do not reflect variations in the subsurface conditions which are likely to exist between borings and in unexplored areas of the site. These variations result from the geologic variability of the subsurface conditions. If conditions are different than those encountered in our exploration, it will be necessary for us to re-evaluate our conclusions and recommendations based upon on-site observation of the conditions. For more information on the use and limitations of this report, please read the GBA document included in the attachments.

If the overall design or location of the project is changed, the recommendations contained in this report must not be considered valid unless our firm reviews the changes and our recommendations are modified. When the design is finalized, we should be allowed to provide the additional service of reviewing the grading plan and applicable portions of the project specifications. This review will allow us to check whether these documents are consistent with the intent of our recommendations.

We may recommend that a supplementary exploration be performed when significant design changes such as the movement of the project are incorporated into the final design after the geotechnical exploration has been completed. This supplementary exploration may include obtaining additional soil data along the new alignment to provide specific recommendations.

RECOMMENDATIONS

Earthwork

Since a grading plan was not supplied to us at the time of this report preparation, our preliminary grading estimates suggest less than 2 feet of cut or fill will be required to achieve a final grade.

Stripping

Topsoil, old concrete pavements, and debris should be stripped to prepare the site for construction. The stripping should extend 5 feet outside of the pavement and building areas. Abandoned buried utilities and utility trench backfill should also be removed. Vector's representative should observe site stripping as previously unexplored or unknown conditions could become evident during these operations. Vector should be contacted if unusual or unexpected subsurface conditions (i.e. – such as buried underground structures) are encountered during stripping operations.

Subgrade Evaluation (Proofrolling)

Site evaluation by proofrolling is critical to the long-term performance of the future parking lot. After stripping, the subgrade should be evaluated by a geotechnical

engineer by observing proofrolling. Proofrolling consists of applying repeated passes (2 to 3 passes) on the subgrade with a fully loaded dump truck or similar rubber-tired vehicle. Any materials judged to deflect excessively under the wheel loads should be stabilized. In the previous section entitled *Soft Soils for Pavement Subgrade*, stabilization options are discussed.

Structural Fill Placement

The following section applies to most soil fill placement including clay, silt, fine sand, clayey or silty sand. It is also applicable to densely graded aggregate (DGA) crushed stone. However, it does not apply to an open-graded stone such as No. 57, No. 23, and shot rock fill.

After subgrade evaluation, fill areas may be brought to the planned subgrade elevations with structural fill. Ideally, the structural fill is defined as inorganic natural soil with maximum particle sizes of 3 inches and a maximum dry density of at least 95 pounds per cubic foot (pcf) when tested by the standard Proctor method (ASTM D698). Limit the fill materials to a Plasticity Index less than 35.

Structural fill should be placed in relatively thin (6 to 8-inch) layers and compacted to at least 95 percent of the soil's maximum dry density as determined by the standard Proctor compaction test. Additionally, the moisture content of the fill material should be maintained within 2 to 3 percent of its standard Proctor optimum moisture content depending upon the results of the Proctor tests. We anticipate any new fill will come from an off-site borrow source. The fill source should be tested and approved by a geotechnical engineer before it is allowed to be used as fill.

Field Density Testing

In-place density testing must be performed as a check that the previously recommended compaction criteria (density and moisture) have been achieved. This allows our project engineer to monitor the quality of the fill construction and verify that the design criteria are being achieved in the field. The performance of slabs-on-grade will depend directly on the quality of the fill construction. The testing frequency for density tests performed on a full-time basis can be determined by our personnel based

on the area to be tested, the grading equipment used, and the construction schedule. Tests should be performed at vertical intervals of at least one-foot as the fill is being placed. We recommend that an engineering technician working under the direction of our project geotechnical engineer perform the density tests.

Foundations

We recommend the use of a maximum allowable net soil bearing pressure of 2,500 psf (pounds per square foot) to size footings. The exterior foundations should be designed with a minimum 30-inch embedment to protect against frost heave. We also recommend foundations have a minimum footing width of 24 inches to lessen the risk of differential settlement and to reduce the risk of punching failure. This footing width also allows for entry into the excavation to remove loose debris and for placement of the reinforcing steel. Reinforcing steel should be clean and dry prior to concrete placement.

Floor Slab

We anticipate the existing soil will be supporting the slab-on-grade floor slab. We recommend a k-value (modulus of subgrade reaction) of 75 pounds per cubic inch (pci) be used in determining the slab thickness. The recommended k-value assumes that the subgrade is prepared in accordance with the earthwork recommendation, and that unstable or soft soils have been stabilized as discussed in the section entitled *Soft Soils for Pavement Subgrade.*

We recommend control joints be placed in the slab around columns and along footing supported walls so these elements may move independently. We recommend a 6-inch thick (minimum) layer of compacted, well-graded crushed stone directly beneath the slab to enhance support and provide a working base for the construction of the floor slab. The crushed stone should be moist, but not wet, as the concrete is placed to reduce curling of the slab as the concrete cures.

Between completion of grading and slab construction, floor slab subgrades are often disturbed by weather, footing, and utility line installation, and other construction activities. For this reason, the subgrade should be evaluated by a geotechnical engineer immediately before constructing the slab. During this evaluation, the subgrade should

be proofrolled with relatively heavy rubber-tired equipment. Areas judged by the geotechnical engineer to perform unacceptably under the moving load should be undercut and replaced with dense graded crushed stone compacted to at least 95 percent of its standard Proctor maximum dry density.

Seismic Site Classification

For seismic site classification, the 2018 Kentucky Building Code references the International Building Code (IBC) which then defers to ASCE 7. At the time of this report, ASCE 7-10 was being used by Kentucky structural engineers. Therefore, 2018 Kentucky Building Code was followed in determining the seismic site class.

The seismic design procedures outlined in the NEHRP (National Earthquake Hazard Reduction Program) guidelines mandate structural design loads be based on the seismic accelerations of the site. Based on the results of our exploration and the geology of the area, we assigned a site seismic classification of "C". Using the OSHPD[4] application as recommended by U.S. Geologic Survey (USGS) and the site coordinates, the seismic design values from the 2010 ASCE-7 Standard were determined and are listed in the attachment.

Pavement Recommendations

As previously stated, Vector anticipates the west lot may have area of soft unstable surface soils. Therefore, detailed proofrolling using repeated passes of a heavily loaded dump truck should be used to evaluate the subgrade before stone base placement.

For pavement to perform satisfactorily, the subgrade soils must have sufficient strength and be stable enough to avoid deterioration from construction traffic and support the paving equipment. Also, the completed pavement sections must resist freeze/thaw cycles and wheel loads from traffic. Generally, construction traffic loading is more severe than the traffic after construction. As such, we recommend holding off paving until the building construction has been completed. This will allow for the

[4] California Office of Statewide Health Planning and Development

remediation of any failed areas. The recommended pavement sections given below are based on the assumption that the pavement subgrade soils have been compacted to at least 95 percent of the standard Proctor maximum dry density at moisture contents as recommended previously in this report.

Minimizing infiltration of water into the subgrade and rapid removal of subsurface water is essential for the successful long-term performance of the pavement. Both the subgrade and the pavement surface should have a minimum slope of one-quarter inch per foot to promote surface drainage. Edges of the pavement should be provided a means of water outlet by extending the aggregate base course through to side ditches. Side ditches should be at least 2 feet below the pavement surface.

The materials should conform and be placed and compacted in accordance with the applicable sections of the Kentucky Transportation Cabinet (KYTC) Standard Specifications for Road and Bridge Construction, latest edition.

New Asphalt Pavement

For the proposed light-duty pavements, we have assumed 25,000 ESAL's (equivalent 18-kip single axle load). For Park Alley, we used 40,000 ESAL to support approximately 10 school buses per school day (200 school days per year). We used the American Association of State Highway and Transportation Officials (AASHTO) Guide for Design of Pavement Structures (1993) as a basis for our flexible pavement thickness analysis. The total pavement thickness requirement is a function of the California Bearing Ratio (CBR). A CBR value of 3 was assumed based on empirical correlations to the encountered soil types. Prior to paving, we recommended detailed proofrolling to detect soft or unstable areas that may require stabilization.

The total pavement thickness requirement is obtained from the AASHTO nomograph in terms of a structural number (SN), a weighted sum of the pavement layer thicknesses accounting for their structural and drainage properties. The following parameters were used in our pavement thickness evaluation:

- Initial Serviceability 4.2
- Terminal Serviceability 2.0
- Reliability 85%
- Life 20 years

Table 1: Recommended Pavement Sections

MATERIAL	PARKING LOT THICKNESS (INCHES)	PARK ALLEY THICKNESS (INCHES)	KY TRANSPORTATION CABINET (KYTC) SPECIFICATION
Asphalt Surface Course	1¼	1½	Section 400
Asphalt Base Course	2	2 ½	Section 400
Crushed Stone Base	8	8	Section 300

If the pavement loading or traffic is increased or individual vehicle loads exceed the loading of semi-tractor trailers such as lift trucks or forklift equipment transverse the recommended pavement section, premature failure of the pavement section may occur.

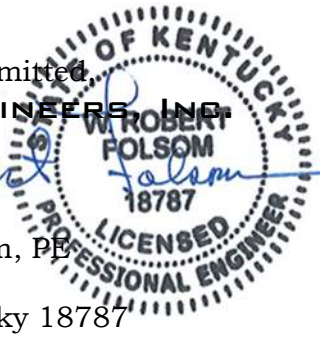
Concrete Pavement

We recommend a dumpster pad be placed on concrete with an apron extending the entire length of the garbage truck beyond the face of the dumpster. The pavement subgrade should consist of a minimum of 12 inches of soil compacted to a minimum of 95 percent of the standard Proctor maximum dry density. We recommend that the concrete pavement be supported by at least a 4-inch layer of dense grade aggregate compacted to a minimum of 95 percent of the standard Proctor maximum dry density. We recommend a minimum concrete section of 5 inches for this site. The concrete should be air-entrained and have a 28-day compressive strength of 4,000 psi.

Valediction

Vector Engineers, Inc. appreciates the opportunity to provide you with these geotechnical services. Should you have questions or require any additional information, please contact us.

Respectfully submitted,
VECTOR ENGINEERS, INC.



W. Robert Folsom, PE
Chief Engineer
Licensed Kentucky 18787

Matthew J. Slusser, PE
Geotechnical Manager

Attachments:

- GBA - Important Information about This Geotechnical-Engineering Report
- Site Location Map
- Boring Location Aerial
- Subsurface Profile
- Test Boring Records
- Field Testing Procedures
- OSHPD Seismic Design Parameters

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be,* and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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SECTION 024100 - DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of built site elements.

C. Selective demolition of building elements for alterations purposes.

D. Abandonment and removal of existing utilities and utility structures.

E. Use precautionary measures to prevent subgrade issues and to avoid creating unsuitable soils as a result of construction activity.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 011000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

C. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 016000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.

1.03 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 EXECUTION

2.01 SCOPE (Some items may not apply, demolish items as required to construct new work and as shown on plans)

A. Remove paving and curbs as required to accomplish new work.

B. Remove all other paving and curbs within site boundaries.

C. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.

D. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.

E. Remove concrete slabs on grade within site boundaries.

F. Break up concrete slabs on grade within site boundaries to permit natural moisture drainage; leave pieces not larger than 1 square yard.

G. Remove underground tanks.

H. Remove underground tanks that contain or once contained petroleum products; fill and bury other types of tanks.

I. Remove manholes and manhole covers, curb inlets and catch basins.

J. Remove fences and gates.

K. Remove storm sewer piping and/or structures.

L. Remove vegetation and root systems.

M. Remove goal posts.

N. Remove scoreboards.

O. Remove flagpoles.

P. Remove irrigation systems.

Q. Remove wooden bridges.

R. Remove bollards.

S. Remove concrete steps and associated footings, guardrails, and handrails.

T. Remove bleachers.

U. Remove signs.

V. Remove parking blocks.

W. Remove other items indicated, for salvage, relocation, and recycling.

X. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

Y. Contractor shall prepare and submit to the Owner a sequencing plan for demolition.

Z. Remove portions of existing building per sequence plan prepared by the Contractor.

AA. All demolition debris shall be hauled off-site and properly disposed of.

2.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   3. Provide, erect, and maintain temporary barriers and security devices.
   4. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   6. Do not close or obstruct roadways or sidewalks without permit.
   7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

D. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

E. Underground Storage Tanks: Remove and dispose of as specified in Section 026500.

2.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

2.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 in locations indicated on drawings.

C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove items indicated on drawings.

D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

2.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.

B. Related Requirements:

1. Section 011000 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

C. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 PREINSTALLATION MEETINGS

A. Pre-demolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control, and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's and other tenants' on-site operations are uninterrupted.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.
5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

1.7 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract. A hazardous materials report / survey is available from the Owner upon request.

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. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction, including local, state, federal and EPA required permits.

B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and preconstruction videotapes.

1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

    a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    b. Equipment to Be Removed: Disconnect and cap services and remove equipment.

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 Section 015000 "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.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
6. Provide dust barriers through openings into occupied portions of building (including MPE penetrations).

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.

1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. 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.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."

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 cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.

B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weather-tight. See Section 075423 "Thermoplastic Polyolefin (TPO) Roofing " for new roofing requirements.

1. Remove existing roof membrane, flashings, copings, and roof accessories.
2. Remove existing roofing system down to wood deck substrate.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in a landfill compliant with local, state and federal authorities.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 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 024119

SECTION 033000 - CONCRETE WORK

PART 1 - GENERAL

1. Related Documents:

    A. Drawings and general provisions of Contract, including General and Supplementary Condition apply to work of this section.

2. Description of Work:

    A. The extent of concrete work shown on drawings.

    B. Concrete paving and walks are specified in Division 2

3. Quality Assurance:

    A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified.

        1. ACI 301 "Specifications for Structural Concrete ".

        2. ACI 318 "Building Code Requirements for Reinforced Concrete".

        3. ACI 117 “Standard Specifications for Tolerances for Concrete Construction and Materials.”

        4. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

    B. Concrete Testing Service: Employ, at Contractor's expense a testing laboratory acceptable to Architect to perform material evaluation tests, field cylinder tests and to design concrete mixes.

    C. Materials and installed work may require testing and retesting, as directed by Architect, at anytime during progress of work. Allow free access to material stockpiles and facilities. Tests, not specifically indicated to be done at Owner's expense, including retesting of rejected materials and installed work, shall be done at Contractor's expense.

4. Submittals:

    A. Product Data: Submit manufacturer’s product data with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by Architect.

    B. Shop Drawings; Reinforcement: Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required and openings through concrete structures.

    C. Samples: Submit samples of materials as specified and as otherwise requested by Architect, including names, sources and descriptions.

    D. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design test as specified.

    E. Material Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

PART 2 - PRODUCTS

1. Form Materials:

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

        1. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled an edge-sealed, with each piece bearing legible inspection trademark.

    B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. All lumber used must be dressed on at least 2 edges and one side to insure a tight fit.

    C. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will impair subsequent treatments of concrete surfaces.

2. Reinforcing Materials:

    A. Reinforcing Bars (Rebar): ANSI/ASTM A 615, Grade 60, deformed.

    B. Steel Wire: ANSI/ASTM A 82, plain, cold-drawn, steel.

    C. Welded Wire Fabric (WWF): ASTM A 185, welded steel wire fabric (flat sheets).

    D. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI recommendations, unless otherwise acceptable.

    E. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

3. Concrete Materials:

    A. Portland Cement: ANSI/ASTM C 150, Type I, unless otherwise acceptable to Architect.

    B. Use one brand of cement throughout project, unless otherwise acceptable to Architect.

    C. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates form a single source for exposed concrete.

    D. Water: Potable.

    E. Air-Entraining Admixture: ASTM C 260.

    F. Calcium chloride not permitted.

    G. Mid-Range Water-Reducing Admixture: ASTM C494 Type A

4. Related Materials:

A. Moisture Barrier: Provide moisture barrier cover over prepared base material for all slabs on grade. Use only materials with a permeance rating of less than 0.1 Perms when tested in accordance with ASTM E154, as follows:

1. Refer to Specification Section 07 26 00 -UNDER-SLAB VAPOR RETARDER

B. Chemical Hardener: Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent, containing not less than 2 lbs. of fluosilicates per gal.

C. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

D. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper.

2. Polyethylene film.

3. Polyethylene-coated burlap.

E. Liquid Membrane-Forming Curing Compound: ASTM C 1315, Type 1, Class A.

1. Provide a curing compound compatible with floor sealers and floor finishes in areas to receive sealer and finishes. See Division 9 and room finish schedule for type of floor sealer and finishes.

F. Expansion Joint Material:

1. Type F by Sonneborn for exterior slab conditions.
2. Self-adhesive “VYCORE” by W.R. Grace(or approved equal) for all interior slab locations.

5. Proportioning and Design of Mixes:

A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.

B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.

C. Design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules.

1. 3500 psi 28-day compressive strength; 520 lbs. cement per cu. yd. minimum; W/C ratio, 0.45 max for interior slabs and 0.46 max for all other concrete. Flyash substitution is only permitted in the slabs with a 15% maximum content. Flyash substitution is <u>not permitted in the foundations</u>.
2. Lean Concrete Fill under foundations (where required): 1500 psi 28-day compressive strength.

D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and

accepted by Architect before using in work.

E. Admixtures:

1. Use air-entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content within following limits:

a. Concrete structures and slabs exposed to freezing and thawing or subjected to hydraulic pressure:

3% to 5% for maximum 1" aggregate.

b. Other Concrete:

2% to 4% air.

F. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows(these values can be exceeded by use of water-reducer, but ranges required before addition of water-reducer):

1. Ramps and sloping surfaces: Not more than 3".

2. Reinforced foundation systems: Not less than 1" and not more than 5".

3. Other concrete: Not less than 1" and not more than 5".

6. Concrete Mixes:

A. Job-Site Mixing: Mix materials for concrete in appropriate drum type batch machine mixer. For mixers of one cu. yd., or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released. For mixers of capacity larger than one cu. yd., increase minimum 1-1/2 minutes of mixing time by 15 seconds for each additional cu. yd., or fraction thereof.

B. Provide batch ticket for each batch discharges and used in work, indicating project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.

C. Ready Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.

1. Delete references for allowing additional water to be added to batch for material with insufficient slump. Addition of water to the batch will not be permitted.

D. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

1. When air temperature is between 85 degrees (F) and 90 degrees (F), reduce mixing and delivery time for 1-1/2 hours to 75 minutes, and when air temperature is above 90 degrees (F), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

1. Forms:

   A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.

   B. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

   C. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.

   D. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.

   E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

   F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

   G. Form Ties: Factory-fabricated, adjustable-length, removable or snapoff metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.

      1. Unless otherwise indicated, provide ties so portion remaining within concrete after removal is at least 1-1/2" inside concrete.

      2. Unless otherwise shown, provide form ties which will not leave holes larger than 1" diameter in concrete surface.

   H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.

   I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

2. Placing Reinforcement:

   A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.

   B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.

C. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.

D. Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3. Joints:

A. Construction Joints: Locate and install construction joints, which are not shown on drawings, so as not to impair strength and appearance of the structure, as acceptable to Architect.

B. Provide keyways at least 1-1/2" deep in construction joints in walls, slabs and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.

C. Place construction joints perpendicular to the main reinforcement. Continue reinforcement across construction joints.

D. Control Joints: Saw cut joints as shown on the drawings. Joints to be sawn as soon as concrete is set sufficiently, but must be sawn the same day as the concrete is poured.

4. Installation of Embedded Items:

A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.

B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

5. Preparation of Form Surfaces:

A. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

B. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturers instructions.

C. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

6. Concrete Placement:

A. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work.

Moisten wood forms immediately before placing concrete form coatings are not used.

B. Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.

C. General: Comply with ACI 304, and as herein specified. Deposit concrete continuously or in layers of such thickness that no concrete will placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

E. Consolidate placed concrete by mechanical vibrating equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.

F. Do not use vibrators to transport concrete inside form. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

G. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

H. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

I. Bring slab surfaces to correct level with straightedge and strikeoff. All interior slabs shall pitch to floor drains (if drains are indicated on Architectural or Mechanical or Structural Drawings). All exterior slabs shall drain away from the building and shall not pond any water. Do not set screeds off metal deck setting on steel beams. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

J. Maintain reinforcing in proper position during concrete placement operations.

K. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.

L. When air temperature has fallen to or is expected to fall below 40 degrees (F), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees (F), and not more than 80 degrees (F) at point of placement.

M. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

N. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs. Non-chloride accelerators may be used if submitted and approved in the design mix.

O. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

P. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees (F). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing.

Q. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

R. Wet forms thoroughly before placing concrete.

S. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or their adverse placing conditions.

7. Finish of Formed Surfaces:

A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chopped off.

B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

C. Smooth Rubbed Finish: Provide smooth rubbed finish to exposed concrete surfaces, which have received smooth form finish treatment, not later than one day after form removal.

D. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

E. Related Uniformed Surfaces: At tops of walls, horizontal offsets surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

F. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, paint or other thin film finish coating system. After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand troweling operation, free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8" in 10' when tested with a 10' straightedge. Grind smooth surface defects which would telegraph through applied floor covering system. If interior floor slab is “burnt / shiny”, the slab shall be sanded, abraded, and in severe cases might require beed blast

G. Chemical-Hardener Finish: Apply chemical-hardener finish to interior concrete floors where indicated by the Architect on the Room Finish Schedule. Apply liquid chemical-hardener after complete curing and drying of the concrete surface. Dilute liquid hardener with water, and apply in 3 coats; first coat, 1/3-strength; second coat, 1/2-strength; third coat, 2/3-strength. Evenly apply each coat, and allow 24 hours for drying between coats.

1. Apply proprietary chemical hardeners, in accordance with manufacturer's printed instructions.

2. After final coat of chemical-hardener solution is applied and dried, remove surplus hardener by scrubbing and mopping with water.

8. Concrete Curing and Protection:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

C. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

D. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover curing, by curing compound (only with specific approval for interior slabs), and by combinations thereof, as herein specified.

E. Provide moisture curing by following methods.

1. Keep concrete surface continuously wet by covering water.

2. Continuous water-fog spray.

3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

F. Provide moisture-cover curing as follows: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

G. Provide curing compound to slabs as follows (only permitted by special approval):

1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuously operation by powerspray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during period.

2. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials, unless otherwise acceptable to Architect. Coordinate with specified finishes and verify before application.

H. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period of until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

I. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing compound.

J. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

K. All control and expansion joints shall be cleaned and filled with a self-leveling sealant that complies to ASTM C-920 and applied according to the manufacturers recommendations. The sealant shall be one of the following or an approved equal:
    1) Sika - Sikaflex - 2c SL
    2) Sonneborn - Sonolastic SL 1

9. Removal of Forms:

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

B. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days and until concrete has attained design minimum compressive strength at 28 days. Determine potential compressive strength of in place concrete by testing field-cured specimens representative of concrete location or members.

C. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

10. Re-use of Forms:

A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

11. Inspection:

Concrete shall not be placed over pipes, conduits, etc. until such work has been tested, inspected and approved. No concrete shall be deposited until the Architect has inspected the forms and placing of steel reinforcement and given permission to place concrete.

12. Notifying Other Trades:

This Contractor shall notify the Mechanical and Electrical Contractors, and all other Contractors, at the proper time to install all conduits, pipes, pipe sleeves, anchors, or other equipment coming under their respective contracts in the form work.

13. Miscellaneous Concrete Items:

A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

14. Concrete Surface Repairs:

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.

B. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

C. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

D. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

E. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

F. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.

G. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets, and other objectionable conditions.

H. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.

I. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.

J. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all round. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

K. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in area continuously moist for not less than 72 hours.

L. Use epoxy-based mortar for structural repairs, where directed by Architect.

M. Repair methods not specified above may be used, subject to acceptance of Architect.

15. Quality Control Testing During Construction:

A. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

1. Slump: ASTM C 143; one test for each concrete load at point of discharge; and one test for each set of compressive strength test specimens.

2. Air content: ASTM C 173; volumetric method for light-weight or normal weight concrete; ASTM C 231 pressure for normal weight concrete; one for each set of compressive strength test specimens.

3. Concrete Temperature: Test hourly when air temperature is 40 degrees (F) and below, and when 80 degrees (F) and above; and each time a set of compression test specimens made.

4. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.

5. Compressive Strength Tests: ASTM C 39; one set for each 100 cu. yds. or fraction thereof, of each concrete class placed in any one day or for each 5000 sq. ft. of surface area placed; 1 specimen tested at 7 days, 2 specimen tested at 28 days, and one specimen retained in reserve for later testing if required.

6. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.

7. When total quantity of a given class of concrete is less than 50 cu. yds., strength test may be waived by Architect if, in his judgement, adequate evidence of satisfactory strength is provided.

8. When strength of field-cured cylinders is less than 85 % of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

9. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive by more than 500 psi.

B. Test results will be reported in writing to Architect, Structural Engineer, Owner, and Contractor on same day that tests are made. Reports of compressive strength test shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.

C. Additional Tests: The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such test required, when unacceptable concrete is verified.

END OF SECTION 033000

SECTION 048100 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Concrete unit masonry.
2. Split face masonry.
3. Reinforced unit masonry.
4. Insulation in masonry walls.
5. Masonry waste disposal.
6. Masonry cleaner.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 7 Section "Sheet Metal Flashing and Trim" for exposed sheet-metal flashing installed in masonry.
2. Division 7 Section "Sheet Metal Flashing and Trim" for gutter and downspout for mockup.
3. Division 7 Section "Joint Sealants" for sealing joint in mockup.

C. Products furnished but not installed under this Section include the following:

1. Anchor sections of adjustable masonry anchors for connecting to structural frame installed under Division 5 Section "Structural Steel."

D. Products installed but not furnished under this Section include the following:

1. Steel lintels for unit masonry specified in Division 5 Section "Metal Fabrications."
2. Steel shelf angles for unit masonry specified in Division 5 Section "Metal Fabrications."
3. Wood nailers and blocking built into unit masonry specified in Division 6 Section "Rough Carpentry."
4. Manufactured reglets in masonry joints for metal flashing specified in Division 7 Section "Sheet Metal Flashing and Trim."
5. Hollow metal frames in unit masonry openings specified in Division 8 Section "Standard Steel Doors and Frames."

1.3 PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops the following installed compressive strengths (f'm) at 28 days.

1. For Concrete Unit Masonry: As follows, based on net area:

a. f'm = 1900 psi (14.6 MPa).

2. For Brick Unit Masonry: As follows, based on gross area:

a. f'm = 3000 psi (20.6 MPa).

3. For Grout:

a. f'c = 2500 psi (12.7 MPa).

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each masonry unit, accessory, and other manufactured product specified.

C. Shop drawings for reinforcing detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcement" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.

D. Samples for initial selection of the following:

1. Unit masonry samples in small-scale form showing the full range of colors and textures available for each different exposed masonry unit required.

E. Samples for verification of the following:

1. Full-size units for each different exposed masonry unit required showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.

a. Include size-variation data for Type FBX and Type FBS brick, verifying that actual range of sizes for brick falls within ASTM C 216 dimension tolerances.

2. Weep holes/vents in color to match mortar color.
3. Accessories embedded in the masonry.

F. Material certificates for the following, signed by manufacturer and Contractor, certifying that each material complies with requirements.

1. Each different cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
2. Each material and grade indicated for reinforcing bars.
3. Each type and size of joint reinforcement.
4. Each type and size of anchors, ties, and metal accessories.

G. Current material test reports from a qualified independent testing agency, employed and paid by Contractor or manufacturer, indicating and interpreting test results relative to compliance of the following proposed masonry materials with requirements indicated:

1. Mortar complying with property requirements of ASTM C 270.
2. Grout mixes. Include description of type and proportions of grout ingredients.
3. Masonry units.
4. Include historical field compressive strength results for mortar and grout mixes.

H. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

I. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.

J. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform

quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

K. Mockup: Prior to installing unit masonry, construct sample wall panels to verify selections made under sample submittals and to demonstrate aesthetic effects as well as other qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.

1. Locate mockups on site in the locations as directed by Architect.

2. Build mockups for middle school and sports practice building for the following types of masonry in sizes approximately 60 inches (1200 mm) long by 60 inches (1200 mm) high by full thickness, including face and back-up wythes as well as accessories. Include a sealant-filled joint at least 16 inches (400 mm) long in each mockup.

    a. Each type of exposed unit masonry construction.

3. Clean exposed faces of mockups with masonry cleaner indicated.
4. Where masonry is to match existing, erect panels adjacent and parallel to existing surface.
5. Notify Architect one week in advance of the dates and times when mockups will be constructed.
6. Protect accepted mockups from the elements with weather-resistant membrane.
7. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

    a. Acceptance of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
    b. Acceptance of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.
    c. When directed, demolish and remove mockups from Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not install until they are in an air-dried condition.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely

in place.

2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
2. Protect sills, ledges, and projections from mortar droppings.
3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements:

1. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:

   a. 40 to 32 deg F (4 to 0 deg C): Heat mixing water or sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C).
   b. 32 to 25 deg F (0 to -4 deg C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperatures between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing until used in masonry.
   c. 25 to 20 deg F (-4 to -7 deg C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperatures between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg F (4 deg C) if grouting. Use heat on both sides of walls under construction.
   d. 20 deg F (-7 deg C) and Below: Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperatures between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg F (4 deg C). Provide enclosures and use heat on both sides of walls under construction to maintain temperatures above 32 deg F (0 deg C) within the enclosures.

2. Cold-Weather Protection: When the mean daily temperature is within the limits indicated, provide the following protection:

   a. 40 to 25 deg F (4 to -4 deg C): Cover masonry with a weather-resistant membrane for 48 hours after construction.
   b. 25 to 20 deg F (-4 to -7 deg C): Cover masonry with insulating blankets or provide enclosure and heat for 48 hours after construction to prevent freezing. Install wind breaks when wind velocity exceeds 15 mi./h (25 km/h).
   c. 20 deg F (-7 deg C) and Below: Provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for 48 hours after construction.

3. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried out, but not less than 7 days after completion of cleaning.

E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F (38 deg C) and above.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Concrete Masonry Units: Light weight, Type II non-moisture-controlled.

2. Split-faced Masonry Units: Standard weight, moisture controlled. Dimension cleft face and texture to match existing.

3. Portland Cement, Mortar Cement, Masonry Cement, and Lime: (Match existing at elementary and middle schools)

a. Essroc Materials, Inc.
b. Glen-Gery Corporation
c. Lafarge Corporation
d. Lehigh Portland Cement Co.
e. Riverton Corporation (The)
f. Kosmos
g. Richmortar

4. Joint Reinforcement, Ties, and Anchors:

a. AA Wire Products Co.
b. Dur-O-Wal, Inc.
c. Heckman Building Products, Inc.
d. Hohmann & Barnard, Inc.
e. Masonry Reinforcing Corp. of America.
f. National Wire Products Industries.
g. Southern Construction Products.

2.2 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows for each form of concrete masonry unit required.

1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
2. Provide bullnose units for outside corners, unless otherwise indicated.
3. Groundface masonry units are to use pre-manufactured corner units at all outside corners. Miter cuts are not acceptable

B. Concrete Masonry Units: ASTM C 90 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength indicated below:

a. 1900 psi (14.6 MPa).
b. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.

2. Weight Classification: Lightweight.
3. Aggregates: Do not use aggregates made from pumice, scoria, or tuff.
4. Provide Type II non-moisture-controlled units.
5. Size: Manufactured to the actual dimensions listed below (within tolerances specified in the applicable referenced ASTM specification) for the corresponding nominal sizes indicated on Drawings:

a. 4 inch (100 mm) nominal: 3-5/8 inch (92 mm) actual.
b. 6 inch (150 mm) nominal: 5-5/8 inch (143 mm) actual.
c. 8 inch (200 mm) nominal: 7-5/8 inch (194 mm) actual.
d. 10 inch (250 mm) nominal: 9-5/8 inch (244 mm) actual.
e. 12 inch (300 mm) nominal: 11-5/8 inch (295 mm) actual.
f. 16 inch (400 mm) nominal: 15-5/8 inch (397 mm) actual.

6. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

C. Split-face Concrete Masonry Units: ASTM C 90 and as follows:

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength indicated below:

a. 1900 psi (14.6 MPa).
b. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.

2. Weight Classification: standard.
3. Provide moisture controlled units.
4. Size: Manufactured to dimensions indicated for nondecorative units.
5. Finish: Exposed faces of the following general description matching color, pattern of existing

a. Manufacturer’s standard aggregate, ground finish.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm), use aggregate graded with 100 percent passing the No. 16 (1.18 mm) sieve.

D. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C 494, Type C, and recommended by the manufacturer for use in masonry mortar of composition indicated.

E. Water: Potable.

F. Products: Subject to compliance with requirements, provide one of the following:

1.a Cold-Weather Admixture:

b. Accelguard 80; Euclid Chemical Co.
c. Morset; Grace: W.R. Grace & Co.

2.4 REINFORCING STEEL

A. Steel Reinforcing Bars: Material and grade as follows:

1. Billet steel complying with ASTM A 615 (ASTM A 615M).

a. Grade 60 (Grade 400).

B. Deformed Reinforcing Wire: ASTM A 496, with ASTM A 153, Class B-2 zinc coating.

2.5 JOINT REINFORCEMENT

A. General: Provide joint reinforcement formed from the following:

1. Galvanized carbon-steel wire, coating class as follows:

a. ASTM A 641 (ASTM A 641M), Class 1, for interior walls; and ASTM A 153, Class B-2, for exterior walls.

B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet (3 m), with prefabricated corner and tee units, and complying with requirements indicated below:

1. Wire Diameter for Side Rods: 0.1483 inch (9 gage)(3.8 mm).
2. Wire Diameter for Cross Rods: 0.1483 inch (9 gage)(3.8 mm).

C. For single-wythe masonry, provide type as follows with single pair of side rods:

1. Provide 0.1875 inch, 3/16 inch wire diameter for side and cross rods at all masonry where stack bond is indicated or required.
2. Truss design with continuous diagonal cross rods spaced not more than 16 inches (407 mm) o.c.

D. For multiwythe masonry, provide type as follows:

1. Truss design with continuous diagonal cross rods spaced not more than 16 inches (407 mm) o.c.

a. Number of Side Rods for Multiwythe Concrete Masonry: One side rod for each face shell of hollow masonry units more than 4 inches (100 mm) in width, plus 1 side rod for each wythe of masonry 4 inches (100 mm) or less in width.
b. Provide integral drips on cross rods at cavity walls.

2. Tab design with single pair of side rods and rectangular box-type cross ties spaced not more than 16 inches (407 mm) o.c., with side rods spaced for embedment within each face shell of back-up wythe and ties extended to engage the outer wythe by at least 1-1/2 inches (38 mm).
3. Adjustable (2-piece) tab design with single pair of side rods and rectangular box-type cross ties spaced not more than 16 inches (407 mm) o.c., with side rods spaced for embedment within each face shell of back-up wythe and with separate adjustable ties engaging the cross ties and extended to engage the outer wythe by at least 1-1/2 inches (38 mm) and spaced not more than 16 inches (407 mm) o.c.

a. Use where horizontal joints of facing wythe do not align with those of back-up and where indicated.

2.6 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of this Article, unless otherwise indicated.

B. Wire: As follows:

1. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
2. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating for wire ties and anchors in exterior walls.
3. Wire Diameter: 0.1875 inch (4.8 mm).

C. Steel Sheet: As follows:

1. Galvanized Steel Sheet: ASTM A 526, G 60 (ASTM A 526M, Z 180) (commercial quality), steel sheet zinc coated by hot-dip process on continuous lines prior to fabrication, for sheet-metal ties and anchors in interior walls and in exterior walls when completely embedded in mortar.
2. Galvanized Steel Sheet: ASTM A 366 (ASTM A 366M) (commercial quality) cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153, Class B-2 or B-3, as applicable, for sheet-metal ties and anchors in exterior walls not completely embedded in mortar and grout.
3. Galvanized Steel Sheet: ASTM A 366 (ASTM A 366M) (commercial quality) cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153, Class B-2 or B-3, as applicable, for sheet-metal ties and anchors.

D. Galvanized Steel Sheet Thickness: For steel sheet hot-dip galvanized by continuous process prior to fabrication:

1. 0.1084 inch (12 gage) (2.8 mm).

E. Thickness of Steel Sheet Galvanized After Fabrication: Uncoated thickness of steel sheet for hot-dip galvanizing after fabrication:

1. 0.1046 inch (12 gage) (2.7 mm).

F. Galvanized Heavy-Thickness Steel Sheet: ASTM A 635 (ASTM A 635M) (commercial quality) hot-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153, Class B-2 or B-3, as applicable, for rigid anchors fabricated from steel sheet or strip with a thickness of 0.180 inch (4.6 mm) and greater.

G. Steel Plates and Bars: ASTM A 36 (ASTM A 36M), hot-dip galvanized to comply with ASTM A 153, Class B-1, B-2, or B-3, as applicable to size and form indicated.

2.7 BENT WIRE TIES

A. Individual units prefabricated from bent wire to comply with requirements indicated below:

1. Tie Shape for Hollow Masonry Units Laid with Cells Vertical: Rectangular with closed ends and not less than 4 inches (100 mm) wide.
2. Type for Masonry Where Coursing Between Wythes Aligns: Unit ties bent from one piece of wire.
3. Type for Masonry Where Coursing Between Wythes Does Not Align: Adjustable ties composed of 2 parts; one with pintles, the other with eyes; maximum misalignment of 1-1/4 inches (32 mm).

4. Type for Masonry Where Wythes Are of Different Materials: Adjustable ties composed of 2 parts; one with pintles, the other with eyes; maximum misalignment of 1-1/4 inches (32 mm).

2.8 ADJUSTABLE ANCHORS FOR CONNECTING TO STRUCTURAL FRAME

A. General: Provide 2-piece assemblies as described below, allowing vertical or horizontal differential movement between wall and frame parallel to plane of wall but resisting tension and compression forces perpendicular to it.

1. For anchorage to concrete, provide manufacturer's standard anchors with dovetail anchor section formed from sheet metal and triangular-shaped wire tie section sized to extend within 1 inch (25 mm) of masonry face and as follows:

a. Wire Diameter: 0.1875 inch (4.8 mm).

2. For anchorage to steel framing, provide manufacturer's standard anchors with crimped 1/4-inch- (6.4-mm-) diameter wire anchor section for welding to steel and triangular-shaped wire tie section sized to extend within 1 inch (25 mm) of masonry face and as follows:

a. Wire Diameter: 0.1875 inch (4.8 mm).

2.9 RIGID ANCHORS

A. General: Fabricate from steel bars as follows:

1. 1-1/2 inches (38 mm) wide by 1/4 inch (6.4 mm) thick by 24 inches (600 mm) long, with ends turned up 2 inches (50 mm) or with cross pins.

2.30 ADJUSTABLE MASONRY-VENEER ANCHORS

A. General: Provide 2-piece assemblies allowing vertical or horizontal differential movement between wall and wall framing parallel to plane of wall but resisting tension and compression forces perpendicular to it, for attachment over sheathing to metal studs, and with the following structural performance characteristics:

1. Structural Performance Characteristics: Capable of withstanding a 100-lbf (445-N) load in either tension or compression without deforming over, or developing play in excess of, 0.05 inch (1.3 mm).

B. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie section and a metal anchor section complying with the following requirements:

1. Wire Tie Shape: Triangular.
2. Wire Tie Length: As required to extend 1-1/2 inches (38 mm) into masonry wythe of veneer face.
3. Anchor Section: Sheet-metal plate with screw holes top and bottom and with raised, rib-stiffened strap stamped into center to provide a slot between strap and plate for connection of wire tie; of overall size indicated below:

a. Plate and Strap Size: 1-1/4 inches (32 mm) wide for plate, 5/8 inch (16 mm) wide for strap by lengths indicated below; slot clearance formed between face of plate and back of strap at maximum rib projection: 1/32 inch (0.8 mm) plus diameter of wire tie.

1. Plate and Strap Lengths: 9 inches (225 mm) and 5-1/2 inches (140 mm).

C. Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 (4.8-mm) diameter by length required to penetrate steel stud flange by not less than 3 exposed threads, and with the following corrosion protective coating:

D. Products: Subject to compliance with requirements, provide one of the following:

1. Screw-Attached, Masonry-Veneer Anchors:

a. D/A 213; Dur-O-Wal, Inc.
b. Pos-I-Tie; Heckman Building Products, Inc.
c. DW-10; Hohmann & Barnard, Inc.
d. DW-10HS; Hohmann & Barnard, Inc.
e. DW-10-X; Hohmann & Barnard, Inc.

2. Slip-in, Masonry-Veneer Anchors:

a. AA308; AA Wire Products Co.

2.11 MISCELLANEOUS ANCHORS

A. Unit Type Inserts in Concrete are included in Division 3 Concrete section.

B. Dovetail slots are included in Division 3 Concrete section.

C. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:

1. Headed bolts.
2. Nonheaded bolts, straight.
3. Nonheaded bolts, bent in manner indicated.

2.12 EMBEDDED FLASHING MATERIALS

A. Laminated Flashing: Manufacturer's standard laminated flashing of type indicated below:

B. Asphalt-Coated Copper Flashing: Manufacturer's standard product consisting of sheet copper of weight indicated below, coated with flexible asphalt.

1. Weight: 3 oz./sq. ft. (0.9 kg/sq. m).
2. Application: Use where flashing is fully concealed in masonry.

C. Adhesive for Flashings: Of type recommended by manufacturer of flashing material for use indicated.

D. Products: Subject to compliance with requirements, provide one of the following:

1. Asphalt-Coated Copper Flashing:

a. Cop-A-Cote; AFCO Products, Inc.
b. Type ACC-Asphalt Bituminous Coated; Phoenix Building Products.
c. Coated Copper Flashing; Sandell Manufacturing Co., Inc.
d. Copperseal; York Manufacturing, Inc.

2.13 MISCELLANEOUS MASONRY ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35 percent; of width and thickness indicated; formulated from the following material:

1. Urethane.

B. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

1. Polyvinyl Chloride: ASTM D 2287, General Purpose Grade, Type PVC-65406.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Weep Holes: Provide the following:

1. Rectangular Plastic Tubing: Clear butyrate, 3/8 by 1-1/2 by 3-1/2 inches (9 by 38 by 89 mm).
2. Wicking Material: Material as indicated below, in length required to produce 2-inch (50-mm) exposure on exterior and 18 inches (450 mm) in cavity between wythes:

a. Cotton sash cord.

3. Plastic Weep Hole/Vent: One-piece, flexible extrusion manufactured from ultraviolet-resistant polypropylene copolymer, designed to weep moisture in masonry cavity to exterior, sized to fill head joints with outside face held back 1/8 inch (3 mm) from exterior face of masonry, in color selected from manufacturer's standard.
4. Products: Subject to compliance with requirements, provide one of the following weep hole/ventilators:

a. Plastic Weep Hole/Vent:

1. Cell Vent; Dur-O-Wal, Inc.

2.14 INSULATION

A. Extruded Polystyrene Board Insulation: Rigid, cellular, polystyrene thermal insulation with closed cells and integral high-density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578, Type IV; in manufacturer's standard lengths and widths; and in thicknesses indicated.

B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.15 MASONRY CLEANERS

1. Products: Subject to compliance with requirements, provide:

a. As recommended by masonry unit manufacturers.

2.16 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.
2. Add cold-weather admixture (if used) at the same rate for all mortar, regardless of weather conditions, in order to ensure that mortar color is consistent.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar indicated below:

1. Limit cementitious materials in mortar to portland cement and lime.
2. For masonry below grade, in contact with earth, and where indicated, use type indicated below:

   a. Type: M.

3. For all load-bearing and non-load-bearing concrete reinforced masonry, use type indicated below:

   a. Type: S.

4. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions, and for other applications where another type is not indicated, use type indicated below:

   a. Type: S.

C. Grout for Unit Masonry: Comply with ASTM C 476. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement that will completely fill spaces intended to receive grout.

1. Use fine grout in grout spaces less than 2 inches (50 mm) in horizontal dimension, unless otherwise indicated.
2. Use coarse grout in grout spaces 2 inches (50 mm) or more in least horizontal dimension, unless otherwise indicated.

2.17 MASONRY CLEANER

A. Product Description: Concentrated acidic cleaning compound for the removal of heavy atmospheric staining from unpolished masonry.

1. Masonry Cleaner as Follows:

   FORM: Clear liquid

   SPECIFIC GRAVITY: 1.132
   pH: 2.2 (@ 1:3 Dilution)

2. Application: Per manufacturer's printed instructions Product Data Sheet for Restoration Cleaner.

   a. Prewet the surface with clean water.

   b. Apply the cleaner using a brush or low-pressure spray.

   c. Let the cleaning solution stay on the surface per manufacturer's guidelines. Reapply. Gently scrub heavily soiled areas.

   d. Rinse with low-pressure flood rinse to remove initial acidic residue with minimum risk of wind drift.

   e. Rinse thoroughly using high-pressure spray, from the bottom of the treated area to the top covering each section of the surface with a concentrated stream of water. The best combination of rinsing pressure and water volume is provided by masonry washing equipment generating 400-1000 psi with a water flow rate of 6-

8 gallons per minute delivered through a 15-45 degree fan spray tip. Equipment should be adjustable to reduce water flow rate and rinsing pressure as required for controlled cleaning of more sensitive surfaces. See also “Equipment” section of the Product Data Sheet.

3. Test Area

Test a minimum 4 ft. by 4 ft. area on each type of masonry. Use manufacturer’s application instructions. Let the test panel dry 3 to 7 days before inspection. Keep test panels available for comparison throughout the cleaning project.

4. Manufacturer:

a. PROSOCO, Inc., 3741 Greenway Circle, Lawrence, KS 66046. Phone: (800) 255-4255; Fax: (785) 830-9797. E-mail: CustomerCare@prosoco.com

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of unit masonry. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of thickness indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections of the Specifications.

C. Leave openings for equipment to be installed before completion of masonry. After installing equipment, complete masonry to match construction immediately adjacent to the opening.

D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting, where possible. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.

F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.

G. Wetting of Brick: Wet brick prior to laying if the initial rate of absorption exceeds 30 g/30 sq. in. (g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb the water so they are damp but not wet at the time of laying.

3.3 CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces of columns, walls, and arrises, do not exceed 1/4 inch in 10 feet (6 mm in 3 m), nor 3/8 inch in 20 feet (10 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For vertical alignment of head joints, do not exceed plus or minus 1/4 inch in 10 feet (6 mm in 3 m), nor 1/2 inch (12 mm) maximum.

B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For top surface of bearing walls, do not exceed 1/8 inch (3 mm) in 10 feet (3 m), nor 1/16 inch (1.5 mm) within width of a single unit.

C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partitions, do not exceed 1/2 inch in 20 feet (12 mm in 6 m), nor 3/4 inch in 40 feet (19 mm in 12 m) or more.

D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch (6 mm) nor plus 1/2 inch (12 mm).

E. Variation in Mortar-Joint Thickness: Do not vary from bed-joint thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm). Do not vary bed-joint thickness from bed-joint thickness of adjacent course by more than 1/8 inch (3 mm). Do not vary from head-joint thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary head-joint thickness from adjacent head-joint thickness by more than 1/8 inch (3 mm). Do not vary from collar-joint thickness indicated by more than minus 1/4 inch (6 mm) or plus 3/8 inch (10 mm).

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.

B. Lay walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.

C. Bond Pattern for Exposed Masonry: Lay exposed masonry in running bond pattern; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

E. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar prior to laying fresh masonry.

F. Built-in Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

G. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

1. At exterior frames, insert extruded polystyrene board insulation around perimeter of frame in thickness indicated, but not less than 3/4 inch (19 mm) to act as a thermal break between frame and masonry.

H. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

I. 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.

J. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above and as follows:

1. Install compressible filler in joint between top of partition and underside of structure above.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
4. Maintain joint widths indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 3/8-inch (10-mm) joints.

B. Lay solid brick-size masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not furrow bed joints or slush head joints.

1. At cavity walls, slope beds toward cavity to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against cavity face of brick.

C. Lay hollow brick as follows:

1. Lay vertical-cell units with full head joints, unless otherwise indicated. Provide bed joints with full mortar coverage on face shells and webs.
2. Lay horizontal-cell units with full bed joints, unless otherwise indicated. Keep drainage channels, if any, free of mortar. Form head joints with sufficient mortar so excess will be squeezed out as units are placed in position. Butter both sides of units to be placed, or butter one side of unit in place and one side of unit to be placed.
3. Maintain joint widths indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 1/4- to 3/8-inch (6- to 10-mm) joints.

D. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

1. For glazed masonry units, use a nonmetallic jointer 3/4 inch (19 mm) or more in width.

E. Cut joints flush for masonry walls that are to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.6 STRUCTURAL BONDING OF MULTIWYTHE MASONRY

A. Use continuous horizontal-joint reinforcement installed in horizontal mortar joints for bond tie between wythes.

B. Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.

1. Provide continuity with horizontal-joint reinforcement at corners by using prefabricated "L" units in addition to masonry bonding.

C. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space as follows:

1. Provide individual metal ties not more than 16 inches (406 mm) o.c.
2. Provide continuity with horizontal-joint reinforcement by using prefabricated "T" units.

3. 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.

3.7 CAVITIES

A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.

1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

B. Tie exterior wythe to back-up with continuous horizontal-joint reinforcing.

3.8 CAVITY-WALL AND MASONRY-CELL INSULATION

A. On units of plastic board insulation, place small dabs of adhesive, spaced approximately 12 inches (300 mm) o.c., both ways on inside face or attach to inside face with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

B. Pour granular insulation into cavities as shown to fill void spaces completely. Maintain inspection ports to show presence of insulation at extremities of each pour area. Close ports after complete coverage has been confirmed. Limit fall of insulation to 1 story in height, but not to exceed 20 feet (6 m).

3.9 HORIZONTAL-JOINT REINFORCEMENT

A. General: Provide continuous horizontal-joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcing a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.
2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.

b. Reinforcement above is in addition to continuous reinforcement.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.10 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch (25 mm) in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.

3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.11 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to metal studs with masonry-veneer anchors to comply with the following requirements:

1. Fasten each anchor section through sheathing to metal studs with 2 metal fasteners of type indicated.
2. Fasten anchors through sheathing to metal studs with metal fasteners of type indicated.
3. Insert anchor section in metal studs as sheathing is installed. Provide one anchor at each stud in each horizontal joint between sheathing boards.
4. Embed tie section in masonry joints. Provide not less than 2-inch (50-mm) air space between back of masonry veneer and face of sheathing.
5. Locate anchor section relative to course where tie section is embedded to allow maximum vertical differential movement of tie up and down.
6. Space anchors as indicated, but not more than 18 inches (458 mm) o.c. vertically and 24 inches (610 mm) o.c. horizontally with not less than 1 anchor for every 2 sq. ft. (0.2 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals around perimeter not exceeding 8 inches (203 mm).

3.12 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry where indicated. Build-in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry as follows:

1. Install preformed control-joint gaskets designed to fit standard sash block.

C. Form expansion joints in brick made from clay or shale as follows:

1. Build-in joint fillers where indicated.
2. Form open joint of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Division 7 Section "Joint Sealants." Maintain joint free and clear of mortar.

D. Build-in horizontal pressure-relieving joints where indicated or required; construct joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 7 Section "Joint Sealants."

1. Locate horizontal pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

3.13 LINTELS

A. Install steel lintels where indicated or required.

B. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick size units and 24 inches (610 mm) for block size units are shown without structural steel or other supporting lintels.

1. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout. Cure

   precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

C. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated or required.

3.14 FLASHING, WEEP HOLES, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in the wall, and where indicated.

B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer before covering with mortar.

C. Install flashing as follows:

1. At composite masonry walls, including cavity walls, extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4 inches (100 mm), and through the inner wythe to within 1/2 inch (13 mm) of the interior face of the wall in exposed masonry. Where interior surface of inner wythe is concealed by furring, carry flashing completely through the inner wythe and turn up approximately 2 inches (50 mm), unless otherwise indicated.
2. At masonry-veneer walls, extend flashing from exterior face of veneer, through the veneer, up face of sheathing at least 8 inches (200 mm), and behind air-infiltration barrier/building paper.
3. At lintels and shelf angles, extend flashing a minimum of 4 inches (100 mm) into masonry at each end. At heads and sills, extend flashing 4 inches (100 mm) at ends and turn up not less than 2 inches (50 mm) to form a pan.
4. Cut off flashing flush with face of wall after masonry wall construction is completed.

D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:

1. Form weep holes with product specified in Part 2 of this Section.
2. Space weep holes 48 inches (1200 mm) o.c. and alternate locations with wall vents.
3. In cavities, place mortar net to a height equal to height of first course, but not less than 2 inches (50 mm), immediately above top of flashing embedded in the wall, as masonry construction progresses, to splatter mortar droppings and to maintain drainage.

E. Trim wicking material used in weep holes flush with outside face of wall after mortar has set.

F. Install vents in vertical head joints at the top of each continuous cavity. Space vents at 48 inches o.c. and alternate locations with weep holes and close off cavities vertically and horizontally with blocking in manner indicated.

1. Install through-wall flashing and weep holes above horizontal blocking.

G. Install reglets and nailers for flashing and other related construction where shown to be built into masonry.

3.15 INSTALLATION OF REINFORCED UNIT MASONRY

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

1. Do not exceed the following pour heights for fine grout:

b. For minimum widths of grout spaces of 3/4 inch (19 mm) or for minimum grout space of hollow unit cells of 1-1/2 by 2 inches (38 by 51 mm), pour height of 12 inches (305 mm).
c. For minimum widths of grout spaces of 2 inches (51 mm) or for minimum grout space of hollow unit cells of 2 by 3 inches (51 by 76 mm), pour height of 60 inches (1524 mm).
d. For minimum widths of grout spaces of 2-1/2 inches (63 mm) or for minimum grout space of hollow unit cells of 2-1/2 by 3 inches (63 by 76 mm), pour height of 12 feet (3.6 m).
e. For minimum widths of grout spaces of 3 inches (76 mm) or for minimum grout space of hollow unit cells of 3 by 3 inches (76 by 76 mm), pour height of 24 feet (7.3 m).

2. Do not exceed the following pour heights for coarse grout:

a. For minimum widths of grout spaces of 1-1/2 inches (38 mm) or for minimum grout space of hollow unit cells of 1-1/2 by 3 inches (38 by 76 mm), pour height of 12 inches (305 mm).
b. For minimum widths of grout spaces of 2 inches (51 mm) or for minimum grout space of hollow unit cells of 2-1/2 by 3 inches (63 by 76 mm), pour height of 60 inches (1524 mm).
c. For minimum widths of grout spaces of 2-1/2 inches (63 mm) or for minimum grout space of hollow unit cells of 3 by 3 inches (76 by 76 mm), pour height of 12 feet (3.6 m).
d. For minimum widths of grout spaces of 3 inches (76 mm) or for minimum grout space of hollow unit cells of 3 by 4 inches (76 by 101 mm), pour height of 24 feet (7.3 m).

3. Provide cleanout holes at least 3 inches (76 mm) in least dimension for grout pours over 60 inches (1524 mm) in height.

a. Provide cleanout holes at each vertical reinforcing bar.
b. At solid grouted masonry, provide cleanout holes at not more than 32 inches (813 mm) o.c.

3.16 FIELD QUALITY CONTROL

A. Testing Frequency: Tests and Evaluations listed in this Article will be performed by Owner

during construction for each 5000 sq. ft. (460 sq. m) of wall area or portion thereof. Minimum test during masonry work every 5 days or as directed by Architect.

B. Mortar properties will be tested per property specification of ASTM C 270.

C. Mortar composition and properties will be evaluated per ASTM C 780.

D. Grout will be sampled and tested for compressive strength per ASTM C 1019.

E. Prism-Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM E 447, Method B, and as follows:

1. Prepare 1 set of prisms for testing at 7 days and 1 set for testing at 28 days.

F. Evaluation of Quality-Control Tests: In the absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality-control tests comply with minimum requirements indicated.

3.17 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears prior to tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry.

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
5. Clean brick by bucket and brush hand-cleaning method described in BIA Technical Note No. 20 Revised, using a job-mixed detergent solution.
6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain present on exposed surfaces.
7. Clean limestone units to comply with recommendations in the "Indiana Limestone Handbook" of the Indiana Limestone Institute of America.

E. Protection: Provide final protection and maintain conditions that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

3.18 MASONRY WASTE DISPOSAL

A. Recycling: Undamaged, excess masonry materials are Contractor's property and shall be removed from the Project site for his use.

B. Disposal as Fill Material: Dispose of clean masonry waste, including broken masonry units,

waste mortar, and excess or soil-contaminated sand, by crushing and mixing with fill material as fill is placed.

1. Crush masonry waste to less than 4 inches (100 mm) in greatest dimension.
2. Mix masonry waste with at least 2 parts specified fill material for each part masonry waste. Fill material is specified in Division 2 Section "Earthwork."
3. Do not dispose of masonry waste as fill within 18 inches (450 mm) of finished grade.

C. Excess Masonry Waste: Remove excess, clean masonry waste that cannot be used as fill, as described above, and other masonry waste and legally dispose of off Owner's property.

END OF SECTION 048100

SECTION 051200 - STRUCTURAL STEEL

1. GENERAL:

   A. The general provisions of the Contract, including General and supplementary Conditions and General Requirements, apply to the work specified in this section.

2. RELATED WORK SPECIFIED ELSEWHERE:

   A. Grouting under base and bearing plates, Division 3.

3. FURNISHED BUT INSTALLED ELSEWHERE:

   A. Anchor bolts, loose bearing plates, which will be installed under Division 3.

4. REQUIREMENTS FOR REGULATORY AGENCIES:

   A. AISC Specification Structural Steel for Building shall mean AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, adopted July 7, 2016.

   B. Specification for Structural joints shall mean "Specifications for Structural Joints Using ASTM A 325 or A 490 Bolts, approved by the Research Council on Riveted and Bolted Joints of the Engineered Foundation, August 1, 2014.

   C. AWS Building Code shall mean AWS "Code for Welding in Building Construction", DI.1-2007.

5. QUALIFICATIONS:

   A. **The supplier shall be the steel fabricator and the steel fabricator shall be AISC CATEGORY I plant certified, OR AWS SHOP CERTIFIED, OR** Employ an independent special inspection agency to verify the fabrication of all structural members. The cost of this shall be the sole responsibility of the Steel Fabricator. This inspection agency shall have AWS D1.1 qualifications, and be approved by the Engineer and Owner. The special inspection agency must submit reports of acceptance for all shop fabricated items as required in KBC-2018, sections 1704.2.5 and 1705.2. Any material sent to the site without a report of acceptance from the fabricator's special inspector will be inspected by the owner's special inspector. The cost of these additional tests will be deducted from the contractor's application for payment. If the lack of inspections from the fabricator persists, then owner's special inspector will be sent to the fabricator's shop daily to inspect all of the material for this project and the costs for these inspections will be deducted from the contractor's application for payment (NO EXCEPTIONS).

   B. Welding procedures, welders, welding operations and tackers shall be qualified in accordance with AWS Building Code.

6. SUBMITTALS:

   A. Shop Drawings:

      1. Submit shop drawings indicating all shop and erection details, including cuts, copes, connection, holes, threaded fasteners and welds.

      2. All welds, both shop and field shall be indicated by AWS "Welding Symbols" A2.0-68.

   B. Erection Procedure: Submit descriptive data to illustrate the structural steel erection procedure, including the sequence of erection and temporary staying and bracing.

   C. Welding Procedure: Submit written description as required to illustrate each welding procedure to be performed in the specified work.

D. Field Welding Equipment: Submit descriptive data for field welding equipment, including type, voltage and amperage.

E. Reports of mechanical tests for high strength threaded fasteners.

7. PRODUCT HANDLING:

A. Delivery of materials to be installed under other sections:

1. Anchor bolts and other anchorage devices which are embedded in cast-in-place concrete or masonry construction shall be delivered to the project site in time to ~~b~~ installed before the start of cast-in-place concrete operations or masonry work.

2. Provide setting drawings, templates, and directions for the installation of the anchor bolts and other devices.

B. Storage of Materials:

1. Structural steel members which are stored at the project site shall be above ground on platforms, skids or other supports.

2. Steel shall be protected from corrosion.

3. Other materials shall be stored in a weathertight and dry place, until ready for use in the work.

4. Packaged materials shall be stored in their original unbroken package or container.

8. MATERIALS:

A. Steel Shapes, Bars, and Plates:

1. ASTM A992 (all W-shapes)

2. ASTM A 36.(all bars, plates, channels)

3. ASTM A 500, Grade B (Tube Columns).

4. ASTM A 53, Grade B (Pipe Columns).

B. Structural steel, fabrication and erection shall comply with the American Institute of Steel Construction, Specifications for the Design, Fabrication and Erection of Structural Steel for Building.

C. Anchor Bolts: Conform to Section 1C of ASTM A 307-68.

D. High-Strength Threaded Fasteners: ASTM A 325, **Torque Control** (Tension Set) bolts.

E. Filler Metals for Welding:

1. Shielded metal-arc welding: AWS A5.1, E70 Electrodes.

2. Submerged arc welding: AWS A5.17.

F. Shop Paint Primer:

1. Standard Primer: SSPC Paint System Guide No. 7.00.

G. All bolted connections shall be of high strength bolts conforming to ASTM A 325 and shall

be bearing type with threads excluded from shear plane.

H. All structural steel shall be accurately set and properly secured in place. Field connections of steel work shall be welded or bolted with high strength bolts, size as called for on the drawings. Connections shall be as detailed. All welding to be done by certified welders with at least five years experience in structural welding, and in a neat workmanlike manner.

9. FABRICATION:

A. Fabricate Structural Steel in accordance with the AISC Specification with the modifications and additional requirements specified in this section:

1. Shop and field welding shall conform to AWS and AISC Standards and Specifications.

2. Flame cutting of steel will not be permitted.

B. Shop connections shall be welded.

C. Field Connections:

1. Provide bolted, except where welded connections are indicated.

2. High strength threaded fasteners shall be used for bolted connections, except where standard threaded fasteners are permitted.

D. High-Strength Bolted Construction Assembly:

1. Tightening shall be done in accordance with Section 5 of AISC-Specifications for Structural Joints. All bolts shall have 28,000 pounds of tension (330 ft*lbs torque) applied.

E. Welded Construction:

1. Welding process shall be limited to one or a combination of the following:

a. Manual shielded-arc

b. Submerged arc.

c. Studs to be welded with automatically timed welding equipment.

F. Column Bases shall be milled and attached to columns.

G. Shop Painting:

1. Shop paint all steelwork. All steel on site must be primed.

2. Steelwork to be painted shall receive a one-coat shop paint system in accordance with SSPC Paint System PS 7.01 Paint 14-64T.

3. Steel components are not to be labeled with permanent markings. All markings on the steel shall be primed and painted to match adjacent steel.

10. ERECTION:

A. Erect structural steel in accordance with the AISC Specifications with modifications and additional requirements of this section:

B. Column Bases and Bearing Plates:

1. Attached column bases and bearing plates for beams and similar structural members

shall be aligned with wedges or shims.

2. Loose column bases and bearing plates which are too heavy to be placed without a derrick or crane shall be set and wedged or shimmed.

C. Erection Tolerances:

1. Individual pieces shall be erected so that the deviation from plumb, level and alignment shall not exceed 1 to 500.

D. Field Assembly:

1. Structural steel frames shall be accurately assembled to the lines and elevations indicated, within the specified erection tolerances.

2. The various members forming parts of a complete frame or structure after being assembled shall be aligned and adjusted accurately before being fastened.

3. Fastening of splices of compression members shall be done after the abutting surfaces have been brought completely into contact.

4. Bearing surfaces and surfaces which will be in permanent contact shall be cleaned before the members are assembled.

5. Splices shall be permitted only where indicated.

6. Field connections, field welds, and shear connectors shall be as specified in "Fabrication".

7. Erection bolts used in welded construction shall be tightened and left in place.

E. Gas Cutting: Field correcting of fabrication by gas cutting shall not be permitted on any major member in the structural framing without prior approval of the Architect.

11. TOUCH-UP PAINTING:

A. Immediately after erection, clean field welds, bolted connections, and abraded areas of the shop paint, and paint all exposed areas with the same material as used for shop painting. Apply brush or spray to provide a minimum dry film thickness of 2.0 mils.

END OF SECTION 051200

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Exterior & Interior non-load-bearing wall framing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of cold-formed steel framing product and accessory.

B. Shop Drawings:

   1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
   2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
   3. Shop drawings shall bear the designer’s engineering seal from a professional engineer registered in the Commonwealth of Kentucky, show all design and fabrication data, permanent bracing requirements, and handling and erection instructions.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Product test reports.

D. Research reports.

1.4 QUALITY ASSURANCE

A. Product Tests: Mill certificates or data from a qualified independent testing agency.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Dietrich Metal Framing; a Worthington Industries company.
   2. Formetal Co. Inc. (The).
   3. MBA Building Supplies, Inc.
   4. Nuconsteel; a Nucor Company.
   5. SCAFCO Corporation.
   6. Southeastern Stud & Components, Inc.
   7. State Building Products, Inc.
   8. Steel Construction Systems.
   9. United Metal Products, Inc.
   10. United Steel Manufacturing.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency.

   1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.3 COLD-FORMED STEEL FRAMING, GENERAL

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

   1. Grade: As required by structural performance.
   2. Coating: G60.

2.4 EXTERIOR NON-LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

   1. Minimum Base-Metal Thickness: 0.0329 inch.
   2. Flange Width: 1-5/8 inches.
   3. Section Properties: minimum size per structural drawings.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and matching minimum base-metal thickness of steel studs.

C. Vertical Deflection Clips: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. AllSteel & Gypsum Products, Inc.
b. ClarkWestern Building Systems, Inc.
c. Dietrich Metal Framing; a Worthington Industries company.
d. MarinoWARE.
e. SCAFCO Corporation.
f. Steel Network, Inc. (The).
g. Steeler, Inc.

D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure.

E. Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure through positive mechanical attachment to stud web and structure.

2.5 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration.

2.6 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts, and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.

D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated

according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.

E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping, steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

2.7 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A 780.

B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, with fluid consistency and 30-minute working time.

D. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.

E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install load bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than 1/4 inch to ensure a uniform bearing surface on supporting concrete or masonry construction.

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

3.2 INSTALLATION, GENERAL

A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.

C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.

D. Install framing members in one-piece lengths.

E. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.

G. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

H. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

I. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.3 EXTERIOR & INTERIOR NON-LOAD-BEARING WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:

1. Stud Spacing: 16 inches.

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single deep-leg deflection tracks and anchor to building structure.
2. Install double deep-leg deflection tracks and anchor outer track to building structure.
3. Connect vertical deflection clips to infill studs and anchor to building structure.
4. Connect drift clips to cold-formed metal framing and anchor to building structure.

E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than 48 inches apart. Fasten at each stud intersection.

1. Top Bridging for Single Deflection Track: Install row of horizontal bridging within 12 inches of single deflection track. Install a combination of bridging and stud or stud-track solid blocking of width and thickness matching studs, secured to stud webs or flanges.

    a. Install solid blocking at centers indicated on Shop Drawings.

2. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.4 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. Testing agency will report test results promptly and in writing to Contractor and Architect.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.5 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Miscellaneous steel trim including steel edgings.
2. Loose bearing and leveling plates for applications where they are not specified in other Sections.

B. Products furnished, but not installed, under this Section include the following:

1. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

C. Related Requirements:

1. Section 03300 "Concrete Work" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
2. Section 04200 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
3. Section 05120 "Structural Steel Framing."

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. 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.

1.4 ACTION SUBMITTALS

A. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:

1. Steel framing and supports for countertops.

2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
3. Steel and Aluminum Ladders
4. Industrial Stairs
5. Miscellaneous steel trim including steel edgings.
6. Metal bollards.
7. Metal downspout boots.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design ladders. Shop drawing Submittal to include the Professional Engineer Stamp, licensed in the State of Kentucky.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.

D. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.

E. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.

F. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.

G. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.

H. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

I. Aluminum Plate and Sheet: ASTM B 209 (ASTM B 209M), Alloy 6061-T6.

J. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.

K. Bronze Castings: ASTM B 584, Alloy UNS No. C83600 (leaded red brass) or No. C84400 (leaded semired brass).

2.3 MISCELLANEOUS MATERIALS

A. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting."

B. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

2.4 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Fabricate units from slotted channel framing where indicated.
2. Furnish inserts for units installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated.

D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.6 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Galvanize exterior miscellaneous steel trim.

2.7 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates.

2.8 STEEL WELD PLATES AND ANGLES

A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.9 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.10 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
3. Other Items: SSPC-SP 3, "Power Tool Cleaning."

D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.11 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, Class I, AA-M12C22A41.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

B. Support steel girders on solid grouted masonry, concrete, or steel pipe columns. Secure girders with anchor bolts embedded in grouted masonry or concrete or with bolts through top plates of pipe columns.

1. Where grout space under bearing plates is indicated for girders supported on concrete or masonry, install as specified in "Installing Bearing and Leveling Plates" Article.

C. Install pipe columns on concrete footings with grouted baseplates. Position and grout column baseplates as specified in "Installing Bearing and Leveling Plates" Article.

1. Grout baseplates of columns supporting steel girders after girders are installed and leveled.

3.3 INSTALLING METAL BOLLARDS

A. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.

1. Do not fill removable bollards with concrete.

B. Anchor bollards in concrete in formed or core-drilled holes not less than 8 inches (200 mm) deep and 3/4 inch (19 mm) larger than OD of bollard. Fill annular space around bollard solidly with nonshrink grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch (3 mm) toward bollard.

C. Fill bollards solidly with concrete, mounding top surface to shed water.

1. Do not fill removable bollards with concrete.

3.4 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with nonshrink grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.5 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting."

END OF SECTION 055000

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Rooftop equipment bases and support curbs.
3. Wood blocking and nailers.
4. Plywood backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

1.3 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

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. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Provide dressed lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness or less, 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

C. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all rough carpentry indicated to be on Drawings, and if any of the following conditions occur:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction,

and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.

C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

E. Application: Treat all rough carpentry items indicated on Drawings, and the following:

1. Framing for raised platforms.
2. Concealed blocking.
3. Framing for non-load-bearing partitions.
4. Roof construction.
5. Plywood backing panels.

2.4 DIMENSION LUMBER FRAMING

A. Framing Other Than Non-Load-Bearing Interior Partitions: No. 2 grade.

1. Application: Framing other than interior partitions not indicated as load-bearing.
2. Species:

a. Hem-fir (north); NLGA.
b. Southern pine; SPIB.
c. Douglas fir-larch; WCLIB or WWPA.
d. Mixed southern pine; SPIB.
e. Spruce-pine-fir; NLGA.
f. Douglas fir-south; WWPA.
g. Hem-fir; WCLIB or WWPA.
h. Douglas fir-larch (north); NLGA.
i. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

2.5 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. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.

B. For items of dimension lumber size, provide No. 2 grade lumber of any species.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine; No. 2 grade; SPIB.
2. Eastern softwoods; No. 2 Common grade; NeLMA.
3. Northern species; No. 2 Common grade; NLGA.
4. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.

2.6 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.

B. Power-Driven Fasteners: NES NER-272.

C. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

2.8 METAL FRAMING ANCHORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cleveland Steel Specialty Co.
2. KC Metals Products, Inc.

3. Phoenix Metal Products, Inc.
4. Simpson Strong-Tie Co., Inc.
5. USP Structural Connectors.

B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

1. Use for interior locations unless otherwise indicated.

D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.

1. Use for wood-preservative-treated lumber and where indicated.

2.9 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch nominal thickness, compressible to 1/32 inch; selected from manufacturer's standard widths to suit width of sill members indicated.

B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.

D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

E. Do not splice structural members between supports unless otherwise indicated.

F. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

G. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

H. Securely attach rough carpentry work to substrate by anchoring and 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.
3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

3.2 PROTECTION

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

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS

A. Emissions: Products shall meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.

C. Oriented Strand Board: DOC PS 2.

2.2 WALL SHEATHING

A. APA Rated Wall Sheathing: As noted on drawings.

2.3 ROOF SHEATHING

A. APA Rated Roof Sheathing: As noted on drawings.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. 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."
3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's "International Residential Code for One- and Two-Family Dwellings."

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Wall and Roof Sheathing:

a. Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
b. Space panels 1/8 inch apart at edges and ends.

END OF SECTION 061600

SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood roof trusses.

1.2 ALLOWANCES

A. Provide wood truss bracing under the Metal-Plate-Connected Truss Bracing Allowance as specified in Section 012100 "Allowances."

1.3 ACTION SUBMITTALS

A. Product Data: For metal-plate connectors, metal truss accessories, and fasteners.

B. Shop Drawings: Show fabrication and installation details for trusses.

1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
2. Indicate sizes, stress grades, and species of lumber.
3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
4. Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members due to design loads.
5. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
6. Show splice details and bearing details.

C. Delegated-Design Submittal: For metal-plate-connected wood trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss-fabricating firm.

B. Evaluation Reports: For the following, from ICC-ES:

1. Metal-plate connectors.
2. Metal truss accessories.

1.5 QUALITY ASSURANCE

A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.

1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Handle and store trusses to comply with recommendations in SBCA BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal-plate-connected wood trusses.

B. Structural Performance: Metal-plate-connected wood trusses shall be capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1.

C. Comply with applicable requirements and recommendations of TPI 1, TPI DSB, and SBCA BCSI.

D. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

2.2 DIMENSION LUMBER

A. Lumber: DOC PS 20 and applicable rules of any rules-writing agency certified by the American Lumber Standard Committee (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. Provide dry lumber with 19 percent maximum moisture content at time of dressing.

B. Permanent Bracing: Provide wood bracing is required to brace trusses to resist all design loads.

2.3 METAL CONNECTOR PLATES

A. Fabricate connector plates to comply with TPI 1.

B. Hot-Dip Galvanized-Steel Sheet: ASTM A653/A653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.

2.4 FASTENERS

A. Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
2. Where trusses are exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

B. Nails, Brads, and Staples: ASTM F1667.

2.5 METAL FRAMING ANCHORS AND ACCESSORIES

A. Allowable design loads, as published by manufacturer, shall comply with or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 coating designation.

2.6 FABRICATION

A. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly, with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.

1. Fabricate wood trusses within manufacturing tolerances in TPI 1.

B. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install wood trusses only after supporting construction is in place and is braced and secured.

B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.

C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.

D. Install and brace trusses according to TPI recommendations and as indicated.

E. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.

F. Securely connect each truss ply required for forming built-up girder trusses.

G. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.

H. Install wood trusses within installation tolerances in TPI 1.

I. Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.

J. Replace wood trusses that are damaged or do not comply with requirements.

END OF SECTION 061753

SECTION 071113 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Cold-applied, emulsified-asphalt dampproofing.

B. Related Requirements:

1. Section 042000 "Unit Masonry" for mortar parge coat on masonry surfaces.

1.3 FIELD CONDITIONS

A. Weather Limitations: Proceed with application only when existing and forecasted weather conditions permit dampproofing to be performed according to manufacturers' written instructions.

B. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has cured.

PART 2 - PRODUCTS

2.1 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

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. ChemMasters, Inc.
2. Degussa Building Systems; Sonneborn Brand Products
3. Tremco Company
4. Meadows, W. R., Inc.
5. Tamms Industries, Inc.

B. Trowel Coats: ASTM D 1227, Type II, Class 1.

C. Fibered Brush and Spray Coats: ASTM D 1227, Type II, Class 1.

D. Brush and Spray Coats: ASTM D 1227, Type III, Class 1.

2.2 AUXILIARY MATERIALS

A. General: Furnish auxiliary materials recommended in writing by dampproofing manufacturer for intended use and compatible with bituminous dampproofing.

B. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended in writing by manufacturer.

C. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.

D. Patching Compound: Asbestos-free fibered mastic of type recommended in writing by dampproofing manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions with Applicator present, for compliance with requirements for surface smoothness, surface moisture, and other conditions affecting performance of bituminous dampproofing work.

B. Proceed with application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.

B. Clean substrates of projections and substances detrimental to the dampproofing work; fill voids, seal joints, and remove bond breakers if any, as recommended in writing by prime material manufacturer.

C. Apply patching compound to patch and fill tie holes, honeycombs, reveals, and other imperfections; cover with asphalt-coated glass fabric.

3.3 APPLICATION, GENERAL

A. Comply with manufacturer's written instructions for dampproofing application, cure time between coats, and drying time before backfilling unless more stringent requirements are indicated.

1. Apply dampproofing to provide continuous plane of protection.
2. Apply additional coats if recommended in writing by manufacturer or to achieve a smooth surface and uninterrupted coverage.

B. Where dampproofing footings and foundation walls, apply from finished-grade line to top of footing; extend over top of footing and down a minimum of 6 inches (150 mm) over outside face of footing.

1. Extend dampproofing 12 inches (300 mm) onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.

C. Where dampproofing exterior face of inner wythe of exterior masonry cavity walls, lap dampproofing at least 1/4 inch (6 mm) onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.

1. Extend dampproofing over outer face of structural members and concrete slabs that interrupt inner wythe.
2. Lap dampproofing at least 1/4 inch (6 mm) onto shelf angles supporting veneer.

D. Where dampproofing interior face of above-grade, exterior concrete and masonry walls, continue dampproofing through intersecting walls by keeping vertical mortar joints at intersection temporarily open or by dampproofing wall before constructing intersecting walls.

3.4 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Masonry Backup for Brick Veneer Assemblies and Stone Veneer Assemblies: Apply primer and one brush or spray coat at not less than 1 gal./100 sq. ft. (0.4 L/sq. m).

3.5 CLEANING

A. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 071113

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Rigid polyisocyanurate board insulation.
2. Thermal batt insulation.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

1.5 QUALITY ASSURANCE

A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect foam-plastic board insulation as follows:

1. Do not expose to sunlight except to necessary extent for period of installation and concealment.

2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 RIGID POLYISOCYANURATE BOARD INSULATION

A. Rigid Polyisocyanurate Board Insulation: Foil-faced with R=7 per inch thickness. Adhere to existing substrates, tape all joints and install per manufacturer's printed instructions.

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. Johns Manville AP Foil-Faced Foam Continuous Insulation (Basis-of-Design)
b. Kingspan Insulation.
c. Owens Corning.

2. Type VI, 40 psi (276 kPa).

B. Adhesive for Bonding Insulation: Product approved by manufacturer with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

2.2 MINERAL-WOOL BLANKET INSULATION

A. Un-faced, Mineral-Wool 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, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 PROTECTION

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

END OF SECTION 072100

SECTION 074113 - MANUFACTURED ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Architectural standing-seam roof panels and accessories and trim as required to complete metal roofing enclosure.
2. Snow rails.

B. Related Sections include the following:
1. Division 6 Section "Miscellaneous Rough Carpentry" for wood framing and sheathing.
2. Division 7 Section "Sheet Metal Flashing and Trim" for flashing not part of roofing and other sheet metal work.
3. Division 7 Section "Joint Sealants" for field-applied sealants.

1.3 PERFORMANCE REQUIREMENTS

A. Performance Requirements: Provide complete engineered system complying with specified requirements and capable of remaining watertight / weathertight while withstanding anticipated movement of substrate and thermally induced movement of roofing system.

B. Overall: Complete weathertight system tested and approved in accordance with ASTM E 1592.

C. Static Air Infiltration: Completed roof system shall have a maximum of 0.06 CFM/sq. ft with 6.24 psf air pressure differential as per ASTM E 283.

D. Water Infiltration: No evidence of water penetration at an inward static air pressure differential of not less than 6.24 psf and not more than 12.00 psf as per ASTM E 331.

1. Test-Pressure Difference: 5 Gallons/Hour per Square Foot and static pressure of between 6.24 PSF and 20 PSF for 15 minutes.

E. Wind-Uplift Resistance: Provide roof panel assemblies that meet requirements of UL 580 for Classification I-90 wind-uplift resistance.

F. Shall resist Hail Damage. “Hail Damage” is defined as; penetration through the surface by a hailstone 1-1/2 inches or less in diameter, or crack in or around the point of impact of a hailstone 1-1/2 inches.

1.4 SUBMITTALS

A. The Architect shall not review individual submittal items within this specification or any related specifications separately. All related submittals shall be submitted simultaneously in the same submittal package.

B. Product Data: Include manufacturer's product specifications, standard details, certified product test results, installation methods, storage and handling requirements, and general recommendations, as applicable to materials and finishes for each component and for total panel assemblies.

C. Shop Drawings: Show layouts of panels on roofs, details of edge conditions, joints, panel profiles, supports, anchorages, trim, flashings, underlayment, closures, snow rails, penetration details, and special details. Distinguish between factory- and field-assembled work.

1. Manufacturer’s comments shall include extent of experience by manufacturer with each detail with this specific product under comparable conditions and point out any problems that have been encountered, as well as unique variations or details with which experience is limited. Installer shall recommend and make any detail modifications required to insure a proper and watertight system.

2. Show roofing system with flashings and accessories in plan and elevation; sections and details at scale of 3”=1’-0”.

3. Include metal thicknesses and finishes, panel lengths, joining details, anchorage details, flashings and special fabrication provisions for termination and penetrations. Submittal shall include manufacturer’s written comments, all fastener descriptions and spacings, sealant description and locations, bend radii, metal thicknesses and other pertinent information.

4. Indicate relationships with adjacent and interfacing work.

5. Shop drawings must be submitted and returned as acceptable prior to beginning field or factory fabrication.

6. Show work to be field-fabricated or field-assembled.

7. Shop drawings to include manufacturer review and approval prior to Architect submittal. Shop drawings not reviewed and stamped by manufacturer will be returned not reviewed.

8. Sample Warranty: Submit sample warranty(s) showing compliance of the contract requirements. This **MUST BE** submitted with shop drawings. Submittals made without sample warranty(s) will be returned as incomplete and not reviewed.

9. Submit written documentation that roof installer is certified installer for roof system submitted, executed by the roofing manufacturer.

D. Samples for Initial Selection: Manufacturer's actual color samples on roofing metal showing color, texture, and pattern for roof panels with factory-applied finishes in the indicated color. Paper selection sheets will not be accepted.

E. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

F. Product Test Reports: Indicate compliance of manufactured roof panel assemblies and materials with performance and other requirements based on comprehensive testing of current products.

G. Panel manufacturer shall submit certification that the panels will be tension leveled during the roll forming process.

H. Provide verification that the standing seam panels are factory roll formed and UL 90 rated.

I. Distinguish between factory and field assembly work.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed (5 minimum) metal roof panel projects similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated without delaying the Work, as documented according to ASTM E 699.

C. Pre-Installation Conference:

1. Conduct Pre-installation meeting at Project site before each construction activity that requires coordination with installation of preformed metal roofing system.

2. Other trades involved or affected by installation of metal roof system shall attend.

3. Review project requirements, approved submittals.

4. Review conditions under which roofing system will be installed.

5. Review progress of other construction activities and preparations for particular activity under consideration at each pre-installation conference.

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

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

D. ROOF INSPECTION AND DOCUMENTATION

1. SCOPE:

a. The Contractor is to provide and facilitate complete services for third party quality control roof inspections by manufacturers representative for all new roofing installations.

b. Services must include the following:

1. Review and approval of roofer’s qualifications.
2. Review and approval of roof shop drawings and action plan.

3. Attendance and documentation of pre-roofing conference, post roofing inspection,periodic inspections, directions, and conclusions. Documentation shall include electronic photographs of all deficiencies.
4. Attendance and documentation of minimum weekly periodic roofing progress review meeting/inspections, including all follow-up directions, and conclusions. Contractor shall be responsible for all required follow-up return inspections including post project review visits to address failures, including scheduling and any additional inspection costs.

c. The roofing contractor shall facilitate and coordinate manufacturer's inspections with the Construction Manager, Owner and Architect with notice given of meetings or inspections at least one week in advance.

d. The roofing contractor shall photo document each day's work including general views and detailed photographic views of the progress and electronically transmit to third party on a daily basis. Photo documentation shall include detail flashing conditions and items that will be concealed by future work. Roofing contractor shall provide additional photos or documentation as requested by manufacturer's. Inspector to review photos daily and document observations, concerns, and necessary corrections to the roofing contractor, general contractor, and Architect within 24 hours. Roofing contractor photos to be included with closeout documents via inspector, refer to "Closeout Documentation" below.

e. Repetitive faulty work performed by the roofing contractor may require additional on-site visits by third party inspectors. All inspector fees/costs due to additional inspections are the responsibility of the contractor. Additional inspections may be required by the architect upon the receipt of two notices of concern provided by the inspector.

f. Contractor to cooperate and coordinate with a representative of the Roof Manufacturer to attend the pre-roofing conference and post roofing inspection.

g. The roofing contractor shall be responsible for coordination, review, and confirmation that all corrective work is performed per roof covering manufacturer standards, for compliance with warranty requirements.

h. Warranty commences upon substantial completion and when all deficiencies noted by manufacturer's representatives, third party inspector, and Architect are completed. If deficiencies have not been corrected by the date of substantial completion the warranty will begin upon the date the deficiency repairs are completed and have been accepted.

i. CLOSEOUT DOCUMENTATION: Roofing contractor shall assemble and submit to the Architect, (3) three, 3 ring binders with project name clearly indicated on the binder covers, within 1 week following the completion of the roofing. The binders shall include copies of all inspection reports, a thumb drive of inspection photographs in JPG format, and a thumb drive of roof photo documentation from roofing contractor. Label thumb drives accordingly. Following review by the Architect, General contractor and the binders shall be revised, if needed, and resubmitted: 1 copy for Owner record, 1 copy for Architect record and 1 copy for roofing contractor record.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver panels and other components so they will not be damaged or deformed. Package panels for protection against damage during transportation or handling. All components shall be coated in cartons marked with manufacturer's name or trademark and UL90 label where applicable.

B. Handling: Exercise care in unloading, storing, and erecting roof panels to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight and ventilated covering. Store panels to ensure dryness. Do not store panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Trim with strippable film shall not be exposed to direct sunlight or extreme heat.

E. Protect all materials and installations from damage by other trades.

F. Do not allow material storage or traffic on installed panel surface.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify location of structural members and openings in substrates by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, either establish opening dimensions and proceed with fabricating roof panels without field measurements or allow for trimming panel units. Coordinate roof construction to ensure actual locations of structural members and to ensure opening dimensions correspond to established dimensions.

1.8 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of associated work installed by other sections as the work of this section proceeds.

B. Preinstallation Meeting: Convene one week before starting work of this section. Conduct preinstallation meeting with general contractor / construction manager, roofing manufacturer authorized representative, certified roofing installer and Architect / Owner.

1. Establish review time schedule: Roof manufacturer authorized representative will visit the project a minimum of two times during roof installation, and a minimum of one visit for final review in addition to preinstallation meeting. The roofing manufacturer representative will document and issue field inspection reports of visits within five calendar days to the General Contractor. Any corrective measures identified during visits will immediately be brought to the attention of the General Contractor / Construction Manager. Roofing manufacturer representative will include follow-up visits as required and final documentation identifying resolution of any and all issues.

2. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.9 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in

addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents. Warranties start on the date of Substantial Completion.

B. Finish Warranty: Provide manufacturer's special warranty covering failure of factoyr-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of 20 year period (no dollar limit) from date of Substantial Completion.

C. Special Watertight Warranty: Provide a written non pro-rated warranty executed by manufacturer agreeing to repair or replace metal roof panel system components and associated flashings and trim, that fails to remain watertight within the specified warranty period. Warranty period 20 years (no dollar limit).

D. Roof Installer Warranty: Provide a written, signed, non-prorated, roof installer warranty, text provided at the end of this section, agreeing to repair or replace roofing components that fail to remain watertight within the specified warranty period of two years from date of Substantial Completion. This warranty is between the roof installer and the Owner only and does not void or modify any manufacturer warranty requirements or any obligations between the roof installer and the roof manufacturer.

E. All (no dollar limit) statements refer to metal roof panel system components and associated trim that comprise the complete roof system.

PART 2 - PRODUCTS

2.1 STANDING-SEAM ROOF PANELS

A. General: Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide panels by one of the following:

1. Steel Roof Panels:

    a. IMETCO, Series 300, 16" panel width with two-tier step-up profile and mechanically seamed batten cap (Basis of Design)
    b. Berridge Manufacturing Co.
    c. Centria.
    d. Merchant & Evans
    e. Kalzip
    f. Bemo USA
    g. Architectural Building Components
    h. Metal Sales Manufacturing Corporation

2.3 PANEL MATERIALS

A. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755 (ASTM A 755M) and the following requirements:

1. Galvanized Steel Sheet: ASTM A 653, G90 (ASTM A 653M, Z275); structural quality.
2. Thickness: 24 ga., 0.028 inch (0.7 mm), unless otherwise indicated.
3. Finish: Apply the following organic coating in thickness indicated. Furnish appropriate air-drying spray finish in matching color for touchup.

    a. Fluoropolymer 2-Coat Coating System: Manufacturer's full range of standard, 2-coat, thermocured system composed of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight with a total minimum dry film thickness of 0.9 mil (0.023 mm) and 30 percent reflective gloss when tested according to ASTM D 523.

        1) Durability: Provide coating field tested under normal range of weather conditions for a minimum of 20 years without significant peel, blister, flake, chip, crack, or check in finish; without chalking in excess of a chalk rating of 8 according to ASTM D 4214; and without fading in excess of 5 Hunter units.
        2) Color: Finish to match IMETCO Standard and Metallic Colors, as selected by Architect from manufacturer’s full range.

B. Clips: Concealed Standard Anchor Clips: Two Hole Clips must be minimum 0.0625-inch (1.6-mm) thick, stainless-steel panel clips designed to meet negative-load requirements, one (1) piece clip with projecting legs for additional panel alignment and provision for unlimited thermal movement in each direction along the longitudinal dimensions.

1. Two-piece clips are NOT acceptable. Clip design must isolate sealant in panel cap from clip to insure that no sealant damage occurs from the clip during expansion and contraction. Clip must maintain a clearance of a minimum of 3/8” between panel and substrate for proper ventilation to help prevent condensation on underside of panel and eliminate the contact of panel fastener head to panel.

2. Bearing Plates: Install bearing plates directly over membrane underlayment and nailable rigid board insulation assembly at each anchor panel clip location along the centerlines of each roof panel joint.

    a. Provide 3-inch by 5-inch (76 mm by 127 mm) bearing plates of 16 gauge (minimum) stainless steel.

    b. Provide bearing plates with pre-punched hole pattern matching panel anchor clips. Slotted holes acceptable.

C. Seam cap: Snap-on cap shall be a minimum of 1” wide “T” shaped of continuous length up to 45 feet according to job conditions and field seamed by means of manufacturer’s standard seaming machine.

1. Cap shall be designed to receive two (2) beads of continuous hot applied gasketing sealant during manufacturing which will not come in contact with the anchor clip.

2. In all cases, seam caps shall be factory formed to insure quality and precision in the process of sealant application.

D. Standing Seam Panel Width: 16” (nominal).

E. Standing Seam Panel Height: 2” (nominal).

F. Replaceability: Panels shall be of a symmetrical design with mechanically seamed cap configuration such that individual panels may be removable for replacement without removing adjacent panels.

G. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.4 UNDERLAYMENT MATERIALS:

A. Self-Adhering, High-Temperature Sheet: 40 mils thick minimum, consisting of slip- resisting, polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.

1. IMETCO "Aqua Block 40"

2. Viking UDL High Temp Underlayment

B. Slip Sheet: Manufacturer's recommended slip sheet, of type required for application.

2.5 MISCELLANEOUS MATERIALS

A. General: Provide materials and accessories required for a complete roof panel assembly and as recommended by panel manufacturer, unless otherwise indicated.

B. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads.

1. Use stainless-steel fasteners for exterior applications and galvanized steel fasteners for interior applications.

C. Accessories: Unless otherwise specified, provide components required for a complete roof panel assembly including, ridge closures, clips, seam covers, battens, sealants, gaskets, fillers, closure strips, and similar items. Match materials and finishes of panels.

1. Closure Strips: Closed-cell, self-extinguishing, expanded, cellular, rubber or cross-linked, polyolefin-foam flexible closure strips. Cut or premold to match configuration of panels. Provide closure strips where indicated or necessary to ensure watertight construction.
2. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.
3. Elastomeric Joint Sealant: ASTM C 920, of base polymer, type, grade, class, and use classifications required to seal joints in panel roofing and remain weathertight. Provide sealant recommended by panel manufacturer.

D. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat, unless otherwise indicated. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

E. Primer: Rust-inhibitive primer recommended by panel manufacturer for finish coat.

F. Snow Rails: Prefabricated, non-corrosive units designed to be installed without penetrating metal roof panels and complete with pre-drilled holes, clamps, war hooks for anchoring.

1. Seam mounted, stocked type snow rals, aluminum stops designed for attachment to vertical ribs of standing seam metal roof panels with stainless steel set screws:

A. Available products

1) S5 Aluminum Sno-Fence as manufactured by Metal Roof Innovations Limited, 8655 Table Butte Road, Colorado Springs, Colorado 80908, or approved equal. Equality shall be based upon lab-tested load to failure value.

2) Install snow rails in a manner recommended by roofing and snow rail manufacturers.

B. Snow Clips

1) Install snow clips in a manner recommended by roofing and snow guard manufacturers.

2) Locate where indicated on drawings.

3) Install (two) Sno-Clips per roof panel.

2.6 FABRICATION

A. General: Fabricate and finish panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

1. Manufactured panels shall be supplied in continuous lengths equal to the total length of the roof plane from ridge to eave.
2. Portable roll formers are approved provided that the machine is specifically designed to produce the profile indicated and to the same standard as factory-produced units.
3. Fabricate trim and flashings from same material as roof system.
4. Panels shall be 16 ½” on center with minimum seam height of 2” inches.
5. Underside of panels to be protected by a polyester washcoat with a dry film thickness of .3 mils.
6. All panels shall be inline tension leveled, Rigid Profile Texture Striations similar to the Basis-of-Design product are allowed.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements indicated for conditions affecting performance of metal panel roofing.

1. Inspect roof deck to verify deck is even, smooth, sound and free of depressions, waves or projections and properly sloped.

2. Installer shall examine all substrates on which work is to be applied. Any surface not suitable for application of metal panel system shall be conveyed in writing to the Architect.
3. Do not proceed with roof panel installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate metal panel roofing with rain drainage work; flashing; trim; and construction of decks, parapets, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

B. Promptly remove protective film, if any, from exposed surfaces of metal panels. Strip with care to avoid damage to finish.

C. Underlayment: Install roofing underlayment on uppermost face or roof insulation assembly, primed if required by underlayment manufacturer, before installing preformed metal roof panels. Secure as recommended by underlayment manufacturer. Apply in shingle fashion, overlapping horizontal joints as recommended by underlayment manufacturer and approved shop drawings.

D. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.

E. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.3 PANEL INSTALLATION

A. Insulation: Install insulation and/or nailable insulation board on approved structural deck as recommended by manufacturer for design criteria of project. Nailable insulation to be applied at the uppermost portion of insulation assembly as a direct substrate for underlayment and metal roof assembly.

B. General: Comply with panel manufacturer's written instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cutting exterior panels by torch is not permitted.
2. Install panels with concealed fasteners, unless otherwise indicated.
3. Conform to standards set forth in the SMACNA architectural sheet metal manuals.
4. Install panels plumb, level and straight with seams and ribs parallel, conforming to the design as indicated.
5. Install panels so that they are watertight.
6. Install panels without waves, warps, buckles or distortions; and allow for expansion and contraction. Exercise care in handling panels and trim to prevent surface damage.
7. Ribbed pans will be vertically broken under ridges and hooked at the eaves to insure weathertightness.
8. Remove masking on trim flashing immediately after installation.
9. Hem all raw edges on flashings.
10. Install panels over solid substrate with minimum slopes as indicated. Install 1 ply of underlayment from lower edge up, with at least 3-inch (75-mm) side laps and 4-inch (100-mm) end laps.

11. Coordinate installation to ensure that roof panel fasteners do not hit nailable insulation joints.

C. Accessories: Install components required for a complete roof panel assembly including, ridge closures, clips, seam covers, battens, sealants, gaskets, fillers, closure strips, and similar items.

D. Gutters and Downspout Coordination:

1. Roof Installer shall be responsible for effectively flashing to gutter system and fabricating watertight installation at gutters.

2. Flashing interface of metal roof system with continuous gutter and for flashing interface of metal roof system with metal wall panels shall be covered by roofing warranties issued in accordance with requirements specified.

E. Flashing:

1. Comply with SMACNA "Architectural Sheet Metal Manual" recommendations for installation of work.
2. Allow for thermal expansion of exposed sheet metal work exceeding 15'-0" running length maximum.
3. For flashing and trim, space expansion joints maximum 10'-0" located 2'-0" from corners and intersections.
4. Conceal fasteners and expansion provisions wherever possible.
5. Fold back edges of concealed side of exposed edge to form hem.
6. Insert metal flashings into reglets, anchor with fasteners and wedges and seal joints.
7. Set sheet metal items level, true to line, and plumb.
8. Secure to wood with screws and washers.
9. Set metal already partly formed in place and fasten by means of cleats.
10. Use cleats to keep laps closed when face width exceeds 8" for 24 gage steel.

F. Separate dissimilar metals by painting each metal surface in area of contact with a bituminous coating, by applying rubberized-asphalt underlayment to each metal surface, or by other permanent separation as recommended by manufacturers of dissimilar metals.

G. Install underlayment sheet on roof deck under metal panels, as recommended by panel manufacturer. Use adhesive for temporary anchorage, where possible, to minimize use of mechanical fasteners under metal panels. Apply from eave to ridge in shingle fashion and lap joints a minimum of 2 inches (50 mm).

H. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not otherwise indicated, types recommended by panel manufacturer.

1. Install weatherseal under ridge cap. Flash and seal panels at eave and rake with rubber, neoprene, or other closures to exclude weather.
2. Seal panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by panel manufacturer.

I. Standing-Seam Roof Panel Assembly: Fasten panels to supports with concealed clip according to panel manufacturer's written instructions.

1. Install clips at each support with self-drilling/self-tapping fasteners.
2. At end laps of panels, install tape calk between panels.

J. Installation Tolerances: Shim and align panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.4 CLEANING AND PROTECTING

A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.

B. Damaged Units: Replace panels and other components of the Work that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

C. Cleaning: Remove temporary protective coverings and strippable films, if any, as soon as each panel is installed. On completion of panel installation, clean finished surfaces as recommended by panel manufacturer and maintain in a clean condition during construction.

D. Dispose of excess materials and debris from the job site.

E. Thoroughly clean and touch-up any areas scarred during installation with a touch-up paint.

F. To prevent rust staining on finished surfaces, immediately remove fillings caused by drilling or cutting or ends of pop rivets.

G. Touch up exposed fasteners using paint furnished by roofing panel manufacturer and match exposed panel surface finished.

H. Touch up, repair, or replace damaged roof panels or accessories before date of Substantial Completion.

3.5 WARRANTY

A. WHEREAS <Insert Name> of <Insert Address>, herein called the “Roofing Installer”, has performed roofing and associated work (“work”) on the following project:

1. Owner: <Insert name of Owner>,
2. Address: <Insert Address>,
3. Building Name/Type: <Insert Information>,
4. Address: <Insert Address>,
5. Area of Work: <Insert Information>,
6. Acceptance Date: <Insert Date>,
7. Warranty Period: <Insert Date>,
8. Expiration Date: <Insert Date>,

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacement of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

E. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

1. lightning;
2. peak gust wind speed exceeding 90 mph;
3. fire;
4. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
5. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
6. vapor condensation on bottom of roofing; and
7. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

F. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designed.

G. Roofing Installer is responsible for damage to work covered by this Warranty.

H. During Warranty Period, if Owner allows alteration of work by anyone other that Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.

I. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

J. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.

K. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

L. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, <Insert year>.

1. Authorized Signature: <Insert signature>.
2. Name: <Insert name>
3. Title: <Insert title>

END OF SECTION 074113

SECTION 074213 - FORMED METAL WALL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Concealed-fastener, lap-seam metal wall panels.

1.3 PREINSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal panel assembly during and after installation.
8. Review of procedures for repair of metal panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied finishes.

1. Include Samples of trim and accessories involving color selection.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. UL-Certified, Portable Roll-Forming Equipment: UL-certified, portable roll-forming equipment capable of producing metal panels warranted by manufacturer to be the same as factory-formed products. Maintain UL certification of portable roll-forming equipment for duration of work.

C. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly 4'-0 high by 8'-0" long as part of the masonry assembly mockup panel., including corner, supports, attachments, and accessories.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of

water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

E. Copper Panels: Wear gloves when handling to prevent fingerprints and soiling of surface.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal panels to be performed according to manufacturers' written instructions and warranty requirements.

1.10 COORDINATION

A. Coordinate metal panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including rupturing, cracking, or puncturing.
b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Ten years from date of Substantial Completion.

B. Special Warranty on 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. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 2.86 lbf/sq. ft. (137 Pa).

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 CONCEALED-FASTENER, LAP-SEAM METAL WALL PANELS

A. General: Provide factory-formed metal panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.

B. Ribbed-Profile, Concealed-Fastener Metal Wall Panels.: Formed with raised, trapezoidal ribs.

1. Product: Subject to compliance with requirements, provide:

a. Imetco, Latitude Series LW125-4.
b. Centria Inc.
c. Firestone Building Products

2. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653/A 653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792/A 792M, Class AZ50 (Class AZM150) coating designation; structural quality. Pre-painted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Nominal Thickness: 0.028 inch (0.71 mm).
b. Exterior Finish: Two-coat fluoropolymer.
c. Color: As selected by Architect from manufacturer's full range.

3. Panel Coverage: 12 inches (305 mm).
4. Panel Height: 0.875 inch (22 mm).
5. Miscellaneous Furring: Metal Z-Furring 1 1/2" and 3" deep as indicated in drawings.

2.3 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z275 hot-dip galvanized) coating designation or ASTM A 792/A 792M, Class AZ50 (Class AZM150) aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fasciae, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same metal as metal panels.

2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch-(25-mm-) thick, flexible closure strips; cut or premolded to match metal panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal panels by means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
2. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.4 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

D. Fabricate metal panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

E. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

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.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Steel Panels and Accessories:

1. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

1. Examine wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.

    a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and systems penetrating metal panels to verify actual locations of penetrations relative to seam locations of metal panels before installation.

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

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal panel manufacturer's written recommendations.

3.3 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Flash and seal metal panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Steel Panels: Use stainless-steel fasteners for surfaces exposed to the exterior; use galvanized-steel fasteners for surfaces exposed to the interior.
2. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.
3. Copper Panels: Use copper, stainless-steel, or hardware-bronze fasteners.
4. Stainless-Steel Panels: Use stainless-steel fasteners.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Lap-Seam Metal Panels: Fasten metal panels to supports with fasteners at each lapped joint at location and spacing recommended by manufacturer.

1. Lap ribbed or fluted sheets one full rib. Apply panels and associated items true to line for neat and weathertight enclosure.
2. Provide metal-backed washers under heads of exposed fasteners bearing on weather side of metal panels.
3. Install screw fasteners with power tools having controlled torque adjusted to compress washer tightly without damage to washer, screw threads, or panels. Install screws in predrilled holes.
4. Flash and seal panels with weather closures at perimeter of all openings.

E. Watertight Installation:

1. Apply a continuous ribbon of sealant or tape to seal lapped joints of metal panels, using sealant or tape as recommend by manufacturer on side laps of nesting-type panels; and elsewhere as needed to make panels watertight.

2. Provide sealant or tape between panels and protruding equipment, vents, and accessories.
3. At panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with sealant and fastened together by interlocking clamping plates.

F. Accessory Installation: 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 panel system including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal wall panel manufacturer; or, if not indicated, provide types recommended by metal panel manufacturer.

G. 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 are permanently watertight.

1. Install exposed flashing and trim that is without 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 achieve waterproof 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 (610 mm) of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

B. After metal panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Formed roof-drainage sheet metal fabrications.
   2. Formed wall sheet metal fabrications.

B. Related Requirements:
   1. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.
   1. Include plans, elevations, sections, and attachment details.
   2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
   3. Include identification of material, thickness, weight, and finish for each item and location in Project.
   4. Include details for forming, including profiles, shapes, seams, and dimensions.
   5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
   6. Include details of termination points and assemblies.
   7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
   8. Include details of roof-penetration flashing.
   9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
   10. Include details of special conditions.
   11. Include details of connections to adjoining work.

12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches (1:10).

1.5 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.9 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
   2. Finish Warranty Period: 20 years from date of Substantial Completion.
   3. The total system, no dollar limit guarantee, shall cover work of this section, including:
      a. Exposed trim and fascia
      b. Metal Flashings
      c. Gutters and Downspouts

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to

defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. FM Approvals Listing: Manufacture and install roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.

D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
   1. Design Pressure: As indicated on Drawings.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
   1. As-Milled Finish: Mill.
   2. Alclad Finish: Metallurgically bonded surfacing alloy on both sides, forming aluminum sheet with reflective luster.
   3. Factory Prime Coating: Where painting after installation is required, pretreat metal with white or light-colored, factory-applied, baked-on epoxy primer coat; minimum dry film thickness of 0.2 mil (0.005 mm).
   4. Clear Anodic Finish, Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
   5. Exposed Coil-Coated Finish:
      a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   6. Color: As selected by Architect from manufacturer's full range.
   7. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

C. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation; prepainted by coil-coating process to comply with ASTM A 755/A 755M.
   1. Surface: Smooth, flat.
   2. Exposed Coil-Coated Finish:

a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

3. Color: As selected by Architect from manufacturer's full range.
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
4. Fasteners for Zinc-Tin Alloy-Coated Stainless-Steel Sheet: Series 300 stainless steel.

C. Solder:
1. For Copper: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead.
2. For Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless-steel sheet manufacturer.
3. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane 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.

G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.

H. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
   1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
   2. Obtain field measurements for accurate fit before shop fabrication.
   3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
   4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

D. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
   1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
   2. Use lapped expansion joints only where indicated on Drawings.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.

G. Do not use graphite pencils to mark metal surfaces.

2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch-(2400-mm-) long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
   1. Expansion Joints: Lap type.
   2. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen.
   3. Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following materials:
      a. Galvanized Steel: 0.022 inch (0.56 mm) thick.

B. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.
   1. Fabricated Hanger Style: Fig 1-35B according to SMACNA's "Architectural Sheet Metal Manual."
   2. Fabricate from the following materials:
      a. Galvanized Steel: 0.022 inch (0.56 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
   1. Verify compliance with requirements for installation tolerances of substrates.
   2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
   3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

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

3.2 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, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
   1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
   2. 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.
   3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
   4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
   5. Torch cutting of sheet metal flashing and trim is not permitted.
   6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
   1. Coat concealed side of uncoated-aluminum sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.3 ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters: Join sections with joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
1. Fasten gutter spacers to front and back of gutter.
2. Anchor and loosely lock back edge of gutter to continuous cleat.
3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches (600 mm) apart.
4. Anchor gutter with gutter brackets spaced not more than 36 inches (910 mm) apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
5. Anchor gutter with spikes and ferrules spaced not more than 24 inches (600 mm) apart.
6. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet (15.24 m) apart. Install expansion-joint caps.
7. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.
1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c.
2. Provide elbows at base of downspout to direct water away from building.
3. Connect downspouts to underground drainage system.

3.4 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.5 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Non-staining silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.

1.3 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

a. Include test results performed on joint sealants after they have cured for 1 year.

C. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single source manufacturer for each different product required.

1.6 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 NONSTAINING SILICONE JOINT SEALANTS

A. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Sika Corporation
b. Sonneborn Building Products Division ChemRex, Inc.
c. Tremco, Inc.
d. W.R. Meadows, Inc.

2.3 URETHANE JOINT SEALANTS

A. Urethane, S, NS, 25, T, NT: Single-component, non-sag, plus 25 percent and minus 25 percent movement capability, traffic- and non-traffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Uses T and NT.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Sika Corporation
b. Sonneborn Building Products Division ChemRex, Inc.
c. Tremco, Inc.

d. W.R. Meadows, Inc.

2.4 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Pecora Corp.
b. Protective Treatments, Inc.
c. Tremco, Inc.

2.5 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Non-staining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. 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.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.6 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, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

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

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.

3. 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. Nonporous joint substrates include the following:

    a. Glass.
    b. Glazed surfaces of ceramic tile.

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.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. 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.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. 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.

F. Tooling of Non-sag 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 C 1193 unless otherwise indicated.
4. Provide flush joint profile at where indicated according to Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at where indicated according to Figure 8C in ASTM C 1193.

    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:

    a. Isolation and contraction joints in cast-in-place concrete slabs.

2. Joint Sealant: Urethane, M, P, 50, T, NT.
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 non-traffic surfaces.

1. Joint Locations:

    a. Control and expansion joints in unit masonry.
    b. Perimeter joints between materials listed above and frames of doors, windows, and louvers.

c. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, non-staining, S, NS, 50, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

1. Joint Locations:

a. Isolation joints in cast-in-place concrete slabs.
b. Control and expansion joints in tile flooring.

2. Joint Sealant: Urethane, S, P, 25, T, NT.
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. Vertical joints on exposed surfaces of unit masonry.

2. Joint Sealant: Urethane, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

E. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.

1. Joint Locations:

a. Control joints on exposed interior surfaces of exterior walls.
b. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Acrylic latex.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 081113 - HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes hollow-metal work.

B. Related Requirements:

1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, and finishes.

B. Shop Drawings: Include the following:

1. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
2. Locations of reinforcement and preparations for hardware.
3. Details of each different wall opening condition.
4. Details of anchorages, joints, field splices, and connections.
5. Details of accessories.
6. Details of moldings, removable stops, and glazing.
7. Details of conduit and preparations for power, signal, and control systems.

C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch-(102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Amweld International, LLC.
2. Ceco Door; ASSA ABLOY.
3. Curries Company; ASSA ABLOY.
4. Deansteel Manufacturing Company, Inc.
5. Fleming Door Products Ltd.; Assa Abloy Group Company.
6. Mesker Door Inc.
7. Republic Doors and Frames.
8. Steelcraft; an Allegion brand.
9. Metal Products, Inc., Corbin, Kentucky

B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 REGULATORY REQUIREMENTS

A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.3 INTERIOR DOORS AND FRAMES

A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2...

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:

a. Type: All interior hollow metal doors and frames listed in the Door and Frame Schedule.
b. Thickness: 1-3/4 inches (44.5 mm).
c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch (1.0 mm).
d. Edge Construction: Model 1, Full Flush.
e. Core: Kraft-paper honeycomb.
f. Fire-Rated Construction: Each door assembly in a fire rated construction needs to be properly labeled per NFPA requirements.

3. Frames:

a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
b. Non-Fire Rated Construction: Knocked down.
c. Fire-Rated Construction: Fully Welded Type.

1) Fire Rating: Same as door, labeled.

4. Exposed Finish: Prime.
5. Galvanizing for Units in Wet Areas: All components hot-dipped zinc-iron alloy coated (galvannealed), manufacturer's standard coating thickness.

2.4 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
3. Post-installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-(9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.5 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

G. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

H. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

I. Glazing: Comply with requirements in Section 088000 "Glazing."

J. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.6 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.

1. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
5. Jamb Anchors: Provide number and spacing of anchors as follows:

a. Masonry Type: Locate anchors not more than 16 inches (406 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c., to match coursing, and as follows:

1) Two anchors per jamb up to 60 inches (1524 mm) high.
2) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.

3) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
4) Four anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.

b. Stud-Wall Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as follows:

1) Three anchors per jamb up to 60 inches (1524 mm) high.
2) Four anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
3) Five anchors per jamb from 90 to 96 inches (2286 to 2438 mm) high.
4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 96 inches (2438 mm) high.

c. Post-installed Expansion Type: Locate anchors not more than 6 inches (152 mm) from top and bottom of frame. Space anchors not more than 26 inches (660 mm) o.c.

C. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive non-templated, mortised, and surface-mounted door hardware.
2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow-metal work.
5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.7 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.8 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. At fire-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable stops located on secure side of opening.
    d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    f. Field apply bituminous coating to backs of frames that will be filled with grout containing anti-freezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.

3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
5. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
6. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

    a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

C. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

    1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 081113

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Requirements:

1. Section 088000 "Glazing" for glass view panels in flush wood doors.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:

1. Dimensions and locations of blocking.
2. Dimensions and locations of mortises and holes for hardware.
3. Dimensions and locations of cutouts.
4. Undercuts.
5. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.
7. Fire-protection ratings for fire-rated doors.

C. Samples for Initial Selection: For factory-finished doors.

D. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during remainder of construction period.

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Algoma Hardwoods, Inc.
2. Eggers Industries.
3. Graham Wood Doors; ASSA ABLOY Group company.
4. Haley Brothers, Inc.
5. Marshfield DoorSystems, Inc.
6. Mohawk Flush Doors, Inc.
7. Oshkosh Door Company.

2.2 FLUSH WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."

B. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.

C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
3. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

D. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, Grade LD-2.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

    a. 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
    b. 5-inch (125-mm) bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
    c. 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.
    d. The requirements above are minimums. Coordinate with door hardware to provide appropriately sized blocking.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors.:

1. Grade: Premium, with Grade A faces.
2. Species: Match existing (assumed Red Oak)
3. Cut: Match existing (assumed Plain sliced (flat sliced).
4. Match between Veneer Leaves: Pleasing match.
5. Assembly of Veneer Leaves on Door Faces: Running match.
6. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
7. Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by 20 feet (6 m) or more.
8. Exposed Vertical and Top Edges: Same species as faces or a compatible species - edge Type A.
9. Core: Particleboard.
10. Construction: Five or seven plies. Stiles and rails are bonded to core then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.
11. WDMA I.S.1-A Performance Grade: Extra Heavy Duty.

2.4 LIGHT FRAMES AND LOUVERS

A. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.

1. Wood Species: Species compatible with door faces.
2. Profile: Flush rectangular beads.

3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.

B. Wood-Veneered Beads for Light Openings in Fire-Rated Doors: Manufacturer's standard wood-veneered noncombustible beads matching veneer species of door faces and approved for use in doors of fire-protection rating indicated. Include concealed metal glazing clips where required for opening size and fire-protection rating indicated.

2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.

1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

C. Openings: Factory cut and trim openings through doors.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."

2.6 FACTORY FINISHING

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.

B. Factory finish doors.

C. Transparent Finish:

1. Grade: Premium.
2. Finish: Match existing (assumed WDMA TR-6 catalyzed polyurethane)
3. Staining: Match existing (assumed as selected by Architect from manufacturer's full range)
4. Sheen: Match existing (assumed Semigloss)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

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

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware."

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

1. Install fire-rated doors according to NFPA 80.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081416

SECTION 084100 - ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following types of aluminum entrance and storefront work:

1. Interior entrance doors.
2. Storefront-type framing system.

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Glazing requirements for aluminum entrances and storefront, including entrances specified to be factory glazed, are included in Division 8 Section "Glazing."
2. Lock cylinders are included in Division 8 Section "Finish Hardware."

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide aluminum entrance and storefront assemblies that comply with performance characteristics specified, as demonstrated by testing the manufacturer's corresponding stock assemblies according to test methods indicated.

B. Thermal Movement: Design the aluminum entrance and storefront framing systems to provide for expansion and contraction of the component materials. Entrance doors shall function normally over the specified temperature range.

1. The system shall be capable of withstanding a metal surface temperature range of 180 deg F (100 deg C) without buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, stress on glass, or other detrimental effects.

C. Design Requirements: Provide aluminum entrance and storefront systems that comply with structural performance, air infiltration, and water penetration requirements indicated.
1. Wind Loads: Provide aluminum entrance and storefront assemblies capable of withstanding wind pressures of 20 psf (958 Pa) inward and 20 psf (958 Pa) outward acting normal to the plane of the wall.

D. Structural Performance: Conduct tests for structural performance in accordance with ASTM E 330. At the conclusion of tests, there shall be no glass breakage or permanent damage to fasteners, anchors, hardware or actuating mechanism. Framing members shall have no permanent deformation in excess of 0.2 percent of their clear span.

1. Deflection Normal to the Plane of the Wall: Test pressure required to measure deflection of framing members normal to the plane of the wall shall be equivalent to the wind load specified above. Deflection shall not exceed 1/175 of the clear span, when subjected to uniform load deflection test.
2. Deflection Parallel to the Plane of the Wall: Test pressures required to measure deflection parallel to the plane of the wall shall be equal to 1.5 times the wind pressures spe

cified above. Deflection of any member carrying its full dead load shall not exceed an amount that will reduce glass bite below 75 percent of the design dimension and shall not reduce the edge clearance between the member and the fixed panel, glass or other fixed member above to less than 1/8 inch (3 mm). The clearance between the member and an operable door or window shall be at least 1/16 inch (1.6 mm).

E. Air Infiltration: Provide aluminum entrance and storefront framing system with an air infiltration rate of not more than 0.06 cfm per sq. ft. (0.3 L/s x sq. m) of fixed area (excluding operable door edges) when tested in accordance with ASTM E 283 at an inward test pressure differential of 1.57 psf (75 Pa).

F. Water Penetration: Provide framing systems with no uncontrolled water penetration (excluding operable door edges) as defined in the test method when tested in accordance with ASTM E 331 at an inward test pressure differential of 6.24 lbf per sq. ft. (299 Pa).

G. Condensation Resistance: Where framing systems are "thermal-break" construction, provide units tested for thermal performance in accordance with AAMA 1503 showing condensation resistance factor (CRF) of not less than 57.

H. Thermal Transmittance: Provide framing systems that have an overall U-value of not more than 0.56 BTU/hr x sq. ft. x deg F (3.7 W/sq. m x K) at 15 mph (24 kph) exterior wind velocity when tested in accordance with AAMA 1503.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

1. Product data for each aluminum entrance and storefront system required, including:

   a. Manufacturer's standard details and fabrication methods.
   b. Data on finishing, hardware and accessories.
   c. Recommendations for maintenance and cleaning of exterior surfaces.

2. Shop drawings for each aluminum entrance and storefront system required, including:

   a. Layout and installation details, including relationship to adjacent work.
   b. Elevations at 1/4 inch = 1 foot (1:50) scale.
   c. Detail sections of typical composite members.
   d. Anchors and reinforcement.
   e. Hardware mounting heights.
   f. Provisions for expansion and contraction.
   g. Glazing details.

3. Samples for Initial Color Selection: Submit pairs of samples of each specified color and finish on 12-inch (300-mm) long sections of extrusions or formed shapes. Where normal color variations are anticipated, include 2 or more units in each set of samples indicating extreme limits of color variations.
4. Samples for Verification Purposes: The Architect reserves the right to require additional samples, that show fabrication techniques and workmanship, and design of hardware and accessories.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed installations of aluminum storefront and entrances similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer's Qualifications: Provide aluminum entrances and storefront systems produced by a firm experienced in manufacturing systems that are similar to those indicated for this project and that have a record of successful in-service performance for a period of 5 years.

C. Single Source Responsibility: Obtain aluminum entrance and storefront systems from one source and from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver aluminum entrance and storefront components in the manufacturer's original protective packaging.

B. Store aluminum components in a clean dry location away from uncured masonry or concrete. Cover components with waterproof paper, tarpaulin or polyethylene sheeting in a manner to permit circulation of air.

1. Stack framing components in a manner that will prevent bending and avoid significant or permanent damage.

1.7 PROJECT CONDITIONS

A. Field Measurements: Check openings by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work.

1. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit.

1.8 WARRANTY

A. Warranty: Submit a written warranty, executed by the manufacturer and signed by Contractor and Installer, agreeing to repair or replace units that fail in materials or workmanship within the specified warranty period. Failures include, but are not necessarily limited to:

1. Structural failures including excessive deflection, excessive leakage or air infiltration.
2. Faulty operation.
3. Deterioration of metals, metal finishes and other materials beyond normal weathering.

B. Warranty Period: 5 years after the date of Substantial Completion.

C. The warranty shall not deprive the Owner of other rights or remedies the Owner may have under other provisions of the Contract Documents, and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide entrance and storefront systems manufactured by one of the following:

1. Amarlite Architectural Products.
2. CMI-Cronstroms Mfg. Inc.
3. EFCO Corporation.
4. Kawneer Company, Inc. (NuCore)**
5. PPG Industries.
6. Tubelite Division of Indal, Inc.
7. United States Aluminum Corp.
8. Vistawall Architectural Products.
9. Fabricated Aluminum Systems, Inc.
10. YKK AP America Inc.

**Denotes manufacturer and system upon which specification is based.

2.2 MATERIALS

A. Aluminum Members: Alloy and temper recommended by the manufacturer for strength, corrosion resistance, and application of required finish; comply with ASTM B 221 (ASTM B 221M) for aluminum extrusions, ASTM B 209 (ASTM B 209M) for aluminum sheet or plate, and ASTM B 211 (ASTM B 211M) for aluminum bars, rods and wire.

B. Carbon steel reinforcement of aluminum framing members shall comply with ASTM A 36 (ASTM A 36M) for structural shapes, plates and bars, ASTM A 611 for cold rolled sheet and strip, or ASTM A 570 (ASTM A 570M) for hot rolled sheet and strip.

C. Glass and Glazing Materials: Comply with requirements of "Glass and Glazing" section of these specifications.

D. Fasteners: Provide fasteners of aluminum, nonmagnetic stainless steel, zinc plated steel, or other material warranted by the manufacturer to be noncorrosive and compatible with aluminum components, hardware, anchors and other components.

1. Reinforcement: Where fasteners screw-anchor into aluminum members less than 0.125 inches (3.2 mm) thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard noncorrosive pressed-in splined grommet nuts.
2. Exposed Fasteners: Do not use exposed fasteners except for application of hardware. For application of hardware, use Phillips flat-head machine screws that match the finish of member or hardware being fastened.

E. Concealed Flashing: 0.0179-inch (0.5-mm) minimum dead-soft stainless steel, or 0.026-inch (0.7-mm) thick minimum extruded aluminum of alloy and type selected by manufacturer for compatibility with other components.

F. Brackets and Reinforcements: Provide high-strength aluminum brackets and reinforcements; where use of aluminum is not feasible provide nonmagnetic stainless steel or hot-dip galvanized steel complying with ASTM A 123.

G. Concrete and Masonry Inserts: Provide cast iron, malleable iron, or hot-dip galvanized steel inserts complying with ASTM A 123.

H. Compression Weatherstripping: Manufacturer's standard replaceable compressible weatherstripping gaskets of molded neoprene complying with ASTM D 2000 or molded PVC complying with ASTM D 2287.

I. Sliding Weatherstripping: Manufacturer's standard replaceable weatherstripping of wool, polypropylene, or nylon woven pile, with nylon fabric or aluminum strip backing, complying with AAMA 701.2.

2.3 COMPONENTS

A. Storefront Framing System: Provide storefront and entrance framing systems fabricated from extruded aluminum members of size and profile indicated. Include subframes and other reinforcing members of the type indicated. Provide for flush glazing storefront from the exterior on all sides without projecting stops. Shop-fabricate and preassemble frame components where possible. Provide storefront frame sections without exposed seams.

1. Mullion Configurations: Provide pockets at the inside glazing face to receive resilient elastomeric glazing. Mullions and horizontals shall be one piece. Make provisions to drain moisture accumulation to the exterior.

B. Stile-and-Rail Type Entrance Doors: Provide tubular frame members, fabricated with mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or j-bolts.

1. Glazing: Fabricate doors to facilitate replacement of glass or panels, without disassembly of stiles and rails. Provide snap-on extruded aluminum glazing stops, with exterior stops anchored for nonremoval.
2. Design: Provide 1-3/4-inch (44-mm) thick doors of design indicated.
3. Design: Provide 1-3/4-inch (44-mm) thick doors of design indicated.
4. Lights: Provide glazed openings as indicated, with aluminum moldings and stops. Provide nonremovable stops on the exterior.

2.4 FABRICATION

A. General: Fabricate aluminum entrance and storefront components to designs, sizes and thicknesses indicated and to comply with indicated standards. Sizes and profile requirements are indicated on the drawings. Variable dimensions are indicated, with maximum and minimum dimensions required, to achieve design requirements and coordination with other work.

1. Thermal-Break Construction: Fabricate storefront framing system with an integrally concealed, low-conductance thermal barrier, located between exterior materials and exposed interior members to eliminate direct metal-to-metal contact. Use manufacturer's standard construction that has been in use for similar projects for period of not less than 3 years.

B. Prefabrication: Complete fabrication, assembly, finishing, hardware application, and other work to the greatest extent possible before shipment to the Project site. Disassemble components only as necessary for shipment and installation.

1. Perform fabrication operations, including cutting, fitting, forming, drilling and grinding of metal work to prevent damage to exposed finish surfaces. Complete these operations for hardware prior to application of finishes.

2. Do not drill and tap for surface-mounted hardware items until time of installation at project site.
3. Preglaze door and frame units to greatest extent possible.

C. Welding: Comply with AWS recommendations. Grind exposed welds smooth to remove weld spatter and welding oxides. Restore mechanical finish.

1. Welding behind finished surfaces shall be performed in such a manner as to minimize distortion and discoloration on the finished surface.

D. Reinforcing: Install reinforcing as required for hardware and as necessary for performance requirements, sag resistance and rigidity.

E. Dissimilar Metals: Separate dissimilar metals with bituminous paint, or a suitable sealant, or a nonabsorptive plastic or elastomeric tape, or a gasket between the surfaces. Do not use coatings containing lead.

F. Continuity: Maintain accurate relation of planes and angles with hairline fit of contacting members.

1. Uniformity of Metal Finish: Abutting extruded aluminum members shall not have an integral color or texture variation greater than half the range indicated in the sample pair submittal.

G. Fasteners: Conceal fasteners wherever possible.

H. Weatherstripping: For exterior doors, provide compression weatherstripping against fixed stops. At other edges, provide sliding weatherstripping retained in adjustable strip mortised into door edge.

1. Provide EPDM or vinyl-blade gasket weatherstripping in bottom door rail, adjustable for contact with threshold.
2. At interior doors and other locations without weatherstripping, provide neoprene silencers on stops to prevent metal-to-metal contact.

2.5 FINISHES

A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.

B. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

C. Finish aluminum entrance and storefront to match adjacent glazed aluminum curtain wall components. Refer to "Glazed Aluminum Curtain Wall" Section for finish requirements.

D. High Performance Organic Coating: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: chemical conversion coating, acid chromate-fluoride-phosphate pretreatment; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.

1. Fluorocarbon 2-Coat Coating System: Manufacturer's standard 2-coat thermo-cured system, composed of specially formulated inhibitive primer and fluorocarbon color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; comply with AAMA 605.2.

2. Color and Gloss: To be selected from manufacturer’s standard Fluropon colors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and supports, with the Installer present, for compliance with requirements indicated, installation tolerances, and other conditions that affect installation of aluminum entrances and storefronts. Correct unsatisfactory conditions before proceeding with the installation.

1. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Comply with manufacturer's instructions and recommendations for installation.

B. Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Install components in proper alignment and relation to established lines and grades indicated. Provide proper support and anchor securely in place.

C. Construction Tolerances: Install aluminum entrance and storefront to comply with the following tolerances:

1. Variation from Plane: Do not exceed 1/8 inch in 12 feet (3 mm in 8.7 m) of length or 1/4 inch (6 mm) in any total length.
2. Offset from Alignment: The maximum offset from true alignment between two identical members abutting end to end in line shall not exceed 1/16 inch (1.5 mm).
3. Diagonal Measurements: The maximum difference in diagonal measurements shall not exceed 1/8 inch (3 mm).
4. Offset at Corners: The maximum out-of-plane offset of framing at corners shall not exceed 1/32 inch (0.8 mm).

D. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

1. Zinc or cadmium plate steel anchors and other unexposed fasteners after fabrication.
2. Paint dissimilar metals where drainage from them passes over aluminum.
3. Paint aluminum surfaces in contact with mortar, concrete or other masonry with alkali resistant coating.
4. Paint wood and similar absorptive material in contact with aluminum and exposed to the elements or otherwise subject to wetting, with two coats of aluminum house paint. Seal joints between the materials with sealant.

E. Drill and tap frames and doors and apply surface-mounted hardware items. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.

F. Set sill members and other members in bed of sealant as indicated, or with joint fillers or gaskets as indicated to provide weathertight construction. Comply with requirements of Division 7 for sealants, fillers, and gaskets.

G. Refer to "Glass and Glazing" Section of Division 8 for installation of glass and other panels indicated to be glazed into doors and framing, and not preglazed by manufacturer.

3.3 ADJUSTING

A. Adjust operating hardware to function properly, for smooth operation without binding, and for weathertight closure.

3.4 CLEANING

A. Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings.

B. Clean glass surfaces after installation, complying with requirements contained in the "Glass and Glazing" Section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

3.5 PROTECTION

A. Institute protective measures required throughout the remainder of the construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION 084100

SECTION 085200 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes heavy commercial-grade aluminum window units of the performance class indicated. Window types required include:

1. Window units with fixed sash and projected sash. Furnish and factory glaze with 1 inch thick insulating glazing units as specified in Division 8 Section "Glazing".

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide aluminum window units that comply with performance requirements specified, as demonstrated by testing manufacturer's corresponding stock systems according to test methods indicated.

B. Design Requirements: Comply with structural performance, air infiltration, and water penetration requirements indicated in AAMA 101 for type, grade, and performance class of window units required.

1. Design wind velocity at the project site is 80 mph (110 km/h).

C. Testing: Test each type and size of required window unit through a recognized independent testing laboratory or agency, in accordance with ASTM E 330 for structural performance, with ASTM E 283 for air infiltration, and with both ASTM E 331 and ASTM E 547 for water penetration. Provide certified test results.

1. Air Infiltration: Provide units with air infiltration rate of not more than 0.37 cfm/ft. (0.57 L/s x m) of operable sash joint for an inward test pressure of 6.24 lbf/sq. ft. (299 Pa).
2. Water Penetration: Provide units with no water penetration as defined in the test method at an inward test pressure of 15 percent of the design pressure.
3. Condensation Resistance: Where window units are indicated to be of "thermal-break construction," provide units that have been tested for thermal performance in accordance with AAMA 1503.1 showing a condensation resistance factor (CRF) of not less than 54.
4. Thermal Transmittance: Provide window units that have a U-value maximum of 0.56 BTU/h x sq. ft. x deg F (3.9 W/m x K) at 15-mph (24 km/h) exterior wind velocity, when tested in accordance with AAMA 1503.1.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

1. Product data for each type of window required, including:

   a. Construction details and fabrication methods.
   b. Profiles and dimensions of individual components.
   c. Data on hardware, accessories, and finishes.
   d. Recommendations for maintenance and cleaning of exterior surfaces.

2. Shop drawings for each type of window required. Include information not fully detailed in manufacturer's standard product data and the following:

   a. Layout and dimension of existing windows.
   b. Layout and installation details, including anchors.
   c. Elevations of continuous work at 1/4 inch = 1 foot (1:50) scale and typical window unit elevations at 3/4 inch = 1 foot (1:20) scale.
   d. Full-size section details of typical composite members, including reinforcement.
   e. Hardware including operators.
   f. Glazing details.
   g. Accessories.

3. Samples: Submit samples of each specified finish on 6-inch lengths.
4. Certification: Provide certification by a recognized independent testing laboratory or agency showing that each type, grade, and size of window unit complies with performance requirements indicated.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed installation of aluminum windows similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.

B. Standards: Requirements for aluminum windows, terminology and standards of performance, and fabrication workmanship are those specified and recommended in AAMA 101 and applicable general recommendations published by AAMA.

C. Single-Source Responsibility: Provide aluminum window units from one source and produced by a single manufacturer.

D. Design Concept: The drawings indicate the size, profiles, and dimensional requirements of the aluminum window types required and are based on the specific type and model indicated. Aluminum windows by other manufacturers may be considered provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Architect. The burden of proof of equality is on the proposer.

1.6 PROJECT CONDITIONS

A. Field Measurements: Check actual window openings by accurate field measurement before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

1. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit of window units.

1.7 WARRANTY

A. Submit a written warranty, executed by the Contractor, Installer and aluminum window manufacturer, agreeing to repair or replace aluminum window units which fail in materials or workmanship within the specified warranty period. Failures include, but are not necessarily limited to structural failures including excessive deflection, excessive leakage or air infiltration, faulty operation of sash and hardware and deterioration of metals, metal finishes and other materials beyond normal weathering.

B. Warranty Period: 3 years after the date of Substantial Completion.

C. The warranty shall not deprive the Owner of other rights or remedies that the Owner may have under other provisions of the Contract Documents and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Manufacturer’s to match as closely as possible the dimensions, operation and assembly of existing windows. Windows specified are Series 2700 HC thermal, heavy commercial aluminum windows manufactured by EFCO Corporation, Monett, MO. Subject to compliance with requirements, provide products of one of the following:

1. Kawneer
2. Lexcam
3. Winco
4. Custom Window Company

2.2 MATERIALS

A. Windows shall be fabricated of extruded 6063-T5 aluminum alloy aluminum projected, tubular sections, double weatherstripped, with thermal break at entire perimeter of frame units. Both frame and ventilator sections shall be not less than 2" deep, (however, the Contractor shall be responsible for providing all necessary trim required around the window to fully cover any opening at the sill, head and jambs) with ventilator corners neatly joined by electrical flash welding. All walls including tubular members shall have a minimum thickness of .125 inches.

Projected window sash shall have manufacturer's standard cam-action sweep type lever handle locking hardware, Anderberg Series 301 4-bar stainless steel operating arms, snap-in inside aluminum bead glazing strips. Provide specified finish.

B. Fasteners: Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be noncorrosive and compatible with aluminum window members, trim, hardware, anchors, and other components of window units.

1. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125 inch (3.2 mm) thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard noncorrosive pressed-in splined grommet nuts.
2. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For application of hardware, use fasteners that match the finish of the member or hardware being fastened, as appropriate.

C. Anchors, Clips, and Window Accessories: Fabricate anchors, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel or iron complying with the requirements of ASTM B 633; provide sufficient strength to withstand design pressure indicated.

D. Compression-Type Glazing Strips and Weatherstripping: Unless otherwise indicated, and at the manufacturer's option, provide compressible stripping for glazing and weatherstripping such as molded EPDM or neoprene gaskets complying with AAMA SG-1 or with ASTM D 2000 Designation 2BC415 to 3BC620, or molded PVC gaskets complying with ASTM D 2287, or molded expanded EPDM or neoprene gaskets complying with ASTM C 509, Grade 4.

E. Sealant: For sealants required within fabricated window units, provide type recommended by the manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating. Comply with Division 7 Section "Joint Sealants" of these specifications for selection and installation of sealants.

2.3 HARDWARE

A. General: Provide the previously specified manufacturer's standard hardware fabricated from corrosion-resistant material compatible with aluminum and of sufficient strength to perform the function for which it is intended.

2.4 ACCESSORIES

A. General: Provide the manufacturer's standard accessories that comply with indicated standards.

2.5 FABRICATION

A. General: Fabricate aluminum window units to comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.

1. Provide units that are reglazable without dismantling sash or ventilator framing.
2. Prepare window sash or ventilators for glazing except where preglazing at the factory is indicated.

B. Thermal-Break Construction: Fabricate window units with an integral concealed low-conductance thermal barrier, located between exterior materials and window members exposed on the interior, in a manner that eliminates direct metal-to-metal contact.

1. Provide thermal-break construction that has been in use for not less than 3 years, has been tested to demonstrate resistance to thermal conductance and condensation, and has been tested to show adequate strength and security of glass retention.
2. Provide hardware with low conductivity or nonmetallic material for hardware bridging thermal breaks at frame or vent sash.
3. Weepholes: Provide weepholes and internal passages to conduct infiltrating water to the exterior.
4. Subframes: Provide subframes with anchors for window units, where shown, of profile and dimensions indicated but not less than 0.062-inch (1.6-mm) thick extruded aluminum. Miter or cope corners, and weld and dress smooth with concealed mechanical joint fasteners. Finish to match window units.
5. Mullions: Provide mullions and cover plates as shown, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections, in the manner indicated.
6. Glazing Stops: Provide screw-applied or snap-on glazing stops, coordinated with glass selection and glazing system indicated. Finish glazing stops to match window units.

C. Preglazed Fabrication: Preglaze window units at the factory where possible and practical for applications indicated. Comply with glass and glazing requirements of the "Glass and Glazing" sections of these specifications and AAMA 101.

2.6 FINISHES

A. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.

B. Finish designations prefixed by "AA" conform to the system established by the Aluminum Association for designating aluminum finishes.

C. High-Performance Organic Coating: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: chemical conversion coating, acid chromate-fluoride-phosphate pretreatment; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturer's instructions.

1. Fluorocarbon 2-Coat Coating System: Manufacturer's standard 2-coat thermocured system, composed of specially formulated inhibitive primer and fluorocarbon color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; comply with AAMA 605.2.
2. Color and Gloss: Provide color as selected by Architect from manufacturer's standard or custom colors and gloss.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect openings before beginning installation. Verify that rough or masonry opening is correct and the sill plate is level.

1. Masonry surfaces shall be visibly dry and free of excess mortar, sand, and other construction debris.
2. Metal surfaces shall be dry; clean; free of grease, oil, dirt, rust and corrosion, and welding slag; without sharp edges or offsets at joints.

3.2 INSTALLATION

A. Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators, and other components of the work.

B. Set window units plumb, level, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.

1. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with the requirements specified under paragraph "Dissimilar Materials" in the Appendix to AAMA 101.

C. Set sill members and other members in a bed of compound or with joint fillers or gaskets, as shown, to provide weathertight construction. Refer to the "Joint Sealer" sections of Division 7 for compounds, fillers, and gaskets to be installed concurrently with window units. Coordinate installation with wall flashings and other components of the work.

1. Compounds, joint fillers, and gaskets to be installed after installation of window units are specified as work in another section in Division 7.

3.3 ADJUSTING

A. Adjust operating sash and hardware to provide a tight fit at contact points and at weatherstripping for smooth operation and a weathertight closure.

3.4 CLEANING

A. Clean aluminum surfaces promptly after installation of windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.

B. Clean glass of preglazed units promptly after installation of windows. Comply with requirements of the "Glass and Glazing" section for cleaning and maintenance.

3.5 PROTECTION

A. Initiate and maintain protection and other precautions required through the remainder of the construction period, to ensure that, except for normal weathering, window units will be free of damage or deterioration at the time of Substantial Completion.

END OF SECTION 085200

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Commercial door hardware for the following swinging doors:
   a. Hollow metal.
   b. Aluminum
   c. Flush wood.
   d. Existing.
2. **Electrified access control and security monitoring door hardware. See Hardware Set Prefix Key at the beginning of the Door Hardware Schedule and Door-Set Numbering Index (this Section). See electrical specifications for additional electrical work and materials required.**
3. **Required field surveying prior to submittal. See Field Surveying Note at the beginning of the Door Hardware Schedule for special requirements associated with this survey.**

B. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. KENTUCKY BUILDING CODE.

1.3 SUBMITTALS

A. Number of Submittals: All items listed in this section are to be included in one submittal prepared by one Supplier.

B. Product Data: Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

C. Qualification Data:

1. Finish Hardware Installers

a. Finish hardware, including electrified hardware, for wood, hollow metal, and aluminum doors to be installed by personnel trained and certified by the manufacturer of the product furnished.
b. Provide manufacturer's certificates for installer as part of Contractor's bid information. Failure to supply certificates may result in rejection of bid.

2. Hardware Supplier
   a. Established contract hardware firm which maintains and operates an office, display, and stock in project area and which is a factory authorized distributor of the lock being furnished.
   b. Hardware scheduled and furnished by or under direct supervision an Architectural Hardware Consultant.
   c. All schedules submitted to the Architect for approval and job use must carry the signature and certified seal of this Architectural Hardware Consultant.
3. Architectural Hardware Consultant
   a. Currently certified by the Door and Hardware Institute.
   b. Full-time employee of the Hardware Supplier or an individual having no contractual ties to any supplier/manufacturer entity.
   c. Available at reasonable times to Architect, Owner, and Contractor during course of work.

D. Maintenance Data: For each type of door hardware. Include final hardware schedule, keying schedule, riser diagrams, and point-to-point wiring diagrams in 3-ring binder, labeled on spine with project name and "Door Hardware".

E. Warranty: Special warranty specified in this Section.

F. Other Action Submittals:

1. Door Hardware Sets: Prepared by or under the supervision of a DHI certified Architectural Hardware Consultant, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final door hardware sets with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

   a. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule"; other formats will be rejected without review. Double space entries, and number and date each page.
   b. Numerical Sequence of Sets and Headings: Submittal headings shall be in exact order as hardware sets in specification: one heading only per set. Submittal set numbers shall relate to specification set numbers, ie. if three headings are required for Set 12 due to door width differences, then the heading numbers should be 12.1, 12.2, and 12.3 or employing similar linking logic.
   c. Door Numbers: Identical to those used in the contract documents.
   d. Number of Copies: (5).
   e. Content: Include the following information:

      1) Identification number, location, hand, fire rating, and material of each door and frame.
      2) Type, style, function, size, quantity, and finish of each door hardware item.
      3) Complete designations of every item required for each door or opening including name and manufacturer.
      4) Degree of opening for closer and overhead stop and holder installation.
      5) Keying information.
      6) Fastenings and other pertinent information.

7) Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
8) Explanation of abbreviations, symbols, and codes contained in schedule.
9) Mounting locations for door hardware.
10) Notes included with specification hardware sets <u>transcribed verbatim</u> into submittal hardware sets.
11) Door and frame sizes and materials.
12) Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
    a) Sequence of Operation: Include description of component functions that occur in the following situations: authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; unauthorized person wants to exit.
13) List of related door devices specified in other Sections for each door and frame.

f. Submittal Sequence: Submit the final door hardware sets at earliest possible date, particularly where approval of the door hardware sets must precede fabrication of other work that is critical in Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the door hardware sets.

2. **Keying Schedule: In lieu of a keying schedule, provide as part of the hardware submittal a list of doors indicating how many permanent key cylinder cores are required per door.**

1.4 QUALITY ASSURANCE

A. Furnish proper hardware types and quantities for proper door function, hardware mounting and clearances, aesthetics, and to meet applicable codes. Bring discrepancies to the attention of the Architect a minimum of (10) days prior to bid date so that an addendum may be issued and costs included in the bid. No additional compensation will be allowed after bidding for hardware changes required for proper function, hardware mounting or clearances, aesthetics or to meet codes. The specification is not a detail from which products should be ordered; detailing the project is the responsibility of the Contract Hardware Supplier.

B. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

C. Source Limitations: **All items listed in hardware sets are to be furnished by one supplier**. Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

D. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:

1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
2. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
    a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
    b. Door Closers: Comply with the following maximum opening-force requirements indicated:
        1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
        2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
    c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
3. NFPA 101: Comply with the following for means of egress doors:
    a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
    b. Thresholds: Not more than 1/2 inch high.
4. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 (neutral pressure at 40" above sill) or UL-10C.
    a. Test Pressure: Positive pressure labeling.

E. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification related to the final door hardware sets, and include basic installation instructions, templates, and necessary fasteners with each item or package.

1.6 COORDINATION

A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Distribute templates in a timely manner so as not to delay suppliers. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

B. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, access control system, and security system.

C. Existing Openings: Where new hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, contract hardware supplier shall field verify existing conditions and coordinate procurement and installation of door hardware to suit opening conditions, aesthetic matters of form and finish, issues of clearance,

function and fitup with existing door and frame preps, and to provide for proper operation and code compliance.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Seven years for heavy duty cylindrical (bored) locks and latches.
2. Five years for exit hardware.
3. Ten years for manual door closers.
4. Two years for electromechanical and integrated access control door hardware.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Maintenance Service: Beginning at Substantial Completion, provide (6) months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door hardware operation. Provide parts and supplies same as those used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in this and door hardware sets indicated in Part 3 "Door Hardware Sets" Article.

1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.

B. Designations: Requirements for design, grade, function, material, finish, size and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:

1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
2. References to BHMA Standards: In addition to other requirements in this section, provide products complying with or exceeding these standards and requirements for description, quality, and function.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electrified access control door hardware, in compliance with specifications, must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01 "Substitution Procedures". Approval of requests is at the discretion of the architect, owner, and their designated consultants.

D. 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 manufacturers specified.

2.2 BUTT HINGES, GENERAL

A. Quantity: Provide the following, unless otherwise indicated:

1. Two Hinges: For doors with heights up to 60 inches (1524 mm).
2. Three Hinges: For doors with heights 61 to 90 inches (1549 to 2286 mm).
3. Four Hinges: For doors with heights 91 to 120 inches (2311 to 3048 mm).
4. For doors with heights more than 120 inches (3048 mm), provide 4 hinges, plus 1 hinge for every 30 inches (750 mm) of door height greater than 120 inches (3048 mm).

B. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

C. Hinge Height, Width, and Weight: Unless otherwise indicated, provide the following:

1. Doors with Exit Devices or 3’6” or more in width: 5” high, heavy-weight hinges.
2. Doors less than 3’6” in width: 4-1/2” high, standard-weight hinges.
3. Width: 4-1/2” heavy-weight, 4-1/2" standard-weight, unless proper clearance requires a different width.
4. Doors with Closers: Antifriction-bearing hinges.

D. Hinge Base Metal: Unless otherwise indicated, provide the following:

1. Exterior and in-swinging restroom door hinges: Stainless steel, with stainless-steel pin.
2. Balance of hinges: Steel, with steel pin.

E. Hinge Options: Provide the following:

1. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for reverse bevel lockable doors.
2. Corners: Square.

3. Number of knuckles: five.

F. Fasteners: Comply with the following:

1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
2. Wood Screws: For wood doors and frames.
3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
4. Screws: Phillips flat-head. Finish screw heads to match surface of hinges.

G. Template Hinge Dimensions: BHMA A156.7.

H. Available Manufacturers:

1. Ives (IVE).
2. Hager Companies (HAG).
3. McKinney Products Company; an ASSA ABLOY Group company (MCK).
4. Stanley Commercial Hardware; Div. of The Stanley Works (STH).
5. PBB, Inc. (PBB)

2.3 CONTINUOUS HINGES

A. Provide hinge of general series as indicated in hardware sets and of proper shape and model to suit door and frame configuration.

B. Continuous, Pinless-Type Hinges: Extruded-aluminum, pinless, hinge leaves; with concealed, self-lubricating thrust bearings.

1. Available Manufacturers:

a. Hager Companies (HAG).
b. IVES Hardware; an Allegion Company (IVS).
c. McKinney Products Company; an ASSA ABLOY Group company (MCK).
d. Architectural Builders Hardware (ABH).
e. Pemko Manufacturing Co. (PEM).
f. Select Products Limited (SPL).
g. Stanley Commercial Hardware; Div. of The Stanley Works (STH).
h. Zero International (ZRO).

2.4 ELECTRIC STRIKES

A. Surface Mounted Rim Panic Electric Strikes: Surface mounted rim exit device electric strikes conforming to ANSI/BHMA A156.31, Grade 1, and UL Listed for both Burglary Resistance and for use on fire rated door assemblies. Construction includes internally mounted solenoid with two heavy-duty, stainless steel locking mechanisms operating independently to provide tamper resistance. Strikes tested for a minimum of 500,000 operating cycles. Provide strikes with 12V PoE VDC capability supplied standard as fail-secure unless otherwise specified. Option available for latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike. Strike requires no cutting to the jamb prior to installation.

1. Acceptable Manufacturers:

a. HES (HES) - 9500/9600 Series.
b. Security Door Controls (SDC) - 30 Series.

c. Trine (TRN) - 4850 Series.
d. Von Duprin (VON) - 6300 Series.

B. Provide electric strikes with in-line (MOV) surge suppressors.

2.5 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. Pop-in models are ¾" diameter. Mortised models have ANSI frame preps with contact and magnetic housing mortised into the frame and are attached with screws. Surface mounted models are triple-biased, complete with armored flex cabling. All models accommodating up to ½" gap and with DPDT contacts.

1. Acceptable Manufacturers:

a. Architectural Control Systems, Inc. (ACS).
b. George Risk Industries (GRI).
c. Interlogix.
d. Flair Electronics (FLR).

B. Electronic Power Transfers:

1. Concealed: For new doors and frames, concealed when door is closed. All metal construction, cast housing with steel backboxes, two universal joints and rigid tubing. Acceptable Manufacturers:

a. Security Door Controls (SDC).
b. Securitron Door Controls (SEC).
c. Architectural Builders Hardware (ABH).
d. Hager (HAG).
e. Von Duprin (VON).

2. Surface Armored Door Loop: 18" stainless steel, interior diameter of 0.25". Acceptable Manufacturers:

a. Security Door Controls (SDC).
b. Securitron Door Controls (SEC).
c. Alarm Lock (ALR).
d. Keedex (KDX).

C. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies with independent fused outputs for each opening serviced. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

1. Acceptable Manufacturers:

a. Power supplies are to have the same manufacturer of the exit device they are powering.

2.6 LOCKS AND LATCHES, GENERAL

A. Accessibility Requirements: Where indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22 N).

B. Latches and Locks for Means of Egress Doors: Comply with NFPA 101. Latches shall not require more than 15 lbf (67 N) to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

C. Lock Trim:

1. Levers: Cast.
   a. Best 14 model with full smooth return.
2. Roses: Forged.
   a. Best C model.
3. Lockset Designs: Provide design indicated in hardware sets, or, if sets are provided by another manufacturer, provide designs that match those designated.

D. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Bored Locks: Minimum 1/2-inch (13-mm) latchbolt throw.
2. Deadbolts: Minimum 1-inch (25-mm) bolt throw.

E. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.

F. Strikes: Manufacturer's standard strike with strike box for each latchbolt or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, and as follows:

1. Strikes for Bored Locks and Latches: BHMA A156.2.
2. Strikes for Auxiliary Deadlocks: BHMA A156.5.

2.7 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: Function numbers and descriptions indicated in door hardware sets comply with the following:

1. Bored Locks: BHMA A156.2.

B. Bored Locks: BHMA A156.2 Grade 1.

1. Available Manufacturers:

   a. Best Access Systems; Div. of The Stanley Works (BAS).
   b. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (CR).
   c. Schlage Commercial Lock Division; an Allegion Company (SCH).

C. Compatibility with Key Cylinders: fully warranted for use with key cylinder and housing furnished.

2.8 AUXILIARY LOCKS AND LATCHES

A. Auxiliary Locks: BHMA A156.5, Grade 1.

1. Available Manufacturers:

a. Sargent (SAR).
b. Yale (YAL).
c. Best (BES).

2.9 EXIT DEVICES

A. Exit Devices: BHMA A156.3, Grade 1.

B. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22 N).

C. Exit Devices for Means of Egress Doors: Comply with NFPA 101. Exit devices shall not require more than 15 lbf (67 N) to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

D. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305.

E. Fire Exit Devices: Devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.

F. Removable Mullions

1. BHMA A156.3.
2. Key removable.
3. Provide head cap spacers, angle brackets, and other mounting accessories as needed for proper mounting, and anchoring and support of screws, as needed for top jamb configuration.
4. Provide mullion stabilizer sets for mullions at exterior openings.

G. Outside Trim: As specified in hardware sets; material and finish to match locksets, unless otherwise indicated.

1. Match design for locksets and latchsets, unless otherwise indicated.

H. Fasteners. Manufacturer’s standard, except furnish sex bolts for attachments to doors.

I. Shims: Provide shims if needed for clearance.

J. Available Manufacturers:

1. Detex, Inc. (DTX)

2. Precision Hardware, Inc. (PHI).
3. Von Duprin; an Allegion Company (VON).
4. Sargent (SAR).

2.10 KEY CYLINDERS AND HOUSINGS

A. Cylinder Housings: Provide SFIC 7-pin key cylinder housings for all devices requiring key cylinders to properly function: constructed from brass or bronze, stainless steel, or nickel silver. Owner will furnish and install the permanent key cylinder cores. Housings must be warranted for use with Best SFIC 7-pin permanent key cylinder cores.

B. Construction Keying: Comply with the following:

1. Construction Cores: Provide keyed brass construction cores that are replaceable by permanent cores for locking devices. Provide 6 construction master keys.

a. Remove construction cores as directed by Owner.

C. Supplemental Items: Provide cylinder spacers, collars, and correct cams as needed for proper function of locking devices.

D. Available Manufacturers:

1. Best Access Systems; Div. of The Stanley Works (BAS).
2. Corbin Russwin Architectural Hardware; an ASSA ABLOY Group company (CR).
3. Schlage Commercial Lock Division; an Allegion Company (SCH).

2.11 KEYING

A. Keying System: Keying of permanent key cylinder cores is provided by Owner.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

a. Notation: "DO NOT DUPLICATE."

2. Quantity: Provide the following:

a. Construction Control Keys: Two.
b. Construction Keys: Six.

2.12 FIRE DEPARTMENT KEY BOX

A. Provide (1) fully recessed hinged fire department key box.

1. Basis of specification: Knox-Box Model 3200 x RMK x Aluminization x Black.
2. Available Manufacturers:
   a. Knox Company.
   b. Approved equal.

B. Locate in exterior wall as directed by Architect.

2.13 SURFACE CLOSERS

A. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Comply with the following maximum opening-force requirements:

    a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
    b. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

B. Door Closers for Means of Egress Doors: Comply with NFPA 101. Door closers shall not require more than 30 lbf (133 N) to set door in motion and not more than 15 lbf (67 N) to open door to minimum required width.

C. Fasteners: Manufacturer’s standard for arms, shoes and brackets. Sex bolts for fastening closers to doors.

D. Mounting Accessories: Provide shoes, brackets, drop plates, spacers, etc., as needed for proper mounting of closers and arms to door and frame.

E. Spring Size of Units: Provide field-sizable closers, adjustable for spring sizes 1-6, plus 50% extra spring power at spring size 6, to meet field conditions and requirements for opening force.

F. Cylinders: 1-1/2" minimum diameter; cast iron or high-silicon alloy aluminum.

G. Mounting Configuration: Unless otherwise indicated by model number in the hardware sets:

1. Do not furnish closers capable of being mounted on the corridor side of doors.
2. Do not furnish regular arm closers in areas accessible to students.
3. If tri-pack closers are furnished for regular arm applications, remove parallel arm shoe from closer box before delivering to job.
4. Parallel Arm closers are to be manufacturer's double forged rigid models.

H. Available Manufacturers and Series for Rack and Pinion Surface Closers:

1. LCN Closers; an Allegion Company (LCN): 4040XP series.
2. Hager; 5100 series.
3. Sargent (SAR): 281 series.

2.14 PROTECTIVE TRIM UNITS

A. Size:
1. Width
    a. Singles, and pairs with removable mullions or surface applied astragals: 2 inches (38 mm) less than door width on push side and 1 inch (13 mm) less than door width on pull side
    b. Other pairs: 1 inch (13 mm) less than door width
2. Height: as specified in door hardware sets; or, if constrained by door bottom rail height, 1" less bottom rail height.

B. Fasteners: Manufacturer's machine or self-tapping countersunk screws.

C. Metal Protective Trim Units: BHMA A156.6; beveled 4 sides; fabricated from 0.050-inch- (1.3-mm-) thick stainless steel.

D. Available Manufacturers:

1. Hager Companies (HAG).
2. IVES Hardware; an Allegion Company (IVS).
3. Hiawatha (HIW).
4. Burns (BRN).
5. Rockwood Manufacturing Company (RM).
6. Trimco (TBM).

2.15 MECHANICAL WALL STOPS AND HOLDERS

A. Stops and Bumpers: BHMA A156.16, Grade 1.

1. Provide wall stops for doors unless floor, overhead, or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Provide floor stops (and spacers if needed) of proper height and configuration to accommodate floor condition. Where floor or wall stops are not appropriate, provide overhead holders.
2. Properties. Cast construction with fastener suitable for wall or floor condition.
3. Available Manufacturers:
    a. Hager Companies (HAG).
    b. IVES Hardware; an Allegion Company (IVS).
    c. Hiawatha (HIW).
    d. Burns (BRN).
    e. Rockwood Manufacturing Company (RM).
    f. Trimco (TBM).

2.16 SILENCERS

A. Silencers for Metal Door Frames: BHMA A156.16, Grade 1; neoprene or rubber, minimum diameter 1/2 inch (13 mm); fabricated for drilled-in application to frame.

B. Available Manufacturers:

1. Glynn-Johnson; an Allegion Company (GJ).
2. Hager Companies (HAG).
3. IVES Hardware; an Allegion Company (IVS).
4. McKinney Products Company; an ASSA ABLOY Group company (MCK).
5. Rockwood Manufacturing Company (RM).
6. Trimco (TBM).

2.17 DOOR GASKETING

A. General: Provide continuous weather-strip gasketing on exterior hollow metal doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners as indicated by models in hardware sets.

1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame. If hardware is to be attached to the frame and would interfere with the gasketing, then provide hardware compatible gasketing that does not need to be cut for the mounting of hardware.
2. Mullion Gasketing: Fasten to mullions, forming seal when doors are closed.
3. Sweeps: Apply to bottom of in-swinging exterior hollow metal doors, or as required for sound attenuation, forming seal with threshold or floor when door is closed.
4. Seals integral to threshold at out-swinging exterior hollow metal doors.

B. Air Leakage: Not to exceed 0.50 cfm per foot (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.

C. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated, based on testing according to UL 1784.

1. Provide smoke-labeled gasketing on 20-minute-rated doors and on smoke-labeled doors.

D. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 or UBC Standard 7-2.

1. Test Pressure: After 5 minutes into the test, neutral pressure level in furnace shall be established at 40 inches (1016 mm) or less above the sill.

E. Mullion Gasketing: Sealing up to 1/4" gaps, 4 vanes, adhesive backed, collapsible to 1/32", black. Basis of Design: DHSI (DHS) Model MS-SA/75 x BK.

F. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

G. Jamb Gasketing Materials:
1. Adhesive Seals. As specified in hardware sets or approved equal.
2. Intumescents: As required.
3. Screwed-on weatherstrip and sweeps. Neoprene.
4. Panic type thresholds. Neoprene.

H. Available Manufacturers for Jamb Gaskets (provided they provide items with neoprene inserts):

1. Hager Companies (HAG).
2. National Guard Products (NGP).
3. Pemko Manufacturing Co. (PEM).
4. Reese Enterprises (REE).
5. Zero International (ZER).

2.18 THRESHOLDS

A. Standard: BHMA A156.21

B. Accessibility Requirements: Where thresholds are indicated to comply with accessibility requirements, comply with the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

1. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.

C. Thresholds for Means of Egress Doors: Comply with NFPA 101. Maximum 1/2 inch (13 mm) high.

D. Fasteners: ¼-20 machine screws and expansion anchors.

E. Gasketing material: At panic-type thresholds: neoprene.

F. Available Manufacturers (provided they provide items with neoprene inserts):

1. Hager Companies (HAG).
2. National Guard Products (NGP).
3. Pemko Manufacturing Co. (PEM).
4. Reese Enterprises (RE).
5. Zero International (ZRO).

2.19 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

2.20 FINISHES

A. Standard: BHMA A156.18, as indicated in door hardware sets.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

3.2 PREPARATION

A. Steel Doors and Frames: Comply with DHI A115 Series.

1. Surface-Applied Door Hardware: Drill and tap doors and frames according to ANSI A250.6.

B. Wood Doors: Comply with DHI A115-W Series.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated as follows unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."

B. Mounting Locations:

1. Floor Stops and Holders: Locate at least 20" out from hinge edge of door for maximum degree of opening before door encounters obstruction.
2. Wall Stops: Locate so that lockset spindle and wall stop share horizontal and vertical centerlines.
3. **Closers and Overhead Stop/Holders: Template and mount closers and overhead stops for maximum degree of opening before door encounters obstruction or so as to interface with specified wall stops and holders. When used with closers, template and locate overhead stops so that closer arm does not fully extend and bottom out. These functionality requirements override any degree of opening information in the specifications or submittals.**

C. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

D. Boxed Power Supplies: Locate power supplies as directed by Architect.

E. **Weatherstrip and Gasketing with Metal Retainers: Fit up as needed for neat appearance with no gaps between retainers or bulbs.**

F. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants." **Position for complete seal with bottom of doors with no penetration of air or daylight.**

3.4 FIELD QUALITY CONTROL

A. Provide Door Hardware Inspection Services and Field Quality Report as indicated below.

B. Door Hardware Inspection Services

1. Scope
   a. Inspection of all swinging doors and door hardware immediately following completion of installation.
   b. Inspector to furnish a Field Quality Report, itemized per each individual opening, to the Architect within 7 days of the inspection, including:
      1) deficiencies in workmanship and standard industry practices,
      2) use of allowable products,
      3) use of manufacturer recommended fasteners,
      4) compliance with the ADA,
      5) proper door/frame/hardware clearances,
      6) problems related to function, security, aesthetics or maintenance.
2. Inspector Qualifications
      1) Certified Architectural Hardware Consultant.
      2) Entirely independent of the supply side of the project, having no familial or financial relationship with any manufacturer, manufacturer's representative, distributor, installer or supplier used on this project.
      3) Approved by Architect. Go to http://www.dhi.org/ for searchable list of local Architectural Hardware Consultants.
      4) Full member in good standing of Specification Consultants in Independent Practice (SCIP).
      5) Same Inspector for re-inspections as for the initial inspection.
3. Payment for the inspection and subsequent re-inspections until work is complete and approved is to be made directly by the Hardware Supplier to the Inspector within 30 days of receipt of report and invoice.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

B. Overhead Stops/Holders: Set adjustable stops for maximum degree of opening before door encounters obstruction. Adjust friction to control door.

C. Door Closers:

1. Unless otherwise required by authorities having jurisdiction, adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.
2. Adjust latch period so that door does not slam nor injure fingers.
3. Adjust spring power so that door properly latches.
4. Adjust backcheck to slow door down before hitting stop point so as to prevent damage to closer, arm, door, frame, and fasteners.

D. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer shall examine and readjust, including adjusting operating forces, each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DOOR HARDWARE SCHEDULE (followed by Door-Set Index)

HARDWARE SET PREFIX KEY:

C Card Reader

D Door position switch(s) (door contacts) required.

E Electrified items but no card reader or security monitoring.

P Power Supply at opening, requires 115VAC, 1A service by electrical subcontractor, located in concealed, readily accessible space near opening as directed by Architect. If "P" is not in the set prefix then the low voltage power is provided by the Access Control Vendor.

No prefix indicates no electrified items.

EXPOSED HOLES IN DOORS NOTE:

Where holes in doors created by the removal of hardware are not covered by the new hardware, fill and finish those holes to match adjacent substrates.

KEY CYLINDER CORE NOTE:

Where possible, salvage and re-utilize existing cores for new hardware on the same opening.

FIELD SURVEYING NOTE:
Field Surveying IS Required for Supplier to Detail the Proper Products. Model numbers for hinges, latch retraction kits, power supplies, etc. are included to get the Supplier close for bidding purposes, but the Supplier is responsible for field surveying and then detailing all products for compatibility with existing conditions and full system functionality.

Hardware Set CD01 – Door A101

Non-electrified Items:

(3)	Butt Hinge	BB1168 x 5 x 4.5	652	HAG
(1)	Panic Device, Rim, 03, CD	2103CD x 2003C	630	PHI
(1)	Rim Cylinder Housing	7-pin, SFIC	626	BES
(1)	Mortise Cylinder Housing	7-pin, SFIC	626	BES
(2)	Permanent Cylinder Core	By Owner	626	BES
(1)	Closer, w/Spring Stop	4040XP SCUSH	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI

Electrified Items:

(1)	PoE Rim Panic Electric Strike	4850 Enhanced	630	TRN

(1) Lot: Card Reader (single-gang), control electronics, low voltage cabling, terminations: all by Access Control Vendor.
(1) Lot: Video-intercom w/Integral Remote Release Pushbutton System: see electrical specifications.
(1) Lot: Electrical rough-ins: see electrical drawings.

System Function:

Free egress. Ingress by card or key or by pushbutton integral to video-intercom system. Doors are monitored for door position.

Hardware Set CDP01 – Door E02

Non-electrified Items:

(1)	Continuous Hinge, ALF/ALD	SL11HD	628	SEL
(1)	Key Removable Mullion	KR-822 x ST989 x MCS822	689	PHI
(2)	Rim Cylinder Housing	7-pin, SFIC	626	BES
(2)	Permanent Cylinder Core	By Owner	626	BES
(2)	Closer, w/Spring Stop	4040XP SCUSH x 4040-30 x 4040-61	689	LCN
(1)	Cat H Adhesive Mullion Seal/Mute	MS-SA/75	BRN	DHS
(1)	Lot: Jamb and meeting edge seals by aluminum door and frame supplier.			
(1)	Panic Threshold	896N x RCE	628	NGP

Note 1: 3/8" door undercut required for proper mating of door bottom with seal integral to threshold.

Electrified Items:

(1)	Continuous Hinge, ALF/ALD	SL11HD x EPT Prep	628	SEL
(1)	Jamb-to-Door Power Transfer	EPT-12C	630	PHI
(1)	Panic Device, Rim, 01, LD	2401LD	630	PHI
(1)	Panic Device, Rim, 03, LD	MLR2403LD x 2003C	630	PHI
(1)	Power Supply, 24VDC, 2A	RPSMLR2		PHI
(2)	Door Contact, ¾", Pop-in, DPDT	195-12	Gray	GRI

(1) Lot: Card Reader (single-gang), control electronics, low voltage cabling, terminations: all by Access Control Vendor.
(1) Lot: Video-intercom w/Integral Remote Release Pushbutton System: see electrical specifications.
(1) Lot: Electrical rough-ins: see electrical drawings.

System Function:

Free egress. Ingress by card or key or by pushbutton integral to video-intercom system. Doors are monitored for door position.

Hardware Set CDP01A – Doors E04, E05

Non-electrified Items:

(1)	Key Removable Mullion	KR-822 x ST989 x MCS822	689	PHI
(2)	Rim Cylinder Housing	7-pin, SFIC	626	BES
(2)	Permanent Cylinder Core	By Owner	626	BES
(2)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Cat H Adhesive Mullion Seal/Mute	MS-SA/75	BRN	DHS
(1)	Cat H Jamb Seal Set	135NA	628	NGP

Electrified Items:

(1)	Jamb-to-Door Power Transfer	EPT-12C	630	PHI
(1)	Panic Device, Rim, 01, LD	2101LD	630	PHI
(1)	Panic Device, Rim, 03, LD	MLR2103LD x 2003C	630	PHI
(1)	Power Supply, 24VDC, 2A	RPSMLR2		PHI
(2)	Door Contact, Surface, TB, DPDT	GR2707-AD	628	GRI

(1) Lot: Card Reader (single-gang), control electronics, low voltage cabling, terminations: all by Access Control Vendor.

(1) Lot: Video-intercom w/Integral Remote Release Pushbutton System: see electrical specifications.

(1) Lot: Electrical rough-ins: see electrical drawings.

System Function:

Free egress. Ingress by card or key or by pushbutton integral to video-intercom system. Doors are monitored for door position.

Salvage/Retrofit Note:

Hardware Supplier to field survey prior to submittal to properly detail opening for fit, function, appearance and clearance issues. Remove existing mullion and fittings (if they exist), panic devices, closers, pulls, kick plates and weather seals; replace with new. Adjust existing hinges for proper door/frame clearances and function. Wet wipe clean existing door, frame, hardware and threshold.

Hardware Set CDP02 – Door E03

Non-electrified Items:

(1)	Key Removable Mullion	KR-822 x ST989 x MCS822	689	PHI
(2)	Rim Cylinder Housing	7-pin, SFIC	626	BES
(2)	Permanent Cylinder Core	By Owner	626	BES
(2)	Closer, w/Spring Stop	4040XP SCUSH	689	LCN
	Note: Provide closer drop plates as required.			
(2)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Cat H Adhesive Mullion Seal/Mute	MS-SA/75	BRN	DHS
(1)	Cat H Jamb Seal Set	135NA	628	NGP

Electrified Items:

(1)	Surface Armored Door Loop	K-DLA	628	KDX
(1)	Panic Device, Rim, 01, LD	2101LD	630	PHI
(1)	Panic Device, Rim, 03, LD	MLR2103LD	630	PHI
(1)	Power Supply, 24VDC, 2A	RPSMLR2		PHI
(2)	Door Contact, Surface, TB, DPDT	GR2707-AD	628	GRI

(1) Lot: Card Reader (single-gang), control electronics, low voltage cabling, terminations: all by Access Control Vendor.

(1) Lot: Electrical rough-ins: see electrical drawings.

System Function:

Free egress. Ingress by card or key. Doors are monitored for door position.

Salvage/Retrofit Note:

Hardware Supplier to field survey prior to submittal to properly detail opening for fit, function, appearance and clearance issues and provide properly sized hardware accordingly. Remove existing mullion and fittings (if they exist), panic devices, closers, pulls, kick plates and weather seals; replace with new. Adjust existing hinges for proper door/frame clearances and function. Wet wipe clean existing door, frame, hardware and threshold.

Hardware Set D01 – Door E01

Non-electrified Items:

(3)	Butt Hinge	BB1191 x 4.5 x 4.5	630	HAG
(1)	Panic Device, Rim, 01, LD	2101LD	630	PHI
(1)	Closer, w/Spring Stop	4040XP SCUSH	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Cat H Jamb Seal Set	135NA	628	NGP
(1)	Panic Threshold	896N x RCE	628	NGP

Note 1: 3/8" door undercut required for proper mating of door bottom with seal integral to threshold.

Electrified Items:

(1)	Door Contact, ¾", Pop-in, DPDT	195-12	Gray	GRI

(1) Lot: Monitoring electronics, low voltage power and cabling, terminations: all by Access Control Vendor.

(1) Lot: Electrical rough-ins: see electrical drawings.

System Function:

Free egress. No ingress. Door is monitored for door position.

Hardware Set 01 – Door A111

(6)	Butt Hinge	BB1168 x 5 x 4.5	652	HAG
(1)	Panic Device, SVR, 03, CD	LBR2203CD x 4903D	630	PHI
(1)	Panic Device, SVR, 02, CD	LBR2202CD x 4902D	630	PHI
(1)	Rim Cylinder Housing	7-pin, SFIC	626	BES
(2)	Mortise Cylinder Housing	7-pin, SFIC	626	BES
(3)	Permanent Cylinder Core	By Owner	626	BES
(2)	Rim Cylinder Housing	7-pin, SFIC	626	BES
(2)	Permanent Cylinder Core	By Owner	626	BES
(2)	Closer, w/Spring Stop/HO	4040XP SHCUSH	689	LCN
(2)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(2)	Mop Plate	KM050 4 x 1LDW x CS x B4E	630	TRI
(1)	Cat H Astragal Seal Set	(2)172NA	628	NGP
(1)	Cat H Jamb Seal Set	135NA	628	NGP

Hardware Set 02 – Door A102

(3)	Butt Hinge	BB1279 x 4.5 x 4.5	652	HAG
(1)	Office Lock	93K7AB14C-LC-S3	626	BES
(1)	Permanent Cylinder Core	By Owner	626	BES
(1)	Universal Stop, 1-1/2"	7280	630	TRI

Hardware Set 03 – Door A103

(3)	Butt Hinge	BB1168 x 5 x 4.5	652	HAG
(1)	Fire Exit Device, Rim, 10	FL2110VI x 4908D	630	PHI
(1)	Rim Cylinder Housing	7-pin, SFIC	626	BES
(1)	Rim Thumbturn Cylinder	7-pin, SFIC	626	BES
(1)	Permanent Cylinder Core	By Owner	626	BES
(1)	Closer, w/Spring Stop	4040XP SCUSH	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Mop Plate	KM050 4 x 1LDW x CS x B4E	630	TRI
(1)	Cat H Jamb Seal Set	135NA	628	NGP

Hardware Set 04 – Doors A104, A105

(3)	Butt Hinge	BB1191 x 4.5 x 4.5	630	HAG
(1)	Privacy Set	93K0L14C-LC-S3	626	BES
(1)	Closer, Regular Arm	4040XP Reg	689	LCN
(1)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(1)	Mop Plate	KM050 4 x 1LDW x CS x B4E	630	TRI
(1)	Wall Stop, Concave	1270CV	626	TRI

Salvage/Retrofit Note:

Hardware Supplier to field survey prior to submittal to properly detail opening for fit, function, appearance and clearance issues and provide properly sized hardware accordingly.

Hardware Set 05 – Door A106

(6)	Butt Hinge	BB1168 x 5 x 4.5	652	HAG
(2)	Dummy Panic Bar w/Pull Trim	671DR x 2002C	630	PHI
(2)	Kick Plate	KO050 8 x 2LDW x CS x B4E	630	TRI
(2)	Mop Plate	KM050 4 x 1LDW x CS x B4E	630	TRI
(1)	Cat H Astragal Seal Set	(2)172NA	628	NGP
(1)	Cat H Jamb Seal Set	135NA	628	NGP

3.8 DOOR-SET INDEX

Door	HW Set
E01	D01
E02	CDP01
E03	CDP02
E04	CDP01A
E05	CDP01A
A101	CD01
A102	02
A103	03
A104	04
A105	04
A106	05
A111	01

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes glazing for the following products, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Storefront units
2. Window units.
3. Vision lites.
4. Entrances and other doors.

B. Related Sections: The following sections contain requirements that relate to this Section.

1. Standard steel doors and frames elsewhere in Division 8.
2. Aluminum windows.
3. Flush wood doors.

1.3 DEFINITIONS

A. Manufacturer is used in this Section to refer to a firm that produces primary glass or fabricated glass as defined in the referenced glazing standard.

B. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use due to causes other than glass breakage and improper practices for maintaining, and cleaning insulating glass. Evidence of failure is the obstruction of vision by dust, moisture, or film on the interior surfaces of glass. Improper practices for maintaining and cleaning glass do not comply with the manufacturer's directions.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems that are produced, fabricated, and installed to withstand normal thermal movement, wind loading, and impact loading (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; and other defects in construction.

B. Glass Design: Glass thicknesses indicated on Drawings are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for the various size openings in the thicknesses and strengths (annealed or heat-treated) to meet or exceed the following criteria:

1. Minimum glass thickness, nominally, of lites in exterior walls is 6 mm.
2. Tinted and heat-absorbing glass thicknesses for each tint indicated are the same throughout Project.
3. Minimum glass thicknesses of lites, whether composed of annealed or heat-treated glass, are selected so the worst-case probability of failure does not exceed the following:

a. 8 lites per 1000 for lites set vertically or not over 15 degrees off vertical and under

wind action. Determine minimum thickness of monolithic annealed glass according to ASTM E 1300. For other than monolithic annealed glass, determine thickness per glass manufacturer's standard method of analysis including applying adjustment factors to ASTM E 1300 based on type of glass.

b. 1 lite per 1000 for lites set over 15 degrees off vertical and under action of wind or snow load.

C. Normal thermal movement results from the following maximum change (range) in ambient and surface temperatures acting on glass-framing members and glazing components. Base engineering calculation on materials' actual surface temperatures due to both solar heat gain and nighttime sky heat loss.

1. Temperature Change (Range): 120 F deg (67 C deg), ambient; 180 F deg (100 C deg), material surfaces.

1.5 SUBMITTALS

A. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

B. Product data for each glass product and glazing material indicated.

C. Samples for verification purposes of 12-inch (300 mm) square samples of each type of glass indicated except for clear monolithic glass products, and 12-inch (300 mm) long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of material representative in color of the adjoining framing system.

D. Product certificates signed by glazing materials manufacturers certifying that their products comply with specified requirements.

1. Separate certifications are not required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program of a recognized certification agency or independent testing agency acceptable to authorities having jurisdiction.

E. Compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealants. Include sealant manufacturer's interpretation of test results relative to sealant performance and recommendations for primers and substrate preparation needed for adhesion.

F. Compatibility test report from manufacturer of insulating glass edge sealant indicating that glass edge sealants were tested for compatibility with other glazing materials including sealants, glazing tape, gaskets, setting blocks, and edge blocks.

G. Product test reports for each type of glazing sealant and gasket indicated, evidencing compliance with requirements specified.

H. Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.

1.6 QUALITY ASSURANCE

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, except where more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. FGMA Publications: "FGMA Glazing Manual."
2. SIGMA Publications: TM-3000 "Vertical Glazing Guidelines".

B. Safety Glass: Products complying with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.

1. Subject to compliance with requirements, provide safety glass permanently marked with certification label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.

C. Fire-Resistive Glazing Products for Door Assemblies: Products identical to those tested per ASTM E 152, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

D. Fire-Resistive Glazing Products for Window Assemblies: Products identical to those tested per ASTM E 163, labeled and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

E. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of inspecting and testing agency indicated below:

1. Insulating Glass Certification Council (IGCC).

F. Glazier Qualifications: Engage an experienced glazier who has completed glazing similar in material, design, and extent to that indicated for Project with a record of successful in-service performance.

G. Single-Source Responsibility for Glass: Obtain glass from one source for each product indicated below:

1. Primary glass of each (ASTM C 1036) type and class indicated.
2. Heat-treated glass of each (ASTM C 1048) condition indicated.
3. Insulating glass of each construction indicated.

H. Single-Source Responsibility for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

I. Preconstruction Compatibility and Adhesion Testing: Submit to sealant manufacturers, samples of each glass, gasket, glazing accessory, and glass-framing member that will contact or affect glazing sealants for compatibility and adhesion testing as indicated below:

1. Use test methods standard with sealant manufacturer to determine if priming and other specific preparation techniques are required for rapid, optimum glazing sealants adhesion to glass and glazing channel substrates.

a. Perform tests under normal environmental conditions during installation.

2. Submit not less than nine pieces of each type and finish of glass-framing members and each type, class, kind, condition, and form of glass (monolithic, laminated, insulating units) for adhesion testing, as well as one sample of each glazing accessory (gaskets, setting blocks and spacers) for compatibility testing.
3. Schedule sufficient time to test and analyze results to prevent delay in the Work.
3. Investigate materials failing compatibility or adhesion tests and get sealant manufacturer's written recommendations for corrective measures, including using special primers.
4. Testing is not required when glazing sealant manufacturer can submit required preparation data that is acceptable to Architect and is based on previous testing of current sealant products for adhesion to and compatibility with submitted glazing materials.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials to comply with manufacturer's directions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1. Where insulating glass units will be exposed to substantial altitude changes, comply with insulating glass fabricator's recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing materials manufacturer or when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.9 WARRANTY

A. General: Warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

B. Manufacturer's Warranty on Insulating Glass: Submit written warranty signed by manufacturer of insulating glass agreeing to furnish replacements for insulating glass units that deteriorate as defined in "Definitions" article, f.o.b. point of manufacture, freight allowed Project site, within specified warranty period indicated below. Warranty covers only deterioration due to normal conditions of use and not to handling, installing, protecting, and maintaining practices contrary to glass manufacturer's published instructions.

1. Warranty Period: Manufacturer's standard but not less than 10 years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products specified in Product Data Sheets at end of this Section.

2.2 PRIMARY FLOAT GLASS PRODUCTS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Class as indicated below, and Quality q3 (glazing select).

1. Class 1 (clear) unless otherwise indicated.
2. Class 2 (tinted, heat absorbing, and light reducing) where indicated.

B. Refer to Primary Clear Float Glass Product Data Sheet for Class 1 uncoated tinted glass for monolighic glazing.

C. Refer to requirements for sealed insulating glass units for performance characteristics of assembled units composed of tinted glass, coated or uncoated, relative to visible light transmittance, U-values, shading coefficient, and visible reflectance.

2.3 HEAT-TREATED FLOAT GLASS PRODUCTS, GENERAL

A. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.

2.4 HEAT-TREATED FLOAT GLASS

A. Uncoated, Clear, Heat-Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1, Quality q3 (glazing select), kind as indicated below.

1. Kind FT (fully tempered) where indicated and required by Kentucky Building Code.
2. Kind HS (heat strengthened) where indicated.

B. Uncoated, Tinted, Heat-Treated Float Glass: ASTM C 1048, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 2 (tinted heat-absorbing and light-reducing), Quality q3 (glazing select), with tint color and performance characteristics for 6 mm thick glass matching those indicated for annealed primary tinted float glass; kind as indicated below:

1. Kind FT (fully tempered) where indicated and required by Kentucky Building Code.
2. Kind HS (heat strengthened) where indicated.

C. Manufacturers: Subject to compliance with requirements, provide heat-treated glass by one of the following companies.

1. AFG Industries, Inc.
2. Artistic Glass Products Co.
3. Cardinal IG.
4. Saint-Gobain.
5. Falconer Glass Industries.
6. Glasstemp, Inc.
7. Guardian Industries Corp.
8. HGP Industries.
9. PPG Industries, Inc.
10. Spectrum Glass Products, Inc.
11. Tempglass.
12. Viracon, Inc.

2.5 INSULATING GLASS PRODUCTS (at Doors and Storefronts at Discovery Hub at Elementary School)

A. Sealed Insulating Glass Units: Preassembled units consisting of organically sealed lites of

glass separated by dehydrated air spaces complying with ASTM E 774 and with other requirements indicated, including those in Insulating Glass Product Data Sheet at the end of this Section.

12. For properties of individual glass lites making up units, refer to requirements specified elsewhere in this Section applicable to types, classes, kinds, and conditions of glass products comprising lites of insulating glass units.
13. Provide heat-treated, coated float glass of kind indicated Kind FT (fully tempered) where safety glass is designated or required.
14. Performance characteristics designated for coated insulating glass are nominal values based on manufacturer's published test data for units with lites 6 mm thick and nominal 1/2-inch (13 mm) dehydrated space between lites, unless otherwise indicated.
15. U-values are expressed as Btu/hr x sq. ft. x deg F (W/sq. m x K).
5. Units shall be tinted. Color selected by Architect.

2.6 ELASTOMERIC GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
2. Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation.
3. Colors: Provide color of exposed joint sealants to comply with the following:

    a. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

B. Elastomeric Glazing Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with ASTM C 920 requirements indicated on each Elastomeric Glazing Sealant Product Data Sheet at the end of this Section, including those referencing ASTM classifications for Type, Grade, Class and Uses.

1. Additional Movement Capability: Where additional movement capability is specified in Elastomeric Glazing Sealant Product Data Sheet, provide products, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, with the capability to withstand the specified percentage change in the joint width existing at time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.

C. Glazing Sealant for Fire-Resistant Glazing Products: Identical to product used in test assembly to obtain fire-resistive rating.

2.7 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent, nonstaining and nonmigrating in contact with nonporous surfaces, with or without spacer rod as recommended by tape and glass manufacturers for application indicated, packaged on rolls with a release paper backing, and complying with AAMA 800 for products indicated below:

1. AAMA 804.1.

B. Expanded Cellular Glazing Tape: Closed-cell, polyvinyl chloride foam tape, factory coated with adhesive on both surfaces, packaged on rolls with release liner protecting adhesive, and complying with AAMA 800 for product 810.5.

C. Products: Subject to compliance with requirements, provide one of the following:

1. Back-Bedding Mastic Glazing Tape Without Spacer Rod:

a. PTI 303 Glazing Tape (shimless), Protective Treatments, Inc.
b. S-M 5700 Poly-Glaze Tape Sealant, Schnee-Morehead, Inc.
c. Tremco 440 Tape, Tremco Inc.
d. Extru-Seal, Pecora Corp.
e. PTI 606 Architectural Sealant Tape, Protective Treatments, Inc.

2. Back-Bedding Mastic Glazing Tape With Spacer Rod:

a. PTI 303 Glazing Tape (with shim), Protective Treatments, Inc.
b. Pre-shimmed Tremco 440 Tape, Tremco, Inc.
c. PTI 606 Architectural Sealant Tape, Protective Treatments, Inc.

3. Expanded Cellular Glazing Tape:

a. Norseal V-980 Closed-Cell Glazing Tape, Norton Company.

2.8 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:

1. Neoprene, ASTM C 864.

B. Soft Compression Gaskets: Extruded or molded closed-cell, integral-skinned gaskets of material indicated below, complying with ASTM C 509, Type II, black, and of profile and hardness required to maintain watertight seal:

1. Neoprene.
2. EPDM.
3. Silicone.
4. Thermoplastic polyolefin rubber.
5. Any material indicated above provided material is compatible with glazing sealant being used.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following companies.

1. Preformed Gaskets:

a. Advanced Elastomer Systems, L.P.
b. Schnee-Morehead, Inc.
c. Tremco, Inc.

2.9 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 involved for

glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers and Sealers: Type 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. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonextruding, nonoutgassing, strips of closed-cell plastic foam of density, size, and shape to control sealant depth and otherwise contribute to produce optimum sealant performance.

2.10 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 recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine glass framing, with glazier present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Do not proceed with glazing until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass from edge damage during handling and installation as follows:

1. Use a rolling block in rotating glass units to prevent damage to glass corners. Do not

impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass lites with flares or bevels on bottom horizontal edges so edges are located at top of opening, unless otherwise indicated by manufacturer's label.

2. Remove damaged glass from Project site and legally dispose of off site. Damaged glass is glass with edge damage or other imperfections that, when installed, weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass sizes larger than 50 united inches (1250 mm) (length plus height) as follows:

1. Locate spacers inside, outside, and directly opposite each other. Install correct size and spacing to preserve required face clearances, except where gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and comply with system performance requirements.
2. Provide 1/8-inch (3 mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking to comply with requirements of referenced glazing publications, unless otherwise required by glass manufacturer.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that when compressed by glass their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously but not in one continuous length. Do not stretch tapes to make them fit opening.

C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until just before each lite is installed.

F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

3.5 GASKET GLAZING (DRY)

A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.

B. Secure compression gaskets in place with joints located at corners to compress gaskets producing a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

C. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel weep systems until sealants cure. Secure spacers in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass. Install pressurized gaskets to protrude slightly out of channel to eliminate dirt and moisture pockets.

3.7 PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

E. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

PRIMARY TINTED FLOAT GLASS PRODUCT DATA SHEET

A. Primary Tinted Float Glass Designation: Provide at exterior wall locations where aluminum storefront system and aluminum window units are indicated.

B. Class: Class 2 tinted heat-absorbing and light-reducing float glass of tint color as selected by

Owner / Architect, quality q3 (glazing select).

B. Provide products by one of the manufacturers listed below:

1. AFG Industries, Inc.
2. Ford Glass Division.
3. LOF Glass, Inc.
4. PPG Industries, Inc.
5. Saint-Gobain/Euroglass.
6. Guardian Industries Corp.

INSULATING GLASS PRODUCT DATA SHEET

A. Classification of Units: Per ASTM E 774.

B. Air Space Width: Nominal 1/2 inch (12 mm) measured perpendicularly from surfaces of glass lites at unit's edge.

C. Sealing System: Dual seal, primary and secondary sealants: polyisobutylene and silicone.

D. Spacer Specifications: Aluminum with mill or clear-anodized finish.

1. Desiccant: Either molecular sieve or silica gel or blend of both.
2. Corner Construction: Manufacturer's standard corner construction.

E. Glass Specifications: Comply with the following requirements:

1. Thickness of Each Lite: 0.25 inch.
2. Indoor Lite: Kind FT (fully tempered) or Class 1 float glass as indicated.

F. Refer to clear float glass product data sheet for acceptable manufacturers of insulating units.

END OF SECTION 088000

SECTION 089500 – SAFETY & SECURITY WINDOW ASSEMBLY FILM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Optically clear glass shatter and abrasion resistant film applied to interior glass surfaces.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.
2. Section 088000 "Glazing" for new glass.

1.3 ACTION SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

1. Include construction details, material descriptions, dimensions of individual components accessory items.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For safety & security window assembly film to include in maintenance manuals.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS, GENERAL

A. Source Limitations: Obtain safety & security window assembly film from single source from single manufacturer.

2.2 SAFETY & SECURITY WINDOW ASSEMBLY FILM

A. Safety & Security Window Assembly Film: System of film and constraining perimeter adhesive.

1. Manufacturers: Subject to compliance with requirements, provide 3M Scotchshield Safety or equal and security window assembly film (Basis of Design).

2.3 MATERIALS, GENERAL

A. Film Material: The film material shall consist of an optically clear polyester film, consisting of co-extruded microlayers, with a durable acrylic abrasion resistant coating over one surface, and a UV stabilized pressure sensitive adhesive on the other. The film color is clear and will not contain dyed polyester. The film shall have a nominal thickness of 8 mils (0.008 inches), total construction with adhesive of 9mils (0.009 inches). There shall be no evidence of coating voids.

2.4 FILM PROPERTIES

a.) Tensile Strength (ASTM D882):
Coated Film: 33,000 psi (MD) / 30,000 psi (TD)
b.) Break Strength (ASTM D882):
Coated Film: 265 lb/in (MD) / 240 lb/in (TD)
c.) Percent Elongation at Break (ASTM 1)882):
Coated Film: 140 % (MD) / 130% (TD)
d.) Yield Strength:
Coated Film: 15,000 psi (MD)
e.) Percent Elongation at Yield (ASTM D882):
Coated Film: 8% (MD)
f.) Graves Tear Resistance (ASTM D1004):
Maximum Force (lbs):
Coated Film: 37 (MD) / 37 (TD)
Maximum Extension (in):
Coated Film: 0.50 (MD) / O.51 (TD)
Graves Area Tear Resistance (lbs%):
Coated Film: 1,100 (MD) / 1,050 (TD)
g.) Puncture Propagation Tear Resistance (ASTM D2582):
Coated Film: 10 lbf (MD) / 12 (TD)
h.) Puncture Strength (ASTM D4830): Coated Film: 183 bf.

A. Solar Performance Properties: film applied to 1/4" thick clear glass
a.) Visible Light Transmission (ASTM E 903): 88%
b.) Visible Reflection (ASTM E 903): not more than 10%
c.) Ultraviolet Transmission (ASTM E 903): less than 1% (300-380 nm)
d.) Solar Heat Gain Coefficient (ASTM E

B. Flammability: Upon request from Authorized Dealer/Applicator, 3M shall provide independent test data showing that the window film shall meet the requirements of a Class A Interior Finish for Building Materials for both Flame Spread Index and Smoked Development Values per ASTM E-84.
   a.) Flame spread Index (FDI): 5
   b.) Smoke Developed Index (SDI): 25

C. Abrasion Resistance: Upon request from Authorized Dealer/Applicator, 3M shall provide test data showing that the film shall have a surface coating that is resistant to abrasion such that, less than 5% increase of transmitted light haze will result in accordance with ASTM D-1044 using 100 cycles, 500 grams weight, and the CSIOF Calibrase Wheel.

D. Adhesion to Glass: Upon request from Authorized Dealer/Applicator, 3M shall provide test data showing that the film shall have a 180-degree peel strength (adhesion to glass) according to ASTM D-1044 of 6 lbs/in (typical).

E. Adhesive System: The film shall be supplied with a high mass pressure sensitive weatherable acrylate adhesive applied uniformly over the surface opposite the abrasion resistant coated surface. The adhesive shall be pressure sensitive (not water activated) and physically bond (not chemically bond) to the glass. The adhesive shall be essentially optically flat and shall meet the following criteria:

   a.) Viewing the film from a distance of ten feet at angles up to 45 degrees from either side of the glass, the film itself shall not appear distorted.

   b.) It shall not be necessary to seal around the edges of the applied film system with a lacquer or other substance in order to prevent moisture or free water from penetrating under the film system.

F. Impact Protection: Manufacturer shall provide independent test data showing the following:

   a.) Film shall pass impact of Large Missile "C" and withstand subsequent pressure cycling (per ASTMs El 996 and El 886) at +1- 75 psf Design Pressure with use of 3M Impact Protection Adhesive attachment system..

PART 3 – EXECUTION

3.1 APPLICATION

A. Examination: Examine glass surfaces to receive new film and verify that they are free from defects and imperfections, which will affect the final appearance. Correct all such deficiencies before starting film application.

B. Preparation:

   a. The window and window framing will be cleaned thoroughly with a neutral cleaning solution. The inside surface of the window glass shall be scraped with stainless steel razor blades withclean, sharp edges to ensure the removal of any foreign contaminants without damages the glass surface.

   b. Drop cloths or other absorbent material shall be placed on the windowsill or sash to absorb moisture accumulation generated by the film application.

3.2 INSTALLATION: The film shall be applied as to the specifications of 3M by an ADA.

a. Materials will be delivered to the job site with the manufacturer's labels intact and legible.

b. To minimize waste, the film may be cut to specification utilizing a vertical dispenser designed for that purpose. Film edges shall be cut neatly and square at a uniform distance of 1/8" (3 mm) to 1/16" (1.6 mm) of the window-sealing device.

c. Film shall be wet-applied using clean water and slip solution to facilitate positioning of the film onto glass.

d. To ensure efficient removal of excess water from the underside of the film and to maximize bonding of the pressure sensitive adhesive, plastic bladed squeegees shall be used.

e. Upon completion, the film may have a dimpled appearance from residual moisture. Said moisture shall, under reasonable weather conditions, dry flat with no moisture dimples within a period of 30 calendar days when viewed under normal viewing conditions.

f. After installation, any leftover material will be removed, and the work area will be returned to original condition. Use all necessary means to protect the film before, during and after the installation.

3.3 CLEANING

a. The film may be washed using common window cleaning solutions, including ammonia solutions, 30 days after application. Abrasive type cleaning agents and bristle brushes, which could scratch the film, must not be used. Synthetic sponges or soft cloths are recommended.

3.4 WARRANTY

a. Warrants the film for a period of 14 years from the date of installation against cracking, crazing, delaminating, peeling, or discoloration. If the product is found to be defective under warranty, manufacturer will replace such quantity of the film proved to be defective and will additionally provide the removal and reapplication labor free of charge at current industry labor rates.

b, Manufacturer also warrants against glass failure due to thermal shock fracture of the glass window unit (maximum value $500 per window) provided the film is applied to recommended types of glass and the failure occurs within sixty (60) months from the date of application. Any glass failure must be reviewed and approved by 3M prior to replacement and payment.

END OF SECTION 089950

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Non-load-bearing steel framing systems for interior gypsum board assemblies.

B. Related Requirements:

1. Section 092900 "Gypsum Board"

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For fire-resistance-rated assemblies that incorporate non-load-bearing steel framing, provide materials and construction identical to those tested in assembly indicated, according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, 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.

2.2 FRAMING SYSTEMS

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.

B. Studs and Runners: ASTM C 645. Use either steel studs and runners or dimpled steel studs and runners.

1. Steel Studs and Runners:

a. Minimum Base-Metal Thickness: 0.033 inch (0.84 mm).
b. Depth: As indicated on Drawings.

2. Dimpled Steel Studs and Runners:

a. Minimum Base-Metal Thickness: 0.025 inch (0.64 mm).
b. Depth: As indicated on Drawings.

C. Slip-Type Head Joints: Where indicated, provide the following:

1. 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. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

1) Blazeframe Industries; Bare Slotted Track (BST/BST 2).
2) Fire Trak Corp.
3) Metal-Lite; The System.

D. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base-Metal Thickness: 0.018 inch (0.45 mm).
2. Depth: 7/8 inch (22.2 mm).

2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

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

3.2 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

1. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.3 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

C. Install bracing at terminations in assemblies.

D. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

3.4 INSTALLING FRAMED ASSEMBLIES

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

1. Single-Layer Application: 16 inches (406 mm) o.c. unless otherwise indicated.
2. Tile Backing Panels: 16 inches (406 mm) o.c. unless otherwise indicated.

B. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall.

C. Install studs so flanges within framing system point in same direction.

D. 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 cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch (13-mm) clearance from jamb stud to allow for installation of control joint in finished assembly.

3. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure.
4. Sound-Rated Partitions: Install framing to comply with sound-rated assembly indicated.

E. 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.

F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

END OF SECTION 092216

SECTION 09265 - GYPSUM BOARD SHAFT-WALL ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Horizontal enclosure (at laundry room).

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 for definitions of terms for gypsum board construction not defined in this Section or in other referenced standards.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance:

1. Provide gypsum board shaft-wall assemblies for horizontal duct enclosures capable of spanning distances indicated within deflection limits indicated.

1.5 SUBMITTALS

A. Product Data: For each gypsum board shaft-wall assembly indicated and provide 1 hour rated horizontal assembly.

B. Research/Evaluation Reports: Evidence of compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction that substantiate required fire-resistance rating for each gypsum board shaft-wall assembly.

1.6 QUALITY ASSURANCE

A. Fire-Resistance-Rated Assemblies: Provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance-Rated Assemblies: Indicated by design designations from UL's "Fire Resistance Directory."

B. Delegated design: submit calculations, shop drawings and testing data that confirms design and rating compliance stamped and signed by a Kentucky licensed professional Engineer.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Management and Coordination." Review methods and procedures for installing work related to gypsum board shaft-wall assemblies including, but not limited to, the following:

1. Fasteners proposed for anchoring steel framing to building structure.
2. Items supported by shaft-wall-assembly framing.
3. Mechanical work enclosed within shaft-wall assemblies.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, and bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat on leveled supports off the ground to prevent sagging.

1.8 PROJECT CONDITIONS

A. Comply with requirements for environmental conditions, room temperatures, and ventilation specified in Division 9 Section “Gypsum Board Assemblies."

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. American Gypsum Co.
2. G-P Gypsum Corp.
3. National Gypsum Company.
4. United States Gypsum Co.

2.2 ASSEMBLY MATERIALS

A. General: Provide materials and components complying with requirements of fire-resistance-rated assemblies indicated.

1. Provide panels in maximum lengths available to eliminate or minimize end-to-end butt joints.
2. Provide auxiliary materials complying with gypsum board shaft-wall assembly manufacturer's written recommendations.

B. Steel Framing: ASTM C 645.

1. Protective Coating: Manufacturer's standard corrosion-resistant zinc coating.

C. Gypsum Liner Panels: Manufacturer's proprietary liner panels in 1-inch (25.4-mm) thickness and with moisture-resistant paper faces.

D. Gypsum Wallboard: ASTM C 36, core type as required by fire-resistance-rated assembly indicated.

1. Edges: Tapered and featured (rounded or beveled) for prefilling.

E. Gypsum Base for Gypsum Veneer Plaster: ASTM C 588, core type as required by fire-resistance-rated assembly indicated, with edges as standard with manufacturer.

F. Accessories: Cornerbead, edge trim, and control joints of material and shapes specified in Division 9 Section “Gypsum Board Assemblies" that comply with gypsum board shaft-wall assembly manufacturer's written recommendations for application indicated.

G. Gypsum Wallboard Joint-Treatment Materials: ASTM C 475 and as specified in Division 9 Section "Gypsum Board Assemblies."

H. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

I. Track (Runner) Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft-wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.

1. Powder-Actuated Fasteners: Provide powder-actuated fasteners with capability to sustain, without failure, a load equal to 10 times that imposed by shaft-wall assemblies, as determined by testing conducted by a qualified independent testing agency according to ASTM E 1190.

J. Sound Attenuation Blankets: ASTM C 665 for Type I, unfaced mineral-fiber-blanket insulation produced by combining thermosetting resins with mineral fibers manufactured from slag or rock wool.

2.3 GYPSUM BOARD SHAFT WALL

A. Deflection Limit: L/360

B. Studs: Manufacturer's standard profile for repetitive members and corner and end members and for fire-resistance-rated assembly indicated.

1. Depth: 2-1/2 inches (63.5 mm).
2. Minimum Base Metal Thickness: Manufacturer's standard thicknesses that comply with structural performance requirements for stud depth indicated.

C. Track (Runner): Manufacturer's standard J-profile track with long-leg length as standard with manufacturer, but at least 2 inches (51 mm), in depth matching studs.

1. Minimum Base Metal Thickness: Manufacturer's standard thicknesses that comply with structural performance requirements for stud depth indicated.

D. Jamb Struts: Manufacturer's standard J-profile strut with long-leg length of 3 inches (76.2 mm), in depth matching studs, and not less than 0.0329 (0.84 mm) thick.

E. Room-Side Finish: Gypsum board.

F. Cavity Insulation: Sound attenuation blankets.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board shaft-wall assemblies attach or abut, with Installer present, including hollow-metal frames, elevator hoistway door frames, cast-in anchors, and structural framing. Examine for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and the following:

1. ASTM C 754 for installing steel framing.
2. Division 9 Section "Gypsum Board Assemblies" for applying and finishing panels.

B. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.

C. Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly. Install acoustical sealant to withstand dislocation by air-pressure differential between shaft and external spaces; maintain an airtight and smoke-tight seal; and comply with manufacturer's written instructions or ASTM C 919, whichever is more stringent.

1. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at 24 inches (610 mm) o.c. with screws fastened to shaft-wall framing.
2. Where steel framing is required to support gypsum board cants, install framing at 24 inches (610 mm) o.c. and extend studs from the projection to the shaft-wall framing.

END OF SECTION 09265

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board.

B. Related Requirements:

1. Section 092216 "Non-Structural Metal Framing" for non-structural framing and suspension systems that support gypsum board panels.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, 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.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. American Gypsum
2. CertainTeed Corporation
3. Georgia-Pacific Building Products
4. National Gypsum Company
5. United States Gypsum Company

B. Gypsum Wallboard: ASTM C 1396/C 1396M.

1. Thickness: 5/8 inch (15.9 mm).
2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

C. Moisture- and Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces. (Within all restrooms and lounge / workroom)

1. Core: 5/8 inch (15.9 mm), Type X.
2. Long Edges: Tapered.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:

a. Cornerbead.
b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. L-Bead: L-shaped; exposed long flange receives joint compound.
d. Expansion (control) joint.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Fry Reglet Corporation.
b. Gordon, Inc.
c. Pittcon Industries.

2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.

a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use drying-type, all-purpose compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.
5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

D. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Grabber Construction Products; Acoustical Sealant GSC.
b. Specified Technologies, Inc; Smoke N Sound Acoustical Sealant.
c. United States Gypsum Company; SHEETROCK Acoustical Sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

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

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch-(6.4- to 9.5-mm-)wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch-(6.4- to 12.7-mm-)wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

I. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: As indicated on Drawings.
2. Type X: As indicated on Drawings.
3. Ceiling Type: As indicated on Drawings.
4. Abuse-Resistant Type: As indicated on Drawings.
5. Moisture- and Mold-Resistant Type: As indicated on Drawings.
6. Type C: Where required for specific fire-resistance-rated assembly indicated.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
2. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing) unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

    a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
    b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners.

2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated.

C. Aluminum Trim: Install in locations indicated on Drawings.

3.5 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 2: Panels that are substrate for tile.
3. Level 5: At all occupiable locations, unless noted otherwise on drawings..

    a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."

3.6 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092900

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for ceilings.

B. Related Requirements:

1. Section 092900 “Gypsum Board”

C. Products furnished, but not installed under this Section, include anchors, clips, and other ceiling attachment devices to be cast in concrete.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Panels: Full-size panels equal to 2 percent of quantity installed.
2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension-system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
2. Smoke-Developed Index: 450 or less.

2.2 ACOUSTICAL PANELS, GENERAL

A. Source Limitations:

1. Acoustical Ceiling Panel: Obtain each type from single source from single manufacturer.
2. Suspension System: Obtain each type from single source from single manufacturer.

B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system from single source from single manufacturer.

C. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.

D. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances unless otherwise indicated.

1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface according to ASTM E 795.

E. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 ACOUSTICAL PANELS TYPE ACT-1

A. Basis-of-Design Product: Subject to compliance with requirements, match existing (assumed “Armstrong: School Zone – Fine Fissured.” or comparable product by one of the following):

1. Armstrong World Industries, Inc.
2. Chicago Metallic Corporation.
3. United States Gypsum Company.

B. Classification: Provide panels complying with ASTM E 1264 for type, form, and pattern as follows:

1. Type and Form: Type III, mineral base with painted finish; Form 2, water felted.

C. Color: White.

D. LR: Not less than 0.80.

E. NRC: Not less than 0.90

F. CAC: Not less than 35.

G. Edge/Joint Detail: Non-Tegular Edge.

H. Thickness: 3/4 inch (15 mm).

I. Modular Size: 24 by 24 inches (610 by 610 mm).

2.4 ACOUSTICAL PANELS – TYPE ACT-2

A. Panel Characteristics: Vinyl clad gypsum board. Gypsum board with sealed edges, formulated especially for ceiling application in humid or exterior environments.

1. Modular Size: 24 by 24 inches
2. Thickness: 5/8 inch
3. Finish: Unperforated vinyl film.
4. Color: White
5. Light Reflectance Coefficient: Not less than 0.75
6. CAC: Not less than 40
7. Products with properties specified, which are comparable in appearance to the following, will be considered:

a. Series: Match existing (assumed to be Armstrong Ceramaguard panels laminated vinyl surface, or approved equal).

2.5 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension-System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635/C 635M.

B. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

1. Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing according to ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.

    a. Type: Postinstalled expansion anchors.

2. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing according to ASTM E 1190, conducted by a qualified testing and inspecting agency.

C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.

D. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

E. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

F. Seismic Clips: Manufacturer's standard seismic clips designed and spaced to secure acoustical panels in place.

2.6 METAL SUSPENSION SYSTEM – (ACT 1 AND ACT 3)

A. Basis-of-Design Product: Subject to compliance with requirements, match existing (assumed Armstrong "Prelude ML 15/16" or comparable product by one of the following):

1. Armstrong World Industries, Inc.
2. Chicago Metallic Corporation; 200 Snap Grid.
3. United States Gypsum Company.

B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation; with prefinished 15/16-inch-(24-mm-)wide metal caps on flanges.

1. End Condition of Cross Runners: butt-edge type.
2. Face Design: Flat, flush.
3. Cap Material: Steel cold-rolled sheet.
4. Cap Finish: Painted white.

2.7 METAL SUSPENSION SYSTEM – (ACT-1 AND ACT-3)

A. Basis-of-Design Product: Subject to compliance with requirements, match existing (assumed to be Armstrong “Prelude ML 15/16”) or comparable product by one of the following:

1. Armstrong World Industries, Inc.
2. Chicago Metallic Corporation; 200 Snap Grid.

3. United States Gypsum Company.

B. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation; with prefinished 15/16-inch-(24-mm-) wide metal caps on flanges.

1. End Condition of Cross Runners: butt-edge type.
2. Face Design: Flat, flush.
3. Cap Material: Steel cold-rolled sheet.
4. Cap Finish: Painted white.

2.8 METAL SUSPENSION SYSTEM – (BOTH ACT-1 AND ACT-2)

A. Exposed Grid: Provide non-rust type with other characteristics same as specified for the preceding lay-in acoustical ceiling system.

1. Basis-of-Design: USG Donn ZXLA Suspension System.

2. Provide aluminum grid cup at all exposed areas.

2.9 METAL EDGE MOLDINGS AND TRIM

A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Armstrong World Industries, Inc.
2. Chicago Metallic Corporation.
3. United States Gypsum Company.

B. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension-system runners.

1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners unless otherwise indicated.
2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

2.10 ACOUSTICAL SEALANT

A. Acoustical Sealant: Manufacturer's standard sealant complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

1. Acoustical sealant shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

B. Examine acoustical panels before installation. Reject acoustical panels that are wet, moisture damaged, or mold damaged.

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

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636/C 636M and seismic design requirements indicated, according to manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
7. Do not attach hangers to steel deck tabs.
8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
9. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches (200 mm) from ends of each member.
10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
2. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
3. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 101423 - PANEL SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Panel signs.
2. Room-identification signs.

B. Related Requirements:

1.3 DEFINITIONS

A. Accessible: In accordance with the accessibility standard.

1.4 COORDINATION

A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For panel signs.

1. Include fabrication and installation details and attachments to other work.
2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.

C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.

1. Include representative Samples of available typestyles and graphic symbols.

D. Sign Schedule: Use same designations specified or indicated on Drawings or in a sign schedule.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For signs to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.8 FIELD CONDITIONS

A. Field Measurements: Verify locations of anchorage devices and electrical service embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Deterioration of finishes beyond normal weathering.
b. Deterioration of embedded graphic image.
c. Separation or delamination of sheet materials and components.

2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

B. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for signs.

2.2 SIGNS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Best Sign Systems, Inc.
2. Mohawk Sign Systems, Inc.
3. Seton Identification Products
4. ASI Sign Systems, Inc.
5. Contemporary Plastics, Inc.
6. Johnson Signs, Inc.
7. Fast Signs
8. Mills Manufacturing

9. Innerface
10. Dura Architectural Signage
11. Nelson Harkins
12. Cornerstone Signs
13. Signs International, Inc.
14. American Graphics, Inc.

B. Panel Sign.: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:

1. Basis-of-Design Product: Match existing (assumed to be ASI InTac).
2. Solid-Sheet Sign, Returns, and Back: Acrylic sheet with finish specified in "Surface Finish and Applied Graphics" Subparagraph below and as follows:

    a. Thickness: 0.125 inch (3.18 mm).
    b. Surface-Applied Graphics: Raised 1/32". text and graphics.

        1) Text: Font Helvetica Regular to meet ADA requirements.
        2) Inset, Cutout Characters: Sign face routed to receive push-through acrylic graphics to project 1/32" from the sign panel.

    c. Etched and Filled Graphics: Sign face etched or routed to receive enamel-paint infill.
    d. Mounting: Concealed fasteners and adhesive unless noted otherwise on drawings.

3. Mounting: Surface mounted to wall with concealed anchors.
4. Surface Finish and Applied Graphics:

    a. Baked-Enamel or Powder-Coat Finish and Graphics: Manufacturer's standard, in color as selected by Architect from manufacturer's full range.
    b. Overcoat: Manufacturer's standard baked-on clear coating.

5. Text and Typeface: Accessible raised characters and Braille and Helvetica Regular. Finish raised characters to contrast with background color, and finish Braille to match background color.
6. Flatness Tolerance: Sign panel shall remain flat or uniformly curved under installed conditions as indicated and within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner.

2.3 PANEL-SIGN MATERIALS

A. Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

B. Vinyl Film: UV-resistant vinyl film of nominal thickness indicated, with pressure-sensitive, permanent adhesive on back; die cut to form characters or images as indicated and suitable for exterior applications.

C. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.

2.4 ACCESSORIES

A. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:

1. Use concealed fasteners and anchors unless indicated to be exposed.
2. Sign Mounting Fasteners:

    a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.

3. Inserts: Furnish inserts to be set by other trades into concrete or masonry work.

2.5 FABRICATION

A. General: Provide manufacturer's standard sign assemblies to match existing according to requirements indicated.

1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
5. Internally brace signs for stability and for securing fasteners.
6. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

B. Subsurface-Applied Graphics: Apply graphics to back face of clear face-sheet material to produce precisely formed image. Image shall be free of rough edges.

C. Subsurface-Engraved Graphics: Reverse engrave back face of clear face-sheet material. Fill resulting copy with manufacturer's standard enamel. Apply opaque manufacturer's standard background color coating over enamel-filled copy.

D. Shop- and Subsurface-Applied Vinyl: Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fishmouths.

E. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:

1. For snap-in changeable inserts beneath removable face sheet, furnish one suction or other device to assist in removing face sheet. Furnish initial changeable insert. Furnish two blank inserts for each sign for Owner's use.
2. For slide-in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert. Furnish two blank inserts for each sign for Owner's use.

3. For frame to hold changeable sign panel, fabricate frame without burrs or constrictions that inhibit function. Furnish initial sign panel. Subsequent changeable sign panels are by Owner.

2.6 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.

D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.

B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

C. Verify that anchor inserts are correctly sized and located to accommodate signs.

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

3.2 INSTALLATION

A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
2. Install signs so they do not protrude or obstruct according to the accessibility standard.
3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

B. Room-Identification Signs and Other Accessible Signage: Install in locations on walls according to accessibility standard.

C. Mounting Methods:

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

    a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.
    b. Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

2. Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.

3.3 ADJUSTING AND CLEANING

A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.

B. Remove temporary protective coverings and strippable films as signs are installed.

C. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by Owner.

END OF SECTION 101423

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.
2. Private-use bathroom accessories.
3. Custodial accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Features that will be included for Project.
5. Manufacturer's warranty.

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.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

B. 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.

1.6 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.

D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.

E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AJW Architectural Products
2. American Specialties, Inc.
3. Bobrick Washroom Equipment, Inc.
4. Bradley Corporation
5. GAMCO Specialty Accessories

B. Combination Towel (Roll) Dispenser/Waste Receptacle.:

1. Basis-of-Design Product: Refer to Toilet Accessory Schedule in Drawings.
2. Description: Combination unit for dispensing preset length of roll paper towels, with removable waste receptacle.
3. Mounting: Surface mounted.

4. Minimum Towel-Dispenser Capacity: 8-inch-(203-mm-)wide, 800-foot-(244-m-)long roll.
5. Minimum Waste Receptacle Capacity: 8 gal. (30 L).
6. Material and Finish: Stainless steel, No. 4 finish (satin).
7. Liner: Reusable, vinyl waste-receptacle liner.
8. Lockset: Tumbler type for towel dispenser compartment and waste receptacle.

C. Grab Bar.:

1. Basis-of-Design Product: Refer to Toilet Accessory Schedule in Drawings..
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch (1.3 mm) thick.

    a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.

4. Outside Diameter: 1-1/4 inches (32 mm).
5. Configuration and Length: As indicated on Drawings.

D. Mirror Unit.:

1. Basis-of-Design Product: Refer to Toilet Accessory Schedule in Drawings..
2. Frame: Stainless-steel angle, 0.05 inch (1.3 mm) thick.

    a. Corners: Welded and ground smooth.

3. Integral Shelf: 5 inches (127 mm) deep.
4. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.

    a. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
    b. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.

5. Size: As indicated on Drawings.

2.3 PRIVATE-USE BATHROOM ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Soap Dish.:

1. Basis-of-Design Product: Refer to Toilet Accessory Schedule in Drawings.
2. Mounting: Surface mounted.
3. Material and Finish: Stainless steel, No. 4 finish (satin).

2.4 HAND DRYERS

A. Basis-of-Design Product: Dyson Airblade V. Finish as selected by Owner.

2.5 CUSTODIAL ACCESSORIES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Mop and Broom Holder.:

1. Basis-of-Design Product: Refer to Toilet Accessory Schedule in Drawings.
2. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
3. Length: 36 inches (914 mm).
4. Hooks: 5.
5. Mop/Broom Holders: Four, spring-loaded, rubber hat, cam type.
6. Material and Finish: Stainless steel, No.4 finish (satin).

    a. Shelf: Not less than nominal 0.05-inch-(1.3-mm-)thick stainless steel.
    b. Rod: Approximately 1/4-inch-(6-mm-) diameter stainless steel.

2.6 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

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.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

SECTION 104400 - FIRE-PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Portable fire extinguishers.
2. Fire-protection cabinets for fire extinguishers.
3. Fire-protection accessories.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection specialties.

1. Fire Extinguishers: Include rating and classification.
2. Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

B. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of cabinet finish indicated.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain fire extinguishers and cabinets through one source from a single manufacturer.

B. NFPA Compliance: Fabricate, label and install fire extinguishers to comply with NFPA 10, "Standard for Portable Fire Extinguishers."

C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide extinguishers listed and labeled by FM.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following.

1. Portable Fire Extinguishers:

a. Larsen's Manufacturing Company.
b. Modern Metal Products; Div. of Technico.

2. Fire-Protection Cabinets:

a. J.L. Industries, Inc.
b. Larsen's Manufacturing Company.
c. Modern Metal Products; Div. of Technico.

B. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Fire-Protection Cabinet Schedule at the end of Part 3.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: Carbon steel, complying with ASTM A 366/A 366M, commercial quality, stretcher leveled, temper rolled.

B. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:

1. Sheet: ASTM B 209 (ASTM B 209M).
2. Extruded Shapes: ASTM B 221 (ASTM B 221M).

C. Stainless-Steel Sheet: ASTM A 666/A 666M, Type 302 or Type 304 alloy.

2.3 PORTABLE FIRE EXTINGUISHERS

A. General: Provide fire extinguishers of type, size, and capacity for each cabinet and other locations indicated.

B. Multipurpose Dry-Chemical Type: UL-rated 4-A:60-B:C, 10-lb (4.5-kg) nominal capacity, in enameled-steel container.

C. Wet-Chemical Type: UL-rated 1-A:1-B:C:K, nominal capacity, in stainless-steel container: with pressure-indicating gage. To be provided in Kitchen only.

2.4 FIRE-PROTECTION CABINETS

A. Cabinet Construction: 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. Miter and weld perimeter door frames. Provide fire rated cabinet construction at all rated wall locations.

B. Cabinet Type: Suitable for the following:

1. Fire extinguisher.

C. Cabinet Mounting: Suitable for the following mounting conditions:

1. Semirecessed: Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated. Adjust recess and trim as required for wall thickness.

D. Cabinet Trim Style: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

1. Exposed Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).

a. Square-Edge Trim: 1-1/4- to 1-1/2-inch (32- to 38-mm) backbend depth.

E. Cabinet Trim Material: Manufacturer's standard, as follows:

1. Same metal and finish as door.

F. Door Material: Manufacturer's standard, as follows:

1. Steel sheet.

G. Door Glazing: Manufacturer's standard, as follows:

1. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3:

a. Class 1 (clear).

H. Door Style: Manufacturer's standard design, as follows:

1. Fully glazed panel with frame.

I. Door Construction: Fabricate doors according to manufacturer's standards, of materials indicated, and coordinated with cabinet types and trim styles selected.

1. Provide minimum 1/2-inch- (13-mm-) thick door frames, fabricated with tubular stiles and rails, and hollow-metal design.

J. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide exposed or concealed door pull and friction latch. Provide concealed or continuous-type hinge permitting door to open 180 degrees. Provide lock with two (2) keys.

2.5 ACCESSORIES

A. Mounting Brackets: Manufacturer's standard steel, designed to secure extinguisher, of sizes required for types and capacities of extinguishers indicated, with plated or baked-enamel finish.

1. Provide brackets for extinguishers not located in cabinets.
2. Provide brackets for extinguishers located in cabinets.

B. Identification: Provide lettering to comply with authorities having jurisdiction for letter style, color, size, spacing, and location. Locate as indicated by Architect.

1. Identify bracket-mounted extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to wall surface.
2. Identify fire extinguisher in cabinet with the words "FIRE EXTINGUISHER" applied to door.

a. Application Process: Silk-screened.
b. Application Process: Vinyl letters.
c. Lettering Color: Red.
d. Orientation: Vertical.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Cabinet and Door Finishes: Provide manufacturer's standard baked-enamel paint for:

1. Exterior of cabinets and doors, except for those surfaces indicated to receive another finish.
2. Interior of cabinets and doors.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls and partitions for suitable framing depth and blocking where recessed and semirecessed cabinets are to be installed.

B. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged units.

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

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing fire-protection specialties.

B. Install in locations and at mounting heights indicated to comply with applicable regulation of NFPAIO.

1. Prepare recesses for cabinets as required by type and size of cabinet and trim style.
2. Fasten mounting brackets to structure and cabinets, square and plumb.
3. Fasten cabinets to structure, square and plumb.
4. Mount fire extinguisher on bracket, top of extinguisher 54” above finished floor.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust cabinet doors that do not swing or operate freely.

B. Refinish or replace cabinets and doors damaged during installation.

C. Provide final protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 10440

SECTION 105300 - ALUMINUM PROTECTIVE CANOPIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

A. Extent of work includes all labor, material, equipment and related items required for the installation of "Aluminum Protective Canopies" as shown on the drawings and specified herein.

1.3 QUALITY ASSURANCE:

A. Materials and finishes shall meet or exceed recommended ASTM, Military and Federal Test methods specified by the Aluminum Association in their publication "Aluminum Standards and Data, current edition.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's product data and installation instructions for each type of canopy specified.

B. Samples for Initial Color Selection: Manufacturer’s color charts showing a full range of available colors.

C. Samples for Color Verification: Sample showing actual colors prepared on same material to be used for the work.

B. Shop Drawings: Submit shop drawings for components and installation which are fully dimensioned or detailed on manufacturer's data sheets.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Subject to compliance with requirements, provide products of one of the following or approved equal:

1. Tennessee Valley Materials, Inc. (Basis-of-Design)
2. Alcan Aluminum Canopies
3. Mapes Industries, Inc.

2.2 CONSTRUCTION:

A. Canopy: Decking shall be .062” minimum walled aluminum with a three-inch minimum rib height, flush deck. Fascia gutter shall be a structural 8” minimum .125” walled extruded tube. Two-piece fascia shall not be accepted. Overhead supports shall be a heavy-duty extruded prefinished aluminum tube strut supports. Galvanized steel struts will not be accepted. Columns to be integral downspouts that connect to subsurface storm piping. Provide galvanized metal strainers at the highest end of all downspouts. Finish shall be factory applied 70% by weight Kynar resin in a custom color as selected by owner. Provide continuous flashing system at canopy to existing masonry wall construction.

2.3 PROTECTIVE COATING:

A. All ferrous fasteners and hanging accessories shall be heavily galvanized or cadmium plated. All louvers, gutters and fascia to be caustic etched and alumilited.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install canopies at locations shown in accordance with enlarged details and manufacturer's instructions for plumb, level, rigid and flush installation.

END OF SECTION 105300

SECTION 11 17 00

TRANSACTION WINDOWS WITH DEAL TRAYS

1. GENERAL

1.1. SUMMARY

A. Section Includes:
   1. Transaction windows with deal trays and shelves.

B. Related Sections:
   1. Section 092550 - Gypsum Board Assemblies: Partition construction

1.2. REFERENCES

A. American Architectural Manufacturers Association:
   1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.

B. ASTM International:
   1. ASTM A27/A27M - Standard Specification for Steel Castings, Carbon, for General Application.
   2. ASTM A 36/A 36M. - Standard Specification for Carbon Structural Steel.
   3. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings.
   4. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   5. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   6. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
   7. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   8. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
   9. ASTM B221/B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
   10. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
   11. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
   12. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics.
   13. ASTM E488 - Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements.
   14. ASTM E699 - Standard Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components.

15. ASTM F2329 - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

C. Consumer Products Safety Commission:
1. CPSC 16 CFR 1201 - Safety Standard for Architectural Glazing.

A. Ballistics-Resistance Performance: Provide units identical to those tested for compliance with requirements indicated, and as follows:
1. Listed and labeled as bullet resisting according to UL 752.
2. Tested for ballistics resistance according to UL 752 by a testing agency acceptable to authorities having jurisdiction.

1.2. SUBMITTALS

A. Section 01 33 00 - Submittal Procedures {01330 - Submittal Procedures}: Requirements for submittals.

B. Shop Drawings:
1. Indicate configuration, sizes, rough-in, mounting, construction and glazing details as well as installation clearances and finishes.

C. Product Data:
1. Submit manufacturer's product data for specified Products indicating materials, operation characteristics, and finishes.

D. Samples:
1. Submit two samples, 4 x 4 inches (100 x 100 mm) in size illustrating metal finishes for each finish specified.

E. Test Reports:
1. [Indicate compliance with specified bullet resistance performance.]

F. Manufacturer's Installation Instructions:
1. Submit installation instructions with requirements to accommodate specific site conditions.

1.2. QUALITY ASSURANCE

A. Products Requiring Electrical Connection: Listed and classified by UL or testing firm acceptable to authority having jurisdiction.

1.3. QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum 10 years documented experience.
1. Participates in a Quality Assurance validation Program.

a. Facility Audit.

B. Installer: Company specializing in installation of window systems specified with minimum three years documented experience.

C. Testing Agency Qualifications:
1. Qualified according to ASTM E699 and experienced in [ballistics-] [and] [forced-entry-] resistance testing.

1.4. DELIVERY, STORAGE, AND PROTECTION

A. Section 01 60 00 - Product Requirements {01600 - Product Requirements}: Requirements for transporting, handling, storing, and protecting products.

B. Ordering: To avoid construction delays comply with ordering instructions and lead time requirements as set by window system manufacturer.

C. Pack units in manufacturer's standard shipping containers and protective packaging. Deliver units in manufacturer's original packaging and unopened containers with identification labels intact.

D. Store units and accessories on raised blocks to prevent moisture damage protected from exposure to weather and vandalism.

1.5. FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication and record on shop drawings.

1.6. COORDINATION

A. Section 01 30 00 - Administrative Requirements {01300 - Administrative Requirements}: Requirements for coordination.

B. Coordinate work with adjacent materials specified in other Sections and as indicated on Drawings and approved shop drawings.

1.7. WARRANTY

A. Furnish manufacturer's standard warranty document, executed by an authorized Quikserv Corp. officer in which manufacturer agrees to repair or replace windows, drawers and air curtains that fail in materials or workmanship within specified warranty period. This warranty is in addition to, and not a limitation of other rights Owner has under the contract.
1. Warranty Period:
a. One year parts and labor from date of installation.
2. Failures include, but are not limited to, the following:
a. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
b. Structural failures including deflections exceeding 1/4 inch.
c. Failure of welds.

d. Excessive air leakage.
e. Faulty operation of transaction drawers.

2. PRODUCTS

2.1. MATERIALS

A. Aluminum Extrusions: ASTM B221/B221M. Provide alloy and temper recommended by manufacturer for strength, corrosion resistance, and application of required finish, but not less than 22,000-psi (150-MPa) ultimate tensile strength and not less than 0.125 inch (3.2 mm) thick at any location for main frame and sash members.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Stainless-Steel Sheet, Strip, Plate, and Flat Bars:
1. ASTM A666, austenitic stainless steel, Type 304, stretcher-leveled standard of flatness.
2. ASME SA-240/SA-240M, chromium and chromium-nickel stainless steel plate, sheet, and strip for general applications.

D. Concealed Bolts: ASTM A307, Grade A unless otherwise indicated.

E. Embedded Plate Anchors: Fabricated from steel shapes and plates, minimum 3/16 inch (4.8 mm) thick; with minimum 1/2-inch- (12.7-mm-) diameter, headed studs welded to back of plate..

F. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

G. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30-mil (0.76-mm) thickness per coat.

H. Sealants: For sealants required within fabricated security windows, provide type recommended by manufacturer for joint size and movement. Sealant shall remain permanently elastic, nonshrinking, and nonmigrating.

I. Gaskets: For gaskets required within fabricated Pizza Drawer Window units, provide type recommended by manufacturer for joint size and movement. Gaskets shall remain permanently elastic, nonshrinking, and nonmigrating.

2.2. GLASS COMPONENTS

A. Comply with requirements of UL listing for ballistics-resistance levels as specified.

B. Bullet Resistant Glazing:
1. Model QSBR - Sheet:
a. LEXGARD® MP750 Level 1 - 9mm or .38 Special caliber rated.

C. Miscellaneous Glazing Materials: Provide material, size, and shape complying with requirements of glass manufacturers, and with a proven record of compatibility with surfaces contacted in installation:
   1. Cleaners, Primers, and Sealers: Type recommended by sealant or gasket manufacturer.
   2. Setting Blocks: Elastomeric material with a Type A Shore durometer hardness of 85, plus or minus 5.
   3. Spacers: Elastomeric blocks or continuous extrusions with a Type A Shore durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
   4. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

D. Anchors, Clips, and Window Accessories: Manufacturers standards stainless steel; hot-dip, zinc-coated steel or materials, of sufficient strength to withstand ballistic resistant assembly.

2.3. GLAZING

A. Bullet Resistant Glazing:
   1. LEXGARD® MP-750 Laminate: 3-ply, clear, extruded LEXGARD polycarbonate and acrylic sheet of the following construction:
      a. 1/8 inch polycarbonate sheet with high AR abrasion-resistant surface.
      b. Polyurethane bonding interlayer.
      c. 1/2 inch Acrylic sheet.
      d. Polyurethane bonding interlayer.
      e. 1/8 inch polycarbonate sheet with high AR abrasion-resistant surface.
      f. Material shall have a flexural strength of at least 13,500 psi per ASTM D790; and shall have AR (high performance abrasion-resistant) surfaces for enhanced service life and resistance to marring. Material shall exhibit a C2 (CC22) flammability performance level for Approved Light Transmitting Plastic.
      g. Level 1 - 9mm or .38 Special caliber rated.

2.4. DEAL TRAYS AND SHELVES

A. Manufacturers - Deal Trays:
   1. Quikserv Corp.

      a. Model QS-1612:
         1) Transfer Area: 10 inches (w) x 2 inches (d) x 14 inches (l).
         2) Finish: 304 Stainless Steel with number 3 finish.

3.1 FABRICATION

A. Fabricate to provide a complete system for assembly of components and anchorage of drawers and accessories.
   1. [Provide units that are reglazable from the secure side without dismantling the nonsecure side of framing.]

B. [Rigidly fit and secure joints and corners with internal reinforcement. Make joints and connections flush, hairline, and weatherproof. Fully weld corners.
   1. Fabricate framing with manufacturer's standard, internal opaque armoring in thicknesses required for security windows to comply with ballistics-resistance performance indicated.]

C. Welding: To greatest extent possible, weld before finishing and in concealed locations to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

D. Metal Protection: Separate dissimilar metals to protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.

E. [Bottom Sills: Stainless steel construction, no bottom tracks and no pop rivets.]

3.2 SHOP FINISHING

A. Aluminum Finishes:
   1. Mill Finished Aluminum Surfaces: manufacturer's standard finish.
   2. Clear Anodized Aluminum Surfaces: AA-M10C22A31 non-specular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class II 0.7 mils (0.018 mm) clear anodized coating.
      a. Conform to AAMA 611.

B. Concealed Steel Items: [Galvanized in accordance with ASTM A123 to thickness Grade 85, 2.0 oz/sq ft (610 gm/sq m).

C. Stainless Steel: 304 Stainless Steel with NAAMM No. 3 finish.

D. Apply bituminous paint to concealed metal surfaces in contact with cementitious or dissimilar materials.

E. Touch-Up Primer for Galvanized Steel Surfaces: SSPC Paint 20 zinc rich.

F. Extent of Finish:
   1. Apply factory coating to all surfaces exposed at completed assemblies.
   2. Apply finish to surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

3.3 EXAMINATION

A. Verify construction is ready to receive Products specified in this section.

B. Verify rough openings are correct size and in correct location.

C. Examine roughing-in for embedded and built-in anchors to verify actual locations of security window connections before security window installation.

D. Inspect built-in and cast-in anchor installations, before installing security windows, to verify that anchor installations comply with requirements. Prepare inspection reports.
   1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
   2. Perform additional inspections to determine compliance of replaced or additional work. Prepare anchor inspection reports.

E. For glazing materials whose orientation is critical for performance, verify installation orientation.

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

3.4 PREPARATION

G. Furnish frames and anchors to other sections as required for installation in surrounding partition and casework construction.

3.5 INSTALLATION

A. Install Products in accordance with manufacturer's instructions.

B. Align Products plumb, level and square.

C. Rigidly secure Products to adjacent supporting construction.

D. Seal perimeter joints.

E. Protection: Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended in writing by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

3.6 ADJUSTING

A. Remove and replace defective work, including security windows that are warped, bowed, or otherwise unacceptable.

3.7 CLEANING AND PROTECTION

A. Remove protective material from factory finished surfaces.

B. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.

C. Clean metal and glass surfaces to polished condition.

D. Provide temporary protection to ensure that equipment is without damage at time of Substantial Completion.

3.8 DEMONSTRATION

E. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transaction drawers.

END OF SECTION

SPENCER COUNTY BOARD OF EDUCATION
OFFICE ADDITION AND RENOVATION

PROJECT MANUAL – VOLUME 3

Spencer County Board of Education
Office Additiona and Renovation
SCB 2448 / BG #25-166

February 26, 2025

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Spencer County Board of Education
Taylorsville, Kentucky

SUPERINTENDENT – Dr. William Foster

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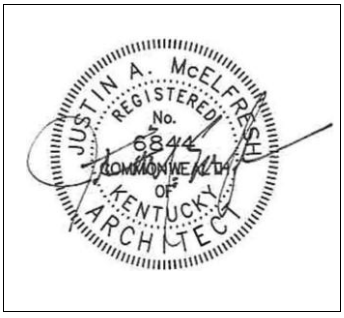

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SCB PROJECT NO. 2448

Unless noted otherwise, the following shall apply to all manufacturers listed herein. Subject to compliance with Contract Documents, manufactures listed are approved as a manufacturer only. This does not imply that specific products supplied by such manufacturers have been reviewed and comply with requirements. It shall be the manufacturer's / contractor's responsibility to ensure that all requirements of the Contract Documents are met.

END OF INDEX

SECTION 22 01 00 – GENERAL PROVISIONS FOR PLUMBING

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers the general arrangement of the plumbing systems and related items to complete the work as shown on the drawings and as specified herein.

B. The General and Special Conditions and all other Contract Documents are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

C. The Contractor shall familiarize himself with the work of all other trades, general type construction and the relationship of his work to other sections. He shall examine all working drawings, specifications and conditions affecting his work. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, verify all dimensions in the field and advise the Engineer of any discrepancy before performing any work.

D. The work shall include complete testing of all equipment and piping at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment.

E. The Contractor shall perform all necessary temporary work during construction.

F. Work under this section shall conform to all governing codes, ordinances and regulations of the City, County and State.

G. The Contractor shall be responsible for all errors in fabrication, for the correct fitting, installation and erection of the various plumbing systems as shown on the drawings.

1.2 SCOPE

A. This branch of the work includes coordination with all utility companies; providing utility meters; utility tap on fees; agency review fees and all inspection fees; all labor, materials, tools, excavation and backfill and all equipment necessary for the installation of Plumbing Systems as shown on the Drawings and Specifications and/or as required for complete and operating systems. The work shall include starting, balancing and the necessary and required tests to insure the proper operation of the complete system.

B. A complete and operating plumbing system shall be provided. See plans for diagrams and details.

C. All work for this project must comply and be in strict accordance with the Kentucky Building Code, Kentucky Plumbing Code, Kentucky Boiler Code, NFPA, ADA, NEC and all local codes and regulations.

D. In general (as a minimum) all materials and equipment must be installed in strict accordance with manufacturer's requirements; and provided with all required controls, internal fusing, relays, piping connections, electrical connections, etc., to provide for complete and operable systems.

E. All equipment shall be manufactured within 24 months of bid date, no exceptions. Any equipment installed outside of this timeframe shall be removed and replaced to meet this requirement at no additional cost to the owner.

1.3 PERMITS, FEES, CODES AND APPROVALS

A. Permits and Fees

1. All permits, tap on fees and agency review and inspection fees necessary for the complete Fire Protection and Plumbing systems shall be obtained by the Contractor from the authorities governing such work. The cost of all permits shall be borne by the Contractor.

B. Codes

1. The minimum standard for all plumbing work shall be the requirements of the Kentucky State Plumbing Law, Regulation and Code, Kentucky Building Code, ADA, The Division of Water Quality, and local ordinances. All plumbing and fire protection for this project must as a minimum comply and be in strict accordance with the Kentucky Building Code, Kentucky Plumbing Code, Kentucky Boiler Code, NFPA, ADA, NEC, The Division of Water Quality and the "Standards of Safety" of the Commonwealth of Kentucky.

2. All drinking water system components that convey or dispense water for human consumption through drinking or cooking shall be NSF/ANSI 61 and/or NSF/ANSI 372 certified or listed as ‘lead free’ and meet any and all state and local requirements.

C. Approvals

1. All work must be approved by the Architect/Engineer, Owner and all related Code Agencies before final payment will be made.

2. As a minimum, the following approval Certificates of Inspection and Approval shall be required:

a. Plumbing Inspection

b. Health Department Inspection

c. Electrical Inspection

d. Local and State Building Inspections.

3. Final payment will be contingent upon all Approval Certificates.

1.4 DRAWINGS AND SPECIFICATIONS

A. Contract drawings for work under this section are in part diagrammatic, intended to convey the scope of work and indicate the general arrangement of equipment, piping and the approximate size and location of equipment and outlets. The Contractor shall follow these drawings in laying out his work and shall verify spaces in which his work will be installed, indicating to the Engineer where any conflicts or overlapping of systems occur. Any item of work not clearly included, specified and/or shown, errors or conflict between Plans (Plumbing, Mechanical, Architectural, Structural or Electrical), Specifications, codes and field conditions, shall be clarified by a written request to the Architect by the Bidder before bidding; otherwise, the bidder shall, at his own expense, supply the proper labor and materials to include these items of work and to make good any damages or defects in his work caused by such error, omission or conflict. Under no circumstances shall a Contractor scale the Drawings for the location of equipment and work.

B. Where job conditions require reasonable changes in indicated locations and arrangement, proposed departures shall be submitted with detailed drawings to the Engineer for approval before any of the proposed work is commenced. All approved departures shall be made at no additional cost to the Owner.

C. The drawings and the specifications are intended to indicate complete and working systems, unless specifically indicated to the contrary. The work includes the furnishing, installing, and connecting of a complete working installation in each case to the full extent set forth in the drawings and herein specified. The Contractor shall be responsible for the complete functioning system, unless specifically noted otherwise.

D. The drawings and specifications constitute the Contract Documents and shall be considered as cooperative. Work and material included in either, though not mentioned in both, shall be a part of the work to be accomplished and shall be carried out completely in as thorough manner as if covered by both. All items shown on the drawings and/or listed in the specifications shall be provided and installed by the Contractor unless specifically noted that it will be provided and/or installed by others. In the event there is a conflict within the Contract Documents, the Contractor shall notify the Engineer immediately. If a clarification is not given, the Contractor shall bid the more stringent of the two requirements.

E. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and accessories that may be required. The Contractor shall carefully investigate the structural and finish conditions affecting all his work and shall arrange such work, accordingly, furnishing such fittings, pipe, traps, valves, and accessories as may be required to make a functional installation at no additional cost to the Owner.

F. Plumbing as built "Record Drawings" shall be kept up to date each day. "Record Drawings" shall be reviewed by Architect/Engineer each month with contractor's pay request review.

G. Any deviation in work as shown on plans and specifications must be approved in writing by Architect/Engineer prior to installation.

1.5 EXAMINATION OF SITE

A. Bidders shall visit the site before submitting proposals to satisfy themselves as to the nature and scope of the work and any difficulties attending to the execution.

B. The submission of a proposal will be construed as evidence that such an examination has been made. Later claims for labor, equipment, materials, etc., required for difficulties encountered which could have been foreseen had such an examination been made, will not be recognized.

1.6 EQUIPMENT DESIGN AND INSTALLATION

A. The design, manufacture, testing and method of installation of all apparatus and materials furnished under the requirements of these specifications shall conform to the applicable standard rules of the following. Where materials are not specifically referred to, but are required, they shall meet the requirements of the applicable code.

1. NEMA -National Electrical Manufacturer's Assoc.
2. UL -Underwriter's Laboratories, Inc.
3. ASME -American Society of Mechanical Engineers
4. ASTM -American Society of Testing Materials
5. ASHRAE -American Society of Heating, Refrigerating and Air Conditioning Engineers
6. BOCA -Building Officials & Code Administrators International, Inc.
7. NFPA -National Fire Protection Association
8. AWWA -American Water Works Association
9. AWS -American Welding Society
10. AMCA -Air Moving and Conditioning Assoc.
11. ANSI -American National Standards Institute
12. NEC -National Electrical Code

13. AIEE -American Institute of Electrical Eng.
14. ARI -Air Conditioning & Refrigeration Institute
15. SMACNA -Sheet Metal and Air Conditioning Contractors National Assoc.
16. LSDHBC -Local and/or State Division of Housing, Building and Construction
17. SPC -State Plumbing Code
18. NPC -National Plumbing Code
19. OSHA -Occupational Safety and Health Adm.
20. EPA -Environmental Protection Agency
21. DOE -U.S. Department of Energy
22. IMC -International Mechanical Code
23. IECC -International Energy Conservation Code

B. Unless otherwise specified, equipment and materials of the same type and used for the same purpose, shall be products of the same manufacturer.

1.7 CAPACITIES, SIZES AND OPERATING CONDITIONS

A. Capacities, sizes, and conditions specified or shown on drawings shall be regarded as minimum allowable. If the Contractor proposes to furnish any equipment which would have to operate at other than specified conditions to produce final effects, all other directly or indirectly related components of the entire systems (as well as of the structure, finish and other systems in the building) must be properly coordinated to the satisfaction of the Engineer. That is: Operating conditions through the entire system must be such that no motor is overloaded, no equipment operates noisier, faster, or hotter than manufacturer's publication recommends and that no excess stress or demand is imposed on any component of any system or the structure; also that no quality, architectural feature, function or "end result" is affected adversely, in the opinion of the Architect.

B. The Architect/Engineer reserves the right to determine if the contractor's proposed materials and equipment of any one manufacturer is acceptable in lieu of the specified material or equipment.

C. Where materials and equipment are listed on Drawings and specifications as acceptable or equivalent, this does not relieve the contractor and/or manufacturer from providing and proving to Architect/Engineer that their materials and equipment are equivalent to items the Architect/Engineer used as a guide specification.

D. The contractor and manufacturer must confirm to the Architect/Engineer that their equipment and materials will meet the space requirements of the project and that the equipment is easily accessible for maintenance and operation.

E. In the event there is a conflict within the Contract Documents, the Contractor shall notify the Engineer immediately. If a clarification is not given, the Contractor shall bid the more stringent of the two requirements.

1.8 LAYOUT

A. The Contractor's work lines, and established heights shall be in strict accordance with drawings and specifications insofar as these drawings and specifications extend. The Contractor shall verify all dimensions shown and establish all elevations and detail dimensions not shown. He shall also correlate the time so that the work will proceed to the best advantage of the complete job as a unit. The Contractor shall be responsible for furnishing in ample time, any information required to revise footing elevations, build all chases and openings in floors, walls, partitions, ceilings, and roofs to provide clearance which may be required to accommodate the work. The contractor shall set all sleeves,

anchor bolts and inserts required to accommodate his equipment before masonry is constructed.

B. The Contractor shall layout his work well enough in advance to foresee any conflicts or interferences with work of other sections so that in case of interference, his layout may be altered to suit the conditions, prior to the installation of any work. This procedure will require constant coordination with all sections of the work.

1.9 DEMOLITION AND SCHEDULE

A. All existing plumbing equipment noted on drawings and listed herein that is to be removed or demolished, shall be removed on schedule and disposed of as hereinafter directed.

B. All items removed shall become the property of the contractor and shall be immediately disposed of offsite at contractor's expense except as noted on drawings unless otherwise directed by owner.

C. All demolition shall be carefully accomplished in accordance with master construction schedule so as not to remove any item required for support operation during the planned schedule. No item shall be removed until full schedule is worked out with contractors according to owners demands and agreed to in writing by the Engineer.

D. Storage will be arranged during scheduling process. Contractors to provide own storage and security.

E. Contractor doing the demolition of equipment must conform to the Clean Air Act of 1990. Refrigerant must be recovered from any air conditioning or refrigeration equipment prior to disconnecting and disposal. The contractor must own and use recovery equipment to meet this requirement. The contractor will be responsible for disposal of refrigerant, refrigerant oil, or equipment.

F. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damage or unserviceable portion and replace with new products of equal capacity and quality. All existing piping to remain shall be permanently capped, new or existing valves are not adequate.

1.10 ACCESSIBILITY

A. All equipment, valves, motors, traps, unions, and all other items which require adjustment, maintenance, repair, and observation shall be installed in such a fashion that such maintenance, repair, and observation can be readily achieved without undue difficulty. Where the drawings show these items in locations not conforming to the above, the Contractor shall advise the Architect/Engineer of this conflict prior to bid Date otherwise he shall, at his own expense, relocate such items as directed by the Architect/Engineer. Where such items are installed above inaccessible ceilings or in or behind walls, this contractor shall provide approved access panels unless otherwise directed in these Specifications.

1.11 ARCHITECTURAL DRAWINGS AND SPECIFICATIONS

A. Each Contractor shall refer to the Architectural and Civil Drawings and Specifications for the general construction of the building, for floor and ceiling heights, for location of walls, partitions, beams etc., and shall be guided accordingly for the setting of all sleeves and equipment.

B. Under no circumstances shall a Contractor scale the Drawings for the locations of equipment and work.

1.12 STRUCTURAL DRAWINGS AND SPECIFICATIONS

A. Each Contractor shall refer to the Structural Drawings and Specifications for the general construction of the building, for floor and ceiling heights, for location of walls, partitions,

beams, grade beams, foundations, footings etc., and shall be guided accordingly for the setting of all sleeves and equipment.

B. Under no circumstances shall a Contractor scale the Drawings for the locations of equipment and work.

C. The contractor is responsible for reviewing all below slab / underground piping with structural components and coordinating all stepped footings or sleeves where required.

1.13 COOPERATION WITH OTHER CONTRACTORS

A. Each Contractor shall demand and examine all Drawings and Specifications pertaining to the construction before installing the work described and shown under these Drawings and Specifications. Each Contractor shall cooperate with all other contractors in locating piping, openings, chases, and equipment in order to avoid conflict with any other contractor's work. It is the responsibility of all trades to examine all shop drawings of other trades that would require equipment to occupy the same space and plane within the building to eliminate any potential conflicts. No extra payment will be allowed for relocation of piping, and equipment not installed in accordance with the above instructions, and which interferes with work and equipment of other contractors.

1.14 INSTALLATION OF EQUIPMENT

A. All appliances, materials and equipment shall be installed and connected in accordance with the best engineering practice and in accordance with manufacturer's instructions and recommendations. All auxiliary piping, special controls, water seals, valves, electrical connections, drains, etc., recommended by the manufacturer, required for proper operation, or required by code shall be furnished and installed complete.

B. All equipment designed and constructed for indoor use shall not be shipped to the site until such time that the equipment is ready for permanent installation in a dry building or may be stored on site provided equipment is stored in a water and moisture tight storage building or job trailer. Covering equipment outdoors with plastic or tarp is not acceptable.

1.15 PROTECTION

A. No piping shall be installed in any part of the building where danger of freezing may exist without adequate protection being given, whether insulation is specified for the particular piping. All damage resulting from leaking pipes shall be borne by the Contractor under this Division.

B. All work, equipment and materials shall be protected at all times. All pipe openings shall be closed with caps or plugs during construction. All equipment and accessories shall be tightly covered and protected against dirt, water, or other injury during the period of construction.

1.16 CUTTING AND PATCHING

A. All cutting and patching required in connection with the installation of this work, and work due to errors, defective work, ill-timed work or tardiness in properly designating size and location in sufficient time or by failure to notify other trades, shall be done under this section, but only in the manner directed by the Engineer so as to prevent or minimize damage to installed work. Damage as a result of cutting for installation, shall be repaired by mechanics skilled in the trade involved, at no additional expense to the Owner.

B. No cutting of structural members will be permitted, except when prior permission of the Engineer has been obtained. This work must conform in every respect to the surrounding finish and to the quality of workmanship and materials used.

C. Piercing of any waterproofing or roofing shall be done only by the trade involved. After the part piercing the waterproofing has been set in place, the opening made for this purpose shall be filled and made absolutely watertight to the satisfaction of the Engineer.

D. See Section: 220517 - SLEEVING, CUTTING, PATCHING AND REPAIRING

1.17 FIRE AND SMOKE-STOPPING

A. Fire-stopping and smoke-stopping shall be provided around all piping penetrations of fire rated and/or smoke-rated floors, walls, ceilings, or other barriers.

B. The materials used shall be UL 263 or UL 1479 classified and meet ASTM E814 standards and be rated for assemblies where applied.

C. Clean surfaces to be in contact with penetration seal materials, of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance.

D. Install penetration seal materials in accordance with manufacturer's instruction.

E. Seal holes or voids may be penetrations to ensure an effective fire and/or smoke barrier.

F. Protect materials from damage on surfaces subject to traffic.

G. Stop insulation flush with wall on insulated pipe and seal edges.

H. All exposed piping passing through floors, ceilings and walls in finished areas shall be fitted with a chrome plated escutcheon of sufficient outside diameter to amply cover the sleeved opening and ad inside diameter to closely fit the pipe around which it is installed.

1.18 CONCRETE WORK AND ANCHOR BOLTS

A. The Contractor under this Division shall provide all concrete bases, curbs and pads for all floor and ground mounted equipment unless otherwise indicated.

B. The Contractor under this Division shall verify the sizes and locations of all supports, bases, and pads prior to pouring of same to be certain that the installed units will be compatible.

C. The Contractor under this Division shall set anchor bolts when required for the equipment prior to pouring of concrete. Sizes and exact locations of bolts shall be determined by the manufacturer's recommendations for the equipment served.

D. Concrete work must be provided in strict accordance with Section 03 Concrete Work. As a minimum provide pads using 3500 psi concrete not less than 3.5 inches high reinforced with WI.4 x WI.4 welded wire fabric. Chamfer top and edge corners with 3/4" preformed chamfer strips. Subbases shall rest on structural floor and shall be reinforced with steel rods and interconnected with floor reinforcing bars by tie bars hooked at both ends or suitable dowels. Slope top to floor drain if drain is provided in pad.

1.19 ACCESS PANELS

A. The Plumbing Contractor shall furnish all other access panels needed for access to valves, open receptacles, etc., in inaccessible locations installed under this Division of the work.

B. Access panels shall have a minimum size of 12" x 12" and shall be centered beneath equipment for accessibility and maintenance. Access panels must be of adequate size to service, observe, remove, and maintain equipment.

C. Access panels shall be equal to the types specified under the Architectural Specifications. As a minimum the access panels shall be equivalent to Acudor Products, Cendrex, Inc., MIFAB, Inc., Lane-Aire Manufacturing, 14 gauge with vandal proof lock and frame as selected by Architect. Access panels shall be fire rated when installed in fire rated construction.

D. Access panels shall have a primed white finish.

E. Ceiling Types

1. In areas with suspended acoustical tile ceilings (installed on exposed metal grid suspension system so that the tile may be readily removed), equipment, valves, etc., install above these ceilings will be accessible.

2. All plastered ceilings or ceilings having concealed spline type of suspension system will be considered as not removable for accessibility to equipment; therefore, access panels will be required.

3. See Architectural Drawings and Specifications for the types of ceilings throughout the building.

F. Access panels shall be installed by sub-contractor specialized in access panel installation.

1.20 CONNECTION TO EQUIPMENT SPECIFIED IN OTHER SECTIONS

A. Examine all Contract Documents and be thoroughly familiar with all items of equipment in other sections or by Owner, unless otherwise specified or indicated on Drawings. Rough-in for and make final connections to all equipment which requires any of the services specified in this Section and including furnishing and install all valves, P-traps, unions, vacuum breakers and all other specialties as required to make all work and equipment final and operating. It is the intent of the Contract Drawings to detail and indicate all such equipment; however, be responsible for notifying Architect/Engineer in writing of major discrepancies seven (7) days prior to Bid Date; otherwise, all such connections shall be made at no extra cost.

B. Unless specified otherwise, all conduit, wiring and connections for power to plumbing equipment will be provided by Electrical Contractor. Be responsible for correct sequences of operation of all plumbing equipment after all wiring has been completed.

1.21 OPERATING INSTRUCTIONS

A. After all tests have been completed and work accepted by the Owner, a competent representative shall, at a time determined by the Engineer, present verbal, and visual instructions to the Owner's personnel in the proper operation of his respective system. For this purpose, each section of work shall be demonstrated and explained to the Owner's personnel and sufficient time allotted for instructions. See Specification Section 220600.

1.22 SAFETY

A. The contractor and his subcontractors for the project shall comply with all applicable Federal, State, and local laws governing safeguards, safety devices, and protective equipment and shall take all other needed actions which they may determine or which the Department may determine to be reasonably necessary to protect the life and health of all employees and personnel on the project, provide for the safety of the public and protect all property affected by the performance of the work covered by the contract.

B. As provided in KRS Chapter 338 in the Kentucky Occupational Safety and Health Act and in subsequent regulations and standards promulgated by the Kentucky Occupational Safety and Health Standards Board, neither the Contractor nor his subcontractors shall require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety.

C. The contractor shall not remove or disturb any suspected hazardous materials, including asbestos-containing materials, lead based paints, electrical equipment containing PCB’s, or any other except as instructed in this contract. If any material not covered by the contract is encountered, notify the Engineer immediately.

1.23 TESTS - GENERAL

A. All tests required to establish the adequacy, quality, safety, completed status and suitable operation of each system and all components thereof shall be made in the presence of and to the satisfaction of the Engineer or his authorized representative and other representatives of State and local Government. All instruments, labor, and expert service necessary to conduct these tests shall be supplied by the Contractor; power and fuel will be furnished by the Owner.

B. The final inspection and tests are to be made only after the Engineer is satisfied that the work described in these specifications has been completely installed in accordance with the true spirit and intent of these specifications and that complete preliminary tests were made which indicate adequacy, quality, completion and satisfactory operation. The acceptance of the work herein specified, shall not in any way prejudice the Owner's right to demand replacement of defective material and/or workmanship.

1.24 CLEANING

A. General: Clean all piping and equipment systems as required to leave the piping and equipment clean and free from scale, silt, contamination, etc., as normally required and as specified herein.

B. Utilities and Equipment: The Contractor shall provide all necessary temporary materials and equipment to clean the piping and equipment installed under this specification. No permanent equipment shall be used for storage, mixing, settling, compressing, pumping, etc., without the approval of the Architect. The Contractor shall supply a separate and independent source of clean, dry, oil-free air for the blowdown of systems requiring this method of cleaning.

C. Use of Chemicals: No chemicals, wetting or drying agents shall be used to clean systems or equipment where the materials of the system undergo any changes in their physical or structural characteristics. In case of any doubt as to the compatibility of any materials to the cleaning solution used, the Contractor shall obtain prior written approval for the use of the solution from the manufacturer of the equipment. Piping systems, equipment and sub-assemblies shall be cleaned after completion of welding, machining, threading, testing and any other operations capable of contaminating the system piping or equipment. After cleaning, the permanent strainers shall be removed, cleaned, and replaced. Temporary strainers shall be periodically removed, cleaned, and replaced during cleaning in lines ahead of equipment to protect against particles becoming lodged in the equipment.

D. After the Architect/Engineer has complete examination, this Contractor shall remove all stickers, tags, etc., and shall thoroughly clean all equipment, fixtures, and materials installed under his section of the work.

E. Surplus material, rubbish and equipment resulting from the work shall be removed from the building and premises by the Contractor upon completion of the work in accordance with the General Conditions.

F. All equipment shall be thoroughly cleaned to "Factory New" condition prior to turning over to owner. Touch up or completely repaint equipment as required.

G. Keep all nameplates on equipment clean and exposed for easy reading.

1.25 WARRANTY AND SERVICE

A. All equipment shall be warranted for a period of at least one (1) year from the date of acceptance, as evidenced by date of substantial completion for the entire project or for the last phase of the project, whichever occurs later, against defective materials, design, and workmanship. In addition to the equipment warranty, the Contractor shall provide all repair and adjustment service necessary for the proper operation of the entire system for a period of one (1) year after the date of acceptance, as evidenced by the date of substantial completion for the entire project or for the last phase of the project, whichever

occurs later. Upon receipt of notice from the Owner's representative of failure of any part of the warranted system or equipment during the warranty period, the affected part shall be replaced promptly with a new part without cost to the Owner. Upon failure to take action within 24 hours after being notified, the work will be accomplished by the Engineer at the expense of the Contractor. See General Conditions and individual equipment specifications. Note that the warranty period of time specified in this section represents the minimum warranty period required for work performed under specification Division 21, 22 and 23. Where the General Conditions and/or individual equipment/system specifications require a warranty period of longer duration or earlier start date than specified in this paragraph, the longer duration/earlier start date shall supersede for those portions of work covered by that specification. In the event the contractor is notified of warranty issues but does not correct or address the warranty issues prior to the end of the specified warranty period, the contractor will not be relieved of the responsibility to correct the deficient items after the warranty end date has passed.

B. Make a minimum of two (2) service calls during guarantee period, free of charge, to check with Owner and to check and repair malfunctioning equipment which was installed. Service calls shall be in middle and end of guarantee period and as required to maintain systems operation. Dates shall be listed in operating and maintenance manuals, along with contractor's name and phone number.

1.26 ELECTRIC MOTORS

A. All motors shall be designed, tested, and applied in accordance with the applicable standards listed hereinbefore. Motors shall be of sufficient size for the duty to be performed and shall not exceed the full load rating when the driven equipment is operating at specified capacity. Unless otherwise specified, all motors shall be high efficiency type and shall have open frames and continuous-duty classification based on 50 degrees C. ambient temperature. Polyphase motors shall be squirrel-cage type, having normal-starting-torque and low-starting-current characteristics. Motors shall meet NEMA high efficiency standards MGI - 1.41.2 for energy efficient polyphase squirrel-cage motor. Efficiency shall be in accordance with MGI - 1.2.55. When motor horse powers required differ from those indicated on the drawings, the Contractor shall make the necessary adjustments to the wiring, disconnect devices, starters, and branch-circuit protection at no additional cost to the Owner.

1. Motors shall be rated for continuous duty capable of driving the connected loads without exceeding temperature limitations of the motor insulation. Special Class A moisture-resisting insulation (designed to operate in a 50-degree C. ambient without exceeding a temperature rise rating designated by NEMA for the type of enclosure used) shall be utilized in each motor.

B. Unless otherwise indicated or specified, the electrical components required to operate plumbing equipment, such as, motors, float and pressure switches, solenoid valves, and other devices functioning to control the plumbing equipment, shall be furnished as part of the plumbing equipment, shall be complete and operable, and shall be included under this section of the specifications. All motor starters not part of a motor control center shall be included under this Section and shall be the hand off auto type with 3 over-loads on 3 phase units and 120V control transformer. Conduit and wires required for external electrical connections shall be furnished and are specified under DIVISION 26 - ELECTRICAL. Integral phase failure relay shall be provided as a part of all three phase motor starters. Relay shall shut motor down on phase loss or phase unbalance and automatically reset when normal phasing is restored. Phase failure relay shall have adjustable restart time capabilities. Plumbing contractor shall coordinate staggered restart times as required.

1.27 AS-BUILT DRAWINGS

A. The Contractor shall deliver to the Engineer at the completion of the work, one (1) print of "As-Built" drawings, showing legibly and accurately, plumbing and piping systems with equipment locations shown as actually installed. Changes in original plans shall be neatly shown in red pencil. Each print shall be signed by the sub-contractor who has done the work.

B. During construction, the Contractor shall retain a set of blue line drawings on the site for recording all changes. These drawings shall be available for inspection by the Engineer.

1.28 TESTS

A. The Architect/Engineer shall be notified by the Contractor under this Division forty-eight (48) hours in advance of any tests so that the Architect/Engineer or his representative may be present when the tests are run. Leaks or imperfections found shall be corrected and a new test shall be run to the satisfaction of the Architect/Engineer. Upon successful completion of the test, pipe covering may be applied, and piping may be concealed. A successful test, even if witnessed, however, does not relieve the Contractor under this Division of the responsibility for any failure during the guarantee period.

B. After pipe fabrication has been completed, all water piping shall be subjected to a hydrostatic test of 100 psi and proven tight and free of leaks for a 24-hour period. Tests shall be applied to the piping before being attached to any equipment which would be damaged by the test pressure. Damage to equipment caused by testing shall be repaired or replaced without additional cost to the Owner.

C. The sanitary sewer piping and sanitary waste, vent and drainage piping installed under this Division in, under or outside the building shall be tested by means of water, smoke or air in accordance with the Kentucky State Plumbing Law, Regulation and Code, Division of Water Quality and the local utility company requirements. These shall be made in the presence of the Plumbing Inspector and the Architect/Engineer.

D. Exterior water piping shall be tested in strict compliance with local water company. The minimum hydrostatic test pressure is 1 1/2 times the water pressure serving the site.

E. No insulation, paint, backfill or other prohibitive covering shall be applied to piping prior to the above tests.

F. Provide all temporary equipment, materials, valves, gauges, etc., required for the preceding tests.

G. The expense of all tests shall be borne by the Contractor under this Division.

1.29 CONTRACTOR FURNISHED DRAWINGS, DESCRIPTIVE DATA AND MANUALS

A. Approval of Materials and Equipment: Within 30 days of receipt of notice to proceed, and before starting installation, the Contractor shall submit to the Architect for approval, in triplicate, lists of materials, fixtures and equipment to be incorporated in the work. If departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including changes in related portions of the project and the reasons therefore shall be submitted with drawings. Where such departures require piping or equipment to be supported otherwise than shown, the details submitted shall include loadings and type and kinds of frames, brackets, stanchions, or other supports necessary. Approved departures shall be made at no additional cost to the Owner. The lists of materials and equipment shall be supported by sufficient descriptive material, such as catalog cuts, diagrams, and other data published by the manufacturer, as well as evidence of compliance with safety and performance standards, to demonstrate conformance to the specification requirements; catalog numbers alone will not be acceptable.

B. Conformance to Agency Requirements: Where materials or equipment are specified to be constructed and/or tested in accordance with the standards of the American Society of Mechanical Engineers, the Air Moving and Conditioning Association, or the American

Society of Heating, Refrigerating and Air Conditioning Engineers, or to be approved by the Underwriters' Laboratories, Inc., the Contractor shall submit proof that the items furnished under this specification conform to such requirements. A certificate or published statement by the manufacturer will be sufficient evidence that the item conforms to the specified requirements. In lieu of such stamp, certificate, or statement, the Contractor may submit written certificate from any nationally recognized testing agency adequately equipped and competent to perform such services, stating that the items have been tested and that the units conform to the requirements listed hereinbefore, including methods of testing, of the specified agencies.

C. Shop Drawings

1. In accordance with the General Conditions, shop drawings shall be submitted on all units of prefabricated materials. Shop drawings shall show, in detail, all parts of the work, fully dimensioned and shall also indicate construction, concealed and other jointing, thickness of materials, method of anchoring and attachment to other materials. Where required for certain work, submit setting and bending diagrams and mark same to correspond with the design drawings, identifying locations of various items. Show types, sizes and locations of sleeves and inserts.

2. The Contractor shall check all shop drawings for completeness and for correctness before submitting the drawings. If major corrections are required on the drawings, the Contractor shall return the drawings to the originator and have the changes made. The Contractor shall indicate his corrections on the prints in green pencil and sign all prints and other material sent to the Engineer.

3. Detail and Erection Drawings: Detail and erection drawings for equipment, piping and other items of this nature shall be carefully prepared in accord with standard practice and shall show erection plans and member details with all individual parts identified on both the detail sheets and erection plans. All identification markings shall be carefully preserved until after the erection process is completed.

4. Material Data: The Contractor shall submit descriptive data, as required, on pipe, fittings, and valves to be incorporated into the work. This data shall be in sufficient detail to allow the Engineer to determine that the pipe, fittings, and valves meet the requirements of the contract drawings and specifications or that they are an acceptable equal to that specified. All data shall be in the form of manufacturer's or supplier's literature concerning the product and shall indicate catalog number, conditions of use, application instructions, and/or other information as applicable.

5. Equipment Data: The Contractor shall submit descriptive data on all items of equipment to be furnished and installed under this contract. These submittals shall consist of manufacturer's published catalog information which completely describes component materials, configuration and rough-in data for plumbing and electrical equipment shall also include cuts, diagrams, characteristic curves, and capacity information as applicable. Where more than one item of equipment is employed in the same system, the submittal of equipment data will include special diagrams showing the electrical wiring, interconnecting piping, related controls and relation and operation of the various items of equipment for the entire system.

D. Operating Instructions and Maintenance Manuals, Etc.

1. At completion of the contract, the Owner shall be provided with three (3) bound copies of operations and maintenance instructions, recommended list of spare parts required for a period of one (1) year and a list of any special tools required to maintain the equipment for the various items of the plumbing equipment.

Where special tools are required, the Contractor shall furnish two (2) of each such tools to the Owner at no additional contract cost.

2. MANUAL SHALL INCLUDE ALL APPROVED SHOP DRAWINGS OF EQUIPMENT REQUIRING OPERATION AND MAINTENANCE INFORMATION.

3. MANUAL SHALL BE ORGANIZED WITH APPROVED SHOP DRAWING FOLLOWED BY ALL RELATED OPERATION AND MAINTENANCE MATERIAL.

4. EQUIPMENT SHALL BE IDENTIFIED IN ACCORDANCE WITH THE DRAWING NOMENCLATURE AND INCLUDE SUPPLIER OF SAID EQUIPMENT.

5. Instructions shall be included for routine checking of all items requiring continued maintenance.

6. Schematic drawings with actual pieces of plumbing equipment, etc., shall be included; where manufacturer's parts numbers only are applicable, they shall be included.

7. Detailed operating instructions for plumbing equipment shall be included, as well as general maintenance procedures to be followed on such equipment. Manufacturers maintenance and operation manuals will be required where such are normally available with the equipment, but as such information is often of a general nature and applicable to various models of equipment, such information shall be supplemented by specified typed directions for the particular piece of equipment applicable to this project.

E. Materials, Equipment and Appliances

1. Materials: All materials, equipment, products and incidentals to be furnished by the Contractor shall be new, unless otherwise specified, undamaged and the first line quality product of the manufacturer and/or supplier, except when competitive grades fully meet the standards specified in the various technical sections of these specifications.

2. Standard Products: Except as otherwise approved by the Engineer, the equipment, and appliances to be furnished under these specifications shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design. Where two or more units of the same type and class of equipment are required, the units shall be the product of the same manufacturer and shall be identical insofar as possible. The component parts of the products need not be products of one manufacturer.

3. Manufacturer's Directions: Where manufacturer's instructions or recommendations are applicable to the installation or application of materials, the Contractor shall adhere to strict conformance with such instructions or recommendations unless specifically noted to the contrary in these specifications. Where such directions conflict with the drawings and specifications, the Contractor shall inform the Engineer of such conflict and request instructions.

4. Samples: The Contractor shall furnish, for approval, samples of materials, profiles, designs, finishes, etc., which are either required by the various sections of specifications or which the Engineer may request from time to time. Samples shall be clearly identified with adequate information for the Engineer's evaluation.

5. Materials and Equipment Delivered to Jobsite: All items of materials, equipment, supplies and miscellaneous items to be incorporated into the work shall be delivered to the jobsite with labels, tags, nameplates and/or containers which clearly indicate the manufacturer's item or catalog number or conformance with the applicable standards stipulated in the technical sections of the specifications.

Any item which cannot be verified in the field shall not be included in the work until its identity can be established by the Engineer.

F. Equipment and Material Substitutions

1. Should the Contractor elect to use and install materials which have been approved for use other than specified, he shall be required to make any necessary changes, perform all work and furnish any additional materials and ancillary equipment required to make such substituted materials or equipment function or perform as that specified, at no cost to the Owner. This includes structural, electrical and/or other affected trades.

1.30 DEFINITIONS

A. Plumbing Contractor: Any contractor whether bidding or working independently or under the supervision of a general contractor and/or construction manager and who installs any type of plumbing work.

B. Plumbing Sub-Contractor: Any contractor contracted to or employed by the plumbing contractor for any work required by the mechanical contractor.

C. Engineer: The consulting mechanical/electrical engineers either consulting to the owners, architects, other engineers, etc.

D. A-E: Shall construe architect and/or engineer. In all situations that involve an architect, it shall construe architect, in all others, engineer.

E. Furnish: Deliver to the site in good condition and turn over to contractor responsible for installation.

F. Provide: Furnish and install in complete working order.

G. Install: Install equipment furnished by others.

H. Indicated: Shown on the drawings or addenda thereto.

I. Contract Documents: All documents pertinent to the quality and quantity of work to be performed on the project. Includes but not limited to plans, specifications, instructions to bidders, general and special conditions, addenda, alternates, list of materials, list of sub-contractors, unit prices, shop drawings, field orders, change orders, cost breakdown, periodical payment requests, etc.

1.31 INTENT

A. It is the intention of these specifications and all associated drawings to call for finished work, tested and ready for operation. Wherever the word "provide" is used, it shall mean "furnish and install complete and ready for use".

B. Details not usually shown or specified, but necessary for the proper installation and operation of systems, equipment, materials, etc., shall be included in the work, the same as if herein specified or indicated.

1.32 DIGITAL DATA AND FILE TRANSMISSION

A. Sub-Contractors (SC) requiring digital files to prepare shop drawings and governmental agency submittals shall make their request through the Construction Manager (CM) or General Contractor (GC).

1. The CM/GC shall compile a list of requested drawings from the respective SC’s and submit one comprehensive list to STW.

2. STW will provide the CM/GC with a digital file transmission release form. The CM/GC may sign and return or have the requesting SC’s sign and return to STW through the CM/GC.

3. After receiving the signed release form, STW will provide one set of all requested digital files to the CM/GC to then distribute to the appropriate SC's.

4. STW will provide AutoCAD/dwg files.

   a. Revit/BIM models will not be provided to contractors. Projects completed using REVIT will be exported to AutoCAD prior to releasing.

B. The project architect is the owner/author of the floor plans and reflected ceiling plans.

1. The architect must approve the release of these plans before STW can release our respective drawings.

2. Requests for floor plans and/or reflected ceiling plans only shall be made directly to the architect.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

NOT APPLICABLE

END OF SECTION 22 01 00

SECTION 22 42 00 – PLUMBING FIXTURES AND EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Water Closets

B. Lavatories

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

C. Section 211000 - PLUMBING PIPING AND VALVES

1.3 ACTION SUBMITTALS

A. Shop Drawings: For each fixture.

1. Product Data: For each type of product.

a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

b. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

2. Include diagrams for power, signal, and control wiring where applicable.

1.4 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For each type of product and related components requiring maintenance. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: Provide in operation and maintenance manual the following when provided:

1. Flushometer valves and electronic sensors.

2. Lavatory, sink and shower faucets.

3. Electric water coolers.

1.5 GENERAL REQUIREMENTS

A. All plumbing fixtures and their installation shall conform to the requirements of the Kentucky State Plumbing Code.

B. Exposed metal work shall be bright chrome-plated brass except as noted.

C. All fixtures shall be by the same manufacturer.

D. All ADA accessible water closets provided with manual flush valve/trip lever shall have the flush valve handle/trip lever mounted on the wide(open) side of the water closet.

E. All drinking water system components that convey or dispense water for human consumption through drinking or cooking shall be “lead-free” in accordance with NSF/ANSI 61 and/or NSF/ANSI 372 standards and all state and local requirements.

F. Provide all plumbing fixtures complete with trim required and connect in a manner conforming to the state and local plumbing codes. Certain fixtures will be furnished by

others under other sections of these Specifications. Provide rough-in and final connections including all valves, traps, specialties, etc. required.

G. Provide traps for all waste connections where not furnished with the fixture and or equipment; unions; and stops or shut-off valves for all water connections to all sinks and other items of equipment as required. All exposed pipe and metal, including that within cabinets, shall be chrome plated brass.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Acorn, Amtecko, Aqua, American Standard, Bemis, Bradley, Briggs/Proflo, Chicago, Clarion Bathware, Church, Comfort Design, Compass, Component Hardware, Delany, Delta, Eljer, Elkay, Encon, Fiat, Florestone, Guardian, Haws, Intersan, Jay R. Smith, Just, Josam, Kohler, Lawler, Leonard, Metcraft, Moen, Murdock, Mustee, Oasis, Olsonite, Powers, PPP, Sioux Chief, Sloan, Speakman, Stearn-Williams, Stingray Systems, Symmons, T&S Brass, Taco, Toto, Willoughby, Wade, Watersaver, Watts and Zurn. SEE SCHEDULES ON DRAWINGS.

B. Products listed in schedule on drawings shall determine quality and grade required. If other than those listed in schedule are to be used, equivalent or parallel grade shall be used.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for potable, hot- and cold-water supply piping systems; soil, waste, and vent piping systems; and supports. Verify that locations and sizes of piping and locations and types of supports match those indicated, before installing and connecting fixtures. Use manufacturer's roughing-in data when roughing-in data are not indicated.

B. Examine walls, floors, and cabinets for suitable conditions where fixtures are to be installed.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PLUMBING FIXTURE INSTALLATION

A. Assemble plumbing fixtures and trim, fittings, faucets, and other components according to manufacturers' written instructions.

B. Install fixtures level and plumb according to manufacturers' written instructions, roughing-in drawings, and referenced standards.

C. Install floor-mounted, back-outlet water closets with fittings and gasket seals.

D. Install wall-hanging, back-outlet water closets with support manufacturer's tiling frame or setting gage.

E. Install toilet seats on water closets.

F. Install wall-hanging, back-outlet urinals with gasket seals.

G. Install flush valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for handicapped people to reach.

H. Fasten wall-hanging plumbing fixtures securely to supports attached to building substrate when supports are specified, and to building wall construction where no support is indicated.

I. Fasten recessed, wall-mounted fittings to reinforcement built into walls.

J. Fasten wall-mounted fittings to reinforcement built into walls.

K. Fasten counter-mounting plumbing fixtures to casework.

L. Secure supplies to supports or substrate within pipe space behind fixture.

M. Set shower receptors and mop basins in leveling bed of cement grout as specified by Architect.

N. Install individual stop valve in each water supply to fixture. Use gate or globe valve where specific stop valve is not specified.

O. Exception: Omit stop valves on supplies to emergency equipment, except when permitted by authorities having jurisdiction. When permitted, install valve chained and locked in OPEN position.

P. Install water-supply stop valves in accessible locations.

Q. Install faucet, laminar-flow fittings with specified flow rates and patterns in faucet spouts when faucets are not available with required rates and patterns. Include adapters when required.

R. Install supply, flow-control fittings with specified flow rates in fixture supplies at stop valves.

S. Install shower, flow-control fittings with specified maximum flow rates in shower arms.

T. Install traps on fixture outlets. Omit traps on fixtures having integral traps. Omit traps on indirect wastes, except where otherwise indicated.

U. Install disposers in sink outlets. Install switch where indicated, or in wall adjacent to sink if location is not indicated.

V. Install escutcheons at wall, floor, and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons where required to conceal protruding pipe fittings.

W. Seal joints between fixtures and walls, floors, and counters using sanitary-type, 1-part, mildew-resistant, silicone sealant. Coordinate this requirement with Architectural trades.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:

B. Install piping connections between plumbing fixtures and piping systems and plumbing equipment specified in other Division 22 Sections.

C. Supply and Waste Connections to Plumbing Fixtures: Refer to plumbing fixture schedules for fitting sizes and connection requirements for each plumbing fixture.

D. Supply and Waste Connections to Equipment Specified in Other Sections: Connect equipment with supply inlets, supply stops, supply risers, and traps specified in this Section. Use fitting sizes required to match connected equipment. Connect fittings to plumbing piping.

E. Arrange for electric-power connections to fixtures and devices that require power. Electric power is specified in Division 26 Sections and individual equipment sections.

3.4 FIELD QUALITY CONTROL

A. Verify that installed fixtures are categories and types specified for locations where installed.

B. Check that fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized and demonstrate proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

3.5 ADJUSTING AND CLEANING

A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.

B. Operate and adjust disposers, hot-water dispensers, and controls. Replace damaged and malfunctioning units and controls.

C. Adjust water pressure at drinking fountains, electric water coolers, faucets, shower valves, and flushometer valves having controls, to produce proper flow and stream.

D. Replace washers and seals of leaking and dripping faucets and stops.

E. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Include the following:

1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.

2. Remove sediment and debris from drains.

3.6 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of fixtures for temporary facilities, except when approved in writing by Owner.

END OF SECTION 22 42 00

SECTION 23 01 00 – GENERAL PROVISIONS FOR MECHANICAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers the general arrangement of the mechanical systems and related items to complete the work as shown on the drawings and as specified herein.

B. The General and Special Conditions and all other Contract Documents are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

C. The Contractor shall familiarize himself with the work of all other trades, general type construction and the relationship of his work to other sections. He shall examine all working drawings, specifications and conditions affecting his work. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, verify all dimensions in the field and advise the Engineer of any discrepancy before performing any work.

D. The work shall include complete testing of all equipment and piping at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment.

E. The Contractor shall perform all necessary temporary work during construction.

F. Work under this section shall conform to all governing codes, ordinances and regulations of the City, County and State.

G. The Contractor shall be responsible for all errors in fabrication, for the correct fitting, installation and erection of the various mechanical systems as shown on the drawings.

H. Any materials, labor, equipment, or services not mentioned specifically herein which may be necessary to complete any part of the MEP/FP systems in a substantial manner and in compliance with the requirements stated, implied, or intended in the Plans and/or Specifications, shall be included in the Bid as part of this Contract.

I. The Contractor shall hold harmless and indemnify the Engineer, Architect, employees, officers, agents and consultants from all claims, loss, damage, actions, causes of actions, expense and/or liability resulting from, brought for, or on account of any personal injury or property damage received or sustained by any person, persons, (including third parties), or any property growing out of, occurring, or attributable to any work performed under or related to this contract, resulting in whole or in part from the negligence of the Contractor, any Sub-Contractor, any employee, agent or representative.

1.2 SCOPE

A. This branch of the work includes coordination with all utility companies; agency review fees and all inspection fees; all labor, materials, tools, excavation and backfill and all equipment necessary for the installation of all Heating, Ventilating and Air Conditioning, System as shown on the Drawings and Specifications and/or as required for complete and operating systems. The work shall include starting, balancing, and the necessary and required tests to ensure the proper operation of the complete system.

B. All work for this project must comply and be in strict accordance with the Kentucky Building Code, Kentucky Plumbing Code, Kentucky Boiler Code, NFPA, ADA, NEC and all local codes and regulations.

C. In general (as a minimum) all materials and equipment must be installed in strict accordance with manufacturer's requirements; and provided with all required controls, internal fusing, relays, piping connections, electrical connections, ductwork connections, etc., to provide for complete and operable systems.

D. All equipment shall be manufactured within 24 months of bid date, no exceptions. Any equipment installed outside of this timeframe shall be removed and replaced to meet this requirement at no additional cost to the owner.

E. The Architect and Engineer do not define the scope of individual trades, Sub-Contractors, material suppliers and vendors. Any sheet numbering system or specification numbering system used which identifies disciplines is solely for the Architect and Engineer's convenience and is not intended to define a Sub-Contractor's scope of work. Information regarding individual trades, Sub-Contractors, material suppliers and vendors may be detailed, described, and indicated at different locations throughout the Contract Documents. No consideration will be given to requests for change orders for failure to obtain and review the complete set of Contract Documents when preparing Bids, prices, and quotations. Unless stated otherwise, the subdivision and assignment of work under the various sections shall be the responsibility of the Contractor holding the prime contract.

F. It is the responsibility of the bidder to completely review the Contract Documents. Any interpretation as to design intent or scope shall be provided by the Engineer / Architect. Should an interpretation be required, the bidder shall request clarification not less than ten (10) days prior to the submission of the proposal so that the condition may be clarified by Addendum. In the event of any conflict, discrepancy, or inconsistency, the interpretation of the Engineer shall be final.

G. The Contractor shall give written notice of any materials or apparatus believed inadequate or unsuitable; in violation of laws, ordinances, codes, rules, or regulations of authorities having jurisdiction; and any necessary items of work omitted a minimum of ten (10) days prior to bid. In the absence of such written notice and by the act of submitting a bid, it shall be understood that the Contractor has included the cost of all required items in the bid, and that will be responsible for the approved satisfactory functioning of the entire system without extra compensations.

1.3 DEFINITIONS AND ABBREVIATIONS

A. A-E: Shall construe architect and/or engineer. In all situations that involve an architect, it shall construe architect, in all others, engineer.

B. Bidder: Any person, agency or entity submitting a proposal to any person, agency, or entity for any part of the work required under this contract.

C. Contract Documents: All documents pertinent to the quality and quantity of work to be performed on the project. Includes but not limited to plans, specifications, instructions to bidders, general and special conditions, addenda, alternates, list of materials, list of sub-Contractors, unit prices, shop drawings, field orders, change orders, cost breakdown, periodical payment requests, etc.

D. Engineer: The consulting mechanical/electrical engineers either consulting to the owners, architects, other engineers, etc.

E. Furnish: Deliver to the site in good condition and turn over to Contractor responsible for installation.

F. Install: Install equipment furnished by others.

G. Indicated: Shown on the drawings or addenda thereto.

H. Mechanical Contractor: Any Contractor whether bidding or working independently or under the supervision of a General Contractor and/or Construction Manager, and who installs any type of mechanical work.

I. Mechanical Sub-Contractor: Any Contractor contracted to or employed by the mechanical Contractor for any work required by the mechanical Contractor.

J. Prime Contractor: The General Contractor (GC) or Construction Manager (CM).

K. Project: All of the work required under this Contract.

L. Provide: Furnish and install in complete, tested and in working order.

M. System: A term capturing the entire composition of equipment and appurtenances required for a complete, operational, “turnkey” product (i.e. – a geothermal heat pump “system” refers to all heat pumps, ductwork and air devices, piping, well field, make-up water, water fill, chemical feed, hydronic pumps and associated VFDs, electrical wiring and connections, temperature controls and associated wiring, etc.).

N. Typical (TYP): Where indicated repeat this work, method or means each time the same or similar condition occurs whether indicated or not.

O. ADA - Americans with Disabilities Act

P. AGA - American Gas Association

Q. AMCA - Air Moving and Conditioning Association

R. ANSI - American National Standards Institute

S. ARI - Air Conditioning & Refrigeration Institute

T. ASME - American Society of Mechanical Engineers

U. ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers

V. ASTM - American Society of Testing Materials

W. AWWA - American Water Works Association

X. AWS - American Welding Society

Y. BOCA - Building Officials & Code Administrators International, Inc.

Z. CM - Construction Manager

AA. DOE - U.S. Department of Energy

BB. EPA - Environmental Protection Agency

CC. FM - Factory Mutual

DD. GC - General Contractor

EE. HBC - Housing, Building and Construction

FF. IBC - International Building Code

GG. IECC - International Energy Conservation Code

HH. IMC - International Mechanical Code

II. MEP/FP - Mechanical, Electrical, Plumbing / Fire Protection

JJ. NFPA - National Fire Protection Association

KK. NEC - National Electrical Code

LL. NEMA - National Electrical Manufacturer's Association

MM. OSHA - Occupational Safety and Health Administration

NN. SC - Sub-Contractor

OO. SMACNA - Sheet Metal and Air Conditioning Contractors National Association

PP. STW - Shrout Tate Wilson Consulting Engineers

QQ. UL - Underwriter's Laboratories, Inc.

1.4 QUALIFICATIONS

A. All Mechanical Contractors and their Sub-Contractors bidding this project must have been a licensed company for a minimum of three (3) years. Experience of any one individual employee does not supersede this requirement.

B. All mechanical Sub-Contractors bidding the mechanical work must have completed one project of 75% this subcontract cost size and two projects of 50% this subcontract cost size.

C. All mechanical work shall be performed by qualified workers who are competent in the area of work for which they are responsible. Any workers not meeting this requirement, as evidenced by their workmanship, shall be summarily relieved of their responsibilities. The Engineer shall reserve the right to determine the quality of workmanship of any workers and unqualified or incompetent workers shall refrain from work in areas not deemed satisfactory. Requests for relief of workers shall be made through the normal channels of Architect, Contractor, etc.

D. The Contractor shall be licensed in the State which the work is to be performed. All work shall be performed by licensed Master HVAC Contractors and Master / Journeymen Plumbers.

E. All control systems shall be installed by workers normally engaged or employed in this type of work.

F. Specialized systems such as medical gases, automatic sprinkler systems, etc. shall be installed only by workers who are licensed and normally engaged in such services.

G. All electrical work shall be accomplished by Licensed Journeymen electricians under the direct supervision of a licensed Electrician. All applicable codes, utility company regulations, laws and permitting authority of the locality shall be fully complied with by the Contractor.

1.5 PERMITS, FEES, CODES AND APPROVALS

A. Permits and Fees

1. All permits, tap on fees and agency review and inspection fees necessary for the complete HVAC, system shall be obtained by the Contractor from the authorities governing such work. The cost of all permits shall be borne by the Contractor.

B. Codes

1. The minimum standard for all mechanical work shall be the current requirements of the Kentucky State Plumbing Law, Regulation and Code, Kentucky Building Code, ADA, International Mechanical Code, Kentucky Boiler Code, NFPA and local ordinances.

C. Approvals

1. All work must be approved by the Architect/Engineer, Owner and all related Code Agencies before final payment will be made.

2. As a minimum, the following approval Certificates of Inspection and Approval shall be required:

a. HVAC Inspection

b. Local and State Building Inspections.

3. Final payment will be contingent upon all Approval Certificates.

1.6 DRAWINGS AND SPECIFICATIONS

A. Contract drawings for work under this section are in part diagrammatic, intended to convey the scope of work and indicate the general arrangement of equipment, piping and the approximate size and location of equipment and outlets. The Contractor shall follow these drawings in laying out his work and shall verify spaces in which his work will be installed, indicating to the Engineer where any conflicts or overlapping of systems occur. Any item of work not clearly included, specified and/or shown, errors or conflict between Plans (Mechanical, Architectural, Structural or Electrical), Specifications, codes and field conditions, shall be clarified by a written request to the Architect by the Bidder before bidding; otherwise, the bidder shall, at his own expense, supply the proper labor and materials to include these items of work and to make good any damages or defects in his work caused by such error, omission or conflict. Under no circumstances shall a Contractor scale the Drawings for the location of equipment and work.

B. In the event there is a conflict within the Contract Documents, the Contractor shall notify the Engineer immediately. If a clarification is not given, the Contractor shall bid the more stringent of the two requirements.

C. Should conflict, overlap or duplication of work between the various trades become evident, this shall be called to the attention of the Engineer. Neither trade shall assume to be relieved of the work which is specified under their branch until instructions in writing are received from the Engineer.

D. Where job conditions require reasonable changes in indicated locations and arrangement, proposed departures shall be submitted with detailed drawings to the Engineer for approval before any of the proposed work is commenced. All approved departures shall be made at no additional cost to the Owner.

E. The drawings and the specifications are intended to indicate complete and working systems, unless specifically indicated to the contrary. The work includes the furnishing, installing, and connecting of a complete working installation in each case to the full extent set forth in the drawings and herein specified. The Contractor shall be responsible for the complete functioning system, unless specifically noted otherwise.

F. The drawings and specifications constitute the Contract Documents and shall be considered as cooperative. Work and material included in either, though not mentioned in both, shall be a part of the work to be accomplished and shall be carried out completely in as thorough manner as if covered by both. All items shown on the drawings and/or listed in the specifications shall be provided and installed by the Contractor unless specifically noted that it will be provided and/or installed by others. In the event there is a conflict within the Contract Documents, the Contractor shall notify the Engineer immediately. If a clarification is not given, the Contractor shall bid the more stringent of the two requirements.

G. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and accessories that may be required. The Contractor shall carefully investigate the structural and finish conditions affecting all his work and shall arrange such work, accordingly, furnishing such fittings, pipe, traps, valves, and accessories as may be required to make a functional installation at no additional cost to the Owner.

H. Mechanical as built "Record Drawings" shall be kept up to date each day. "Record Drawings" shall be reviewed by Architect/Engineer each month with Contractor's pay request review.

I. Any deviation in work as shown on plans and specifications must be approved in writing by Architect/Engineer prior to installation.

J. Each Contractor shall refer to the Architectural and Structural Drawings and Specifications for the general construction of the building, for floor and ceiling heights, for

location of walls, partitions, beams etc., and shall be guided accordingly for the setting of all sleeves and equipment.

K. Under no circumstances shall a Contractor scale the Drawings for the locations of equipment and work.

1.7 EQUIPMENT DESIGN AND INSTALLATION

A. The design, manufacture, testing and method of installation of all apparatus and materials furnished under the requirements of these specifications shall conform to the applicable standard rules of the following. Where materials are not specifically referred to, but are required, they shall meet the requirements of the applicable code.

B. Unless otherwise specified, equipment and materials of the same type and used for the same purpose, shall be products of the same manufacturer.

C. Each Contractor shall demand and examine all Drawings and Specifications pertaining to the construction before installing the work described and shown under these Drawings and Specifications. Each Contractor shall cooperate with all other Contractors in locating piping, openings, chases, and equipment in order to avoid conflict with any other Contractor's work. It is the responsibility of all trades to examine all shop drawings of other trades that would require equipment to occupy the same space and plane within the building to eliminate any potential conflicts. No extra payment will be allowed for relocation of piping, and equipment not installed in accordance with the above instructions, and which interferes with work and equipment of other Contractors.

D. All appliances, materials and equipment shall be installed and connected in accordance with the best engineering practice and in accordance with the manufacturer’s instructions and recommendations. All auxiliary piping, special controls, water seals, valves, electrical connections, drains, etc., recommended by the manufacturer, required for proper operation, or required by code shall be furnished and installed complete.

E. All equipment designed and constructed for indoor use shall not be shipped to the site until such time that the equipment is ready for permanent installation in a dry building or may be stored on site provided equipment is stored in a water and moisture tight storage building or job trailer. Covering equipment outdoors with plastic or tarp is not acceptable.

F. All materials and equipment so indicated and all equipment and materials for the electrical portion of the mechanical systems shall bear the approval label of or shall be listed by the Underwriters' Laboratories (UL), Incorporated. Each packaged assembly shall be approved as a package. Approval of components of a package shall not be acceptable.

G. All Contractors shall familiarize themselves with the entire set of contract documents. Specifically, but not limited to ceiling heights specified on Architectural Plans. Where the location of equipment or systems may interfere with ceiling heights or maintenance and access of equipment or systems, the Contractor shall call this to the attention of the Engineer in writing prior to making the installation. Do not install equipment or systems in the affected area until the conflict is resolved. Any such changes shall be anticipated and requested sufficiently in advance to prevent extra work or cost incurred on the part of the Contractor or unduly delay the work.

H. When any Contractor requests approval of materials and/or equipment of different physical size, weight, capacity, function, color, access, that the design allows for it shall be understood that such substitution, if approved, will be made without additional cost to anyone other than the Contractor requesting the change regardless of changes in connections, space requirements, electrical characteristics, etc. from that indicated. In all cases where substitutions affect other trades, the Contractor requesting such substitutions shall advise all such Contractors of the change and shall compensate them for all necessary changes in their work. Any Plans, Specifications, Diagrams, etc., required to describe and coordinate such substitutions or deviations shall be

professionally prepared at the responsible Contractor’s expense. Review of Shop Drawings by the Engineer does not in any way absolve the Contractor of this responsibility.

I. Coordinate kitchen equipment selection by the General Contractor prior to Bid. Any deviations and/or conflicts for any kitchen equipment shall be the Contractor’s responsibility.

J. The Contractor's work lines, and established heights shall be in strict accordance with drawings and specifications insofar as these drawings and specifications extend. The Contractor shall verify all dimensions shown and establish all elevations and detail dimensions not shown. The Contractor shall also correlate the time so that the work will proceed to the best advantage of the complete job as a unit. The Contractor shall be responsible for furnishing in ample time, any information required to revise footing elevations, build all chases and openings in floors, walls, partitions, ceilings, and roofs to provide clearance which may be required to accommodate the work. The Contractor shall set all sleeves, anchor bolts and inserts required to accommodate his equipment before masonry is constructed.

K. The Contractor shall layout his work well enough in advance to foresee any conflicts or interferences with work of other sections so that in case of interference, his layout may be altered to suit the conditions, prior to the installation of any work. This procedure will require constant coordination with all sections of the work.

1.8 STRUCTURAL DRAWINGS AND SPECIFICATIONS

A. Each Contractor shall refer to the Structural Drawings and Specifications for the general construction of the building, for floor and ceiling heights, for location of walls, partitions, beams, grade beams, foundations, footings etc., and shall be guided accordingly for the setting of all sleeves and equipment.

B. Under no circumstances shall a Contractor scale the Drawings for the locations of equipment and work.

C. The contractor is responsible for reviewing all below slab / underground piping with structural components and coordinating all stepped footings or sleeves where required.

1.9 CAPACITIES, SIZES AND OPERATING CONDITIONS

A. Capacities, sizes, and conditions specified or shown on drawings shall be regarded as minimum allowable. If the Contractor proposes to furnish any equipment which would have to operate at other than specified conditions to produce final effects, all other directly or indirectly related components of the entire systems (as well as of the structure, finish, and other systems in the building) must be properly coordinated to the satisfaction of the Engineer. That is: Operating conditions through the entire system must be such that no motor is overloaded, no equipment operates noisier, faster, or hotter than manufacturer’s publication recommends and that no excess stress or demand is imposed on any component of any system or the structure; also, that no quality, architectural feature, function or "end result" is affected adversely, in the opinion of the Architect.

B. The Architect/Engineer reserves the right to determine if the Contractor's proposed materials and equipment of any one manufacturer is acceptable in lieu of the specified material or equipment.

C. Where materials and equipment are listed on Drawings and specifications as acceptable or equivalent, this does not relieve the Contractor and/or manufacturer from providing and proving to Architect/Engineer that their materials and equipment are equivalent to items the Architect/Engineer used as a guide specification.

D. The Contractor and manufacturer must confirm to the Architect/Engineer that their equipment and materials will meet the space requirements of the project and that the equipment is easily accessible for maintenance and operation.

1.10 ACCESSIBILITY

A. All equipment, valves, motors, damper operators, traps, unions, and all other items which require adjustment, maintenance, repair, and observation shall be installed in such a fashion that such maintenance, repair, and observation can be readily achieved without undue difficulty. Where the drawings show these items in locations not conforming to the above, the Contractor shall advise the Architect/Engineer of this conflict prior to bid Date otherwise he shall, at his own expense, relocate such items as directed by the Architect/Engineer. Where such items are installed above inaccessible ceilings or in or behind walls, this Contractor shall provide approved access panels unless otherwise directed in these Specifications.

1.11 SUBMITTALS

A. Review of Materials and Equipment: Within 30 days of receipt of notice to proceed, and before starting installation, the Contractor shall submit to the Architect for review, electronically (PDF format), lists of materials, fixtures, and equipment to be incorporated in the work. If departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including changes in related portions of the project and the reasons therefore shall be submitted with drawings. Where such departures require piping or equipment to be supported otherwise than shown, the details submitted shall include loadings and type and kinds of frames, brackets, stanchions, or other supports necessary. Any departures shall be made at no additional cost to the Owner. The lists of materials and equipment shall be supported by sufficient descriptive material, such as catalog cuts, diagrams, and other data published by the manufacturer, as well as evidence of compliance with safety and performance standards, to demonstrate conformance to the specification requirements; catalog numbers alone will not be acceptable.

B. Conformance to Agency Requirements: Where materials or equipment are specified to be constructed and/or tested in accordance with the standards of the American Society of Mechanical Engineers, the Air Moving and Conditioning Association, or the American Society of Heating, Refrigerating and Air Conditioning Engineers, or to be approved by the Underwriters' Laboratories, Inc., the Contractor shall submit proof that the items furnished under this specification conform to such requirements. A certificate or published statement by the manufacturer will be sufficient evidence that the item conforms to the specified requirements. In lieu of such stamp, certificate, or statement, the Contractor may submit written certificate from any nationally recognized testing agency adequately equipped and competent to perform such services, stating that the items have been tested and that the units conform to the requirements listed hereinbefore, including methods of testing, of the specified agencies.

C. Shop Drawings

1. The review of shop drawings by the Engineer applies only to conformance with the design concept of the project and general compliance with the information given in the Contract Documents. In all cases, the Contractor alone shall be responsible for furnishing the proper quantity of equipment and/or materials required, all applicable codes and regulation are met, all equipment fits the available space in a satisfactory manner and that piping, electrical and all other connections are suitably located.

2. In accordance with the General Conditions, shop drawings shall be submitted on all units of prefabricated materials. Shop drawings shall show, in detail, all parts of the work, fully dimensioned and shall also indicate construction, concealed and other jointing, thickness of materials, method of anchoring and attachment to other materials. Where required for certain work, submit setting and bending diagrams and mark same to correspond with the design drawings, identifying

locations of various items. Show types, sizes and locations of sleeves and inserts.

3. Each shop drawing and/or manufacturers descriptive literature shall have the proper notation indicated with all accessories and features and shall be clearly referenced to the specifications and equipment schedules.

4. Both the Contractor and Prime Contractor shall check all shop drawings for completeness and for correctness before submitting the drawings to the Engineer. If major corrections are required on the drawings, the Contractor shall return the drawings to the originator and have the changes made. The Contractor shall indicate his corrections on the prints in green pencil and sign all prints and other material sent to the Engineer.

5. The Mechanical Contractor shall be responsible for final coordination of all electrical requirements (voltage, phase, circuit breaker sizes, wire sizing, etc.) with the Electrical Contractor prior to ordering any equipment or materials. There will be no change in the Contract Amount for any discrepancies.

6. Detail and Erection Drawings: Detail and erection drawings for equipment, piping and other items of this nature shall be carefully prepared in accord with standard practice and shall show erection plans and member details with all individual parts identified on both the detail sheets and erection plans. All identification markings shall be carefully preserved until after the erection process is completed.

7. Material Data: The Contractor shall submit descriptive data, as required, on pipe, fittings, and valves to be incorporated into the work. This data shall be in sufficient detail to allow the Engineer to determine that the pipe, fittings, and valves meet the requirements of the contract drawings and specifications or that they are an acceptable equal to that specified. All data shall be in the form of manufacturer's or supplier's literature concerning the product and shall indicate catalog number, conditions of use, application instructions, and/or other information as applicable.

8. Equipment Data: The Contractor shall submit descriptive data on all items of equipment to be furnished and installed under this contract. These submittals shall consist of manufacturer's published catalog information which completely describes component materials, configuration and rough-in data for mechanical and electrical equipment shall also include cuts, diagrams, characteristic curves, and capacity information as applicable. Where more than one item of equipment is employed in the same system, the submittal of equipment data will include special diagrams showing the electrical wiring, interconnecting piping, related controls and relation and operation of the various items of equipment for the entire system.

D. Materials, Equipment and Appliances

1. Materials: All materials, equipment, products, and incidentals to be furnished by the Contractor shall be new, unless otherwise specified, undamaged and the first line quality product of the manufacturer and/or supplier, except when competitive grades fully meet the standards specified in the various technical sections of these specifications.

2. Standard Products: Except as otherwise approved by the Engineer, the equipment, and appliances to be furnished under these specifications shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design. Where two or more units of the same type and class of equipment are required, the units shall be the product of the same manufacturer and shall be identical insofar as

possible. The component parts of the products need not be products of one manufacturer.

3. Manufacturer's Directions: Where manufacturer's instructions or recommendations are applicable to the installation or application of materials, the Contractor shall adhere to strict conformance with such instructions or recommendations unless specifically noted to the contrary in these specifications. Where such directions are in conflict with the drawings and specifications, the Contractor shall inform the Engineer of such conflict and request instructions.

4. Samples: The Contractor shall furnish, for approval, samples of materials, profiles, designs, finishes, etc., which are either required by the various sections of specifications or which the Engineer may request from time to time. Samples shall be clearly identified with adequate information for the Engineer's evaluation.

5. Materials and Equipment Delivered to Jobsite: All items of materials, equipment, supplies and miscellaneous items to be incorporated into the work shall be delivered to the jobsite with labels, tags, nameplates and/or containers which clearly indicate the manufacturer's item or catalog number or conformance with the applicable standards stipulated in the technical sections of the specifications. Any item which cannot be verified in the field shall not be included in the work until its identity can be established by the Engineer.

E. Equipment and Material Substitutions

1. Should the Contractor elect to use and install materials which have been approved for use other than specified, he shall be required to make any necessary changes, perform all work, and furnish any additional materials and ancillary equipment required to make such substituted materials or equipment function or perform as that specified, at no cost to the Owner. This includes structural, electrical and/or other affected trades.

1.12 PROTECTION OF EQUIPMENT AND MATERIALS

A. No piping shall be installed in any part of the building where danger of freezing may exist without adequate protection being given, whether or not insulation is specified for the particular piping. All damage resulting from leaking pipes shall be borne by the Contractor under this Division. Do not install piping across or near openings to the outside whether or not they are carrying static or moving fluids. Insulation on piping does not ensure that freezing will not occur. The Contractor shall contact the Engineer when in doubt.

B. All work, equipment and materials shall be protected at all times. All pipe and ductwork openings shall be closed with caps or plugs during construction. All equipment and accessories shall be tightly covered and protected against dirt, water, or other injury during the period of construction.

C. If the permanent HVAC equipment is used during the construction period for temporary heating, cooling, and ventilating, the equipment must be carefully protected, and filters changes at minimum of once a week. All return air and exhaust air ductwork used in temporary HVAC systems during construction period must be filtered at each opening to prevent construction dust from entering the ductwork system. Use of any permanent systems does not alter or prematurely begin the warranty period.

1.13 EXAMINATION OF SITE

A. Bidders shall visit the site before submitting proposals to satisfy themselves as to the nature and scope of the work and any difficulties attending to the execution.

B. The submission of a proposal will be construed as evidence that such an examination has been made. Later claims for labor, equipment, materials, etc., required for difficulties

encountered which could have been foreseen had such an examination been made, will not be recognized.

1.14 EXISTING CONDITIONS

A. The locations of all piping, conduits, cables, utilities, and manholes existing, or otherwise, that comes within the contract construction site, shall be subject to continuous uninterrupted service with no other exception than the Owner of the utilities permission to interrupt same temporarily. Provide a seven (7) day written notice to Engineer, Architect and Owner prior to interrupting any utility service or line.

B. Known utilities and lines as available to the Engineer are shown on the Plans. However, it is additionally required that, prior to any excavation being performed, each Contractor ascertains and marks all utilities or lines that would be endangered by the excavation. Hand dig if required to locate. Contractor shall bear costs of repairing damaged utilities.

C. If utilities or lines occur in the earth within the construction site, the Contractor shall probe and locate the lines prior to machine excavation in the respective area. Hand dig if required to locate.

D. Cutting into existing utilities and services shall be performed in coordination with and as designated by the Owner of the utility. The Contractor shall work continuously to restore service(s) upon deliberate or accidental interruption, providing premium time and materials as needed without extra claim to the Owner.

E. The Contractor shall repair to the satisfaction of the Owner and Engineer any surfaces or subsurface improvements damaged during the course of the work, unless such improvement is shown to be abandoned or removed.

F. Machine excavation shall not be permitted with ten feet of gas lines, fuel lines, electrical lines or lines carrying combustible and/or explosive materials. Hand excavate only in accord with utility company, agency or other applicable laws, standards, or regulations.

G. Protect all new or existing lines from damage by traffic, etc. during construction. Repair or replacement of such damage shall be at the sole expense of the party responsible.

H. Protect existing trees, indicated to remain with fencing or other approved method. Hold all new subsurface lines outside the drip line of trees, offsetting as necessary to protect root structures. Refer to planting or landscaping plans, or in their absence, consult with the Architect.

1.15 DEMOLITION AND SCHEDULE

A. All existing mechanical equipment noted on drawings and listed herein that is to be removed or demolished, shall be removed on schedule, and disposed of as hereinafter directed.

B. All items removed shall become the property of the Contractor and shall be immediately disposed of off-site at Contractor’s expense except as noted on drawings unless otherwise directed by owner.

C. All demolition shall be carefully accomplished in accordance with the master construction schedule so as not to remove any item required for support operation during the planned schedule. No item shall be removed until full schedule is worked out with Contractors according to owner’s demands and agreed to in writing by the Engineer.

D. Storage will be arranged during the scheduling process. Contractors to provide their own storage and security.

E. Contractor performing the demolition of equipment must conform to the Clean Air Act of 1990. Refrigerant must be recovered from any air conditioning or refrigeration equipment prior to disconnecting and disposal. The Contractor must own and use recovery

equipment to meet this requirement. The Contractor shall be responsible for the disposal of refrigerant, refrigerant oil, or equipment.

F. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damage or unserviceable portion and replace with new products of equal capacity and quality. All existing piping to remain shall be permanently capped, new or existing valves are not adequate.

1.16 CUTTING AND PATCHING

A. All cutting and patching required in connection with the installation of this work, and work due to errors, defective work, ill-timed work, or tardiness in properly designating size and location in sufficient time or by failure to notify other trades, shall be done under this section, but only in the manner directed by the Engineer so as to prevent or minimize damage to installed work. Damage as a result of cutting for installation, shall be repaired by mechanics skilled in the trade involved, at no additional expense to the Owner.

B. No cutting of structural members will be permitted, except when prior permission of the Engineer has been obtained. This work must conform in every respect to the surrounding finish and to the quality of workmanship and materials used.

C. Piercing of any waterproofing or roofing shall be done only by the trade involved. After the part piercing the waterproofing has been set in place, the opening made for this purpose shall be filled and made absolutely watertight to the satisfaction of the Engineer.

D. See Section: 230517 - SLEEVING, CUTTING, PATCHING AND REPAIRING - MECHANICAL

1.17 FIRE AND SMOKE-STOPPING

A. Fire-stopping and smoke-stopping shall be provided around all piping and ductwork penetrations of fire rated and/or smoke-rated floors, walls, ceilings, or other barriers.

B. The materials used shall be UL 263 or UL 1479 classified and meet ASTM E814 standards and be rated for assemblies where applied.

C. Clean surfaces to be in contact with penetration seal materials, of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance.

D. Install penetration seal materials in accordance with manufacturer's instruction.

E. Seal holes or voids may be penetrations to ensure an effective fire and/or smoke barrier.

F. Protect materials from damage on surfaces subject to traffic.

G. Stop insulation flush with wall on insulated pipe and seal edges.

H. All exposed piping passing through floors, ceilings and walls in finished areas shall be fitted with a chrome plated escutcheon of sufficient outside diameter to amply cover the sleeved opening and ad inside diameter to closely fit the pipe around which it is installed.

I. Galvanized sheet metal collars shall be provided around all ducts, equipment, etc., exposed in finished areas. Where such openings are finished and the space around the unit is small, the collar may be omitted with the approval of the Architect.

1.18 CONCRETE WORK AND ANCHOR BOLTS

A. The Contractor under this Division shall provide all concrete bases, curbs and pads for all floor and ground mounted equipment unless otherwise indicated.

B. The Contractor under this Division shall verify the sizes and locations of all supports, bases, and pads prior to pouring of same to be certain that the installed units will be compatible.

C. The Contractor under this Division shall set anchor bolts when required for the equipment prior to pouring concrete. Sizes and exact locations of bolts shall be determined by the manufacturer's recommendations for the equipment served.

D. Concrete work must be provided in strict accordance with Section 03 Concrete Work. As a minimum provide pads using 3500 psi concrete not less than 3.5 inches high reinforced with WI.4 x WI.4 welded wire fabric. Chamfer top and edge corners with 3/4" preformed chamfer strips. Subbases shall rest on structural floor and shall be reinforced with steel rods and interconnected with floor reinforcing bars by tie bars hooked at both ends or suitable dowels. Slope top to floor drain if drain is provided in pad.

1.19 ELECTRIC MOTORS

A. All motors shall be designed, tested, and applied in accordance with the applicable standards listed hereinbefore. Motors shall be of sufficient size for the duty to be performed and shall not exceed the full load rating when the driven equipment is operating at specified capacity. Unless otherwise specified, all motors shall be high efficiency type and shall have open frames and continuous-duty classification based on 50 degrees C. ambient temperature. Polyphase motors shall be squirrel-cage type, having normal-starting-torque and low-starting-current characteristics. Motors shall meet NEMA high efficiency standards MGI - 1.41.2 for energy efficient polyphase squirrel-cage motor. Efficiency shall be in accordance with MGI - 1.2.55. When motor horse powers required differ from those indicated on the drawings, the Contractor shall make the necessary adjustments to the wiring, disconnect devices, starters, and branch-circuit protection at no additional cost to the Owner.

1. Motors shall be rated for continuous duty capable of driving the connected loads without exceeding temperature limitations of the motor insulation. Special Class A moisture-resisting insulation (designed to operate in a 122-degree F. ambient without exceeding a temperature rise rating designated by NEMA for the type of enclosure used) shall be utilized in each motor.

B. Unless otherwise indicated or specified, the electrical components required to operate mechanical equipment, such as, motors, float and pressure switches, solenoid valves, and other devices functioning to control the mechanical equipment, shall be furnished as part of the mechanical equipment, shall be complete and operable, and shall be included under this section of the specifications. All motor starters not part of a motor control center shall be included under this Section and shall be the hand off auto type with 3 over-loads on 3 phase units and 120V control transformer. Conduit and wires required for external electrical connections shall be furnished and are specified under DIVISION 26 - ELECTRICAL. Integral phase failure relay shall be provided as a part of all three phase motor starters. Relay shall shut motor down on phase loss or phase unbalance and automatically reset when normal phasing is restored. Phase failure relay shall have adjustable restart time capabilities. Mechanical Contractor shall coordinate staggered restart times as required.

1.20 DRIVES

A. Each belt-connected motor-driven unit or fan shall be provided with a variable pitch V-belt drive.

B. Sheaves shall be of cast iron or of steel, statically and dynamically balanced, bored to fit properly on the shafts and secured with key of proper size. Sheaves having set screws alone will not be permitted. Sheaves shall be variable pitched and shall be designed to give the required rpm at approximately the mid-position of adjustment. Pitch diameters of sheaves shall be not less than 3.0 inches for "A" section belts; 5.4 inches for "B" section belts; 9.0 inches for "C" section belts; and 13.0 inches for "D" section belts.

C. Belts shall be selected for a minimum service factor of 1.5 (based on motor nameplate horsepower) and selected and matched in sets for equal tension.

D. All other drives shall be as described under the respective equipment paragraph of these Specifications, as applicable.

1.21 ACCESS PANELS

A. The Mechanical Contractor shall furnish all other access panels needed for access to valves, open receptacles, vents, fire dampers, mechanical units, etc., in inaccessible locations installed under this Division of the work.

B. Access panels shall have a minimum size of 12" x 12" and shall be centered beneath equipment for accessibility and maintenance. Access panels must be of adequate size to service, observe, remove, and maintain equipment.

C. Access panels shall be equal to the types specified under the Architectural Specifications. As a minimum the access panels shall be equivalent to Acudor Products, Cendrex, Inc., MIFAB, Inc., Lane-Aire Manufacturing, 14 gauge with vandal proof lock and frame as selected by Architect. Access panels shall be fire rated when installed in fire rated construction.

D. Access panels shall have a primed white finish.

E. Ceiling Types

1. In areas with suspended acoustical tile ceilings (installed on exposed metal grid suspension system so that the tile may be readily removed), equipment, valves, etc., installed above these ceilings will be considered accessible.

2. All plastered ceilings or ceilings having concealed spline type of suspension system will be considered as not removable for accessibility to equipment; therefore, access panels will be required.

3. See Architectural Drawings and Specifications for the types of ceilings throughout the building.

F. Access panels shall be installed by sub-Contractor specialized in access panel installation.

1.22 CONNECTION TO EQUIPMENT SPECIFIED IN OTHER SECTIONS

A. Examine all Contract Documents and be thoroughly familiar with all items of equipment in other sections or by Owner, unless otherwise specified or indicated on Drawings. Rough-in for and make final connections to all equipment which requires any of the services specified in this Section and including furnishing and install all valves, P-traps, unions, vacuum breakers, and all other specialties as required to make all work and equipment final and operating. It is the intent of the Contract Drawings to detail and indicate all such equipment; however, be responsible for notifying Architect/Engineer in writing of major discrepancies seven (7) days prior to Bid Date; otherwise, all such connections shall be made at no extra cost. The Contractor shall finally connect mechanical services (water, sanitary, gas, air, etc.), to any terminal equipment, appliances, kitchen equipment, etc., provided under this and/or other divisions of the work. Various equipment connections indicated are based upon “basis of design” equipment selections. Should alternate equipment be purchased, then this Contractor shall make the necessary provisions in the Bid for any and all differences. Change Orders shall not be considered for any differences due to alternate equipment purchase. Such connections shall be made in strict accord with current codes, safety regulations and the equipment manufacturer’s recommendations. If in doubt, contact the Engineer prior to installation.

B. Unless specified otherwise, all conduit, wiring and connections for power to mechanical equipment will be provided by Electrical Contractor. The Mechanical Contractor shall be responsible for correcting sequences of operation of all mechanical equipment after all wiring has been completed.

1.23 SAFETY

A. The Contractor and his Sub-Contractors for the project shall comply with all applicable Federal, State, and local laws governing safeguards, safety devices, and protective equipment and shall take all other needed actions which they may determine or which the Department may determine to be reasonably necessary to protect the life and health of all employees and personnel on the project, provide for the safety of the public and protect all property affected by the performance of the work covered by the contract.

B. As provided in KRS Chapter 338 in the Kentucky Occupational Safety and Health Act and in subsequent regulations and standards promulgated by the Kentucky Occupational Safety and Health Standards Board, neither the Contractor nor his Sub-Contractors shall require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety.

C. The Contractor shall not remove or disturb any suspected hazardous materials, including asbestos-containing materials, lead-based paints, electrical equipment containing PCBs, or any other except as instructed in this contract. If any material not covered by the contract is encountered, notify the Engineer immediately.

D. All belts, pulleys, chains, gears, couplings, projecting setscrews, keys and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded.

1.24 OPERATING INSTRUCTIONS / START-UP

A. After all tests have been completed and work accepted by the Owner, a competent representative shall, at a time determined by the Engineer, present verbal, and visual instructions to the Owner's personnel in the proper operation of his respective system. For this purpose, each section of work shall be demonstrated and explained to the Owner's personnel and sufficient time allotted for instructions.

B. The Contractor shall include in their bid to provide equipment and controls startup and verification for all mechanical systems specified for this project.

C. A pre-start-up conference shall be held with the Architect, Engineer, Owner, General Contractor, Mechanical Contractor, Electrical Contractor, Controls Contractor, Test and Balance Contractor, Commissioning Agent (where applicable), and the Manufacturer’s providing startup services. The purpose of this meeting will be to discuss the goals, procedures, etc. for start-up.

D. Specific startup/verification specifications are included throughout the Mechanical Specifications. In general, as part of the verification process, equipment suppliers shall perform start-up by their factory authorized technicians, not third-party Contractors, and shall complete and submit start-up reports/checklists. The Contractor shall have appropriate trades on site to correct all deficiencies noted by the factory representative. For each deficiency noted, documentation of corrective action (including date and time) shall be submitted to the Engineer and Owner. Where factory start-up is not specified for a particular piece of equipment or system, the Contractor shall be responsible for performing start-up. All information shall be completed by the Contractor and submitted to the Owner/Engineer prior to acceptance of the equipment.

E. Except for the specific equipment specified in this Specification Section, the manufacturer’s recommended startup procedures and checklists will be acceptable for use in the project. Where “manufacturer” startup is not specified, then this Contractor shall perform startup services in strict accordance with manufacturer’s instructions. All startup/verification process shall be thoroughly documented by the Contractor and shall include the time and date when performed.

F. The Contractor shall “zip-tie” a start-up report to each piece of equipment in a clear plastic cover. Once start-up completion is verified by the Engineer the Contractor shall remove all reports and consolidate them into close-out documentation. The Contractor

shall be responsible for completion of System Verification Checklist (SVC) / Manufacturer's Checklists.

1.25 TESTS

A. All tests required to establish the adequacy, quality, safety, completed status and suitable operation of each system and all components thereof shall be made in the presence of and to the satisfaction of the Engineer or his authorized representative and other representatives of State and local Government. All instruments, labor, and expert service necessary to conduct these tests shall be supplied by the Contractor; power and fuel will be furnished by the Owner.

B. The final inspection and tests are to be made only after the Engineer is satisfied that the work described in these specifications has been completely installed in accordance with the true spirit and intent of these specifications and that complete preliminary tests were made which indicate adequacy, quality, completion, and satisfactory operation. The acceptance of the work herein specified shall not in any way prejudice the Owner's right to demand replacement of defective material and/or workmanship.

C. The Architect/Engineer shall be notified by the Contractor under this Division forty-eight (48) hours in advance of any tests so that the Architect/Engineer or his representative may be present when the tests are run. Leaks or imperfections found shall be corrected and a new test shall be run to the satisfaction of the Architect/Engineer. Upon successful completion of the test, pipe covering may be applied, and piping may be concealed. A successful test, even if witnessed, however, does not relieve the Contractor under this Division of the responsibility for any failure during the guarantee period.

D. After pipe fabrication has been completed, all water piping shall be subjected to a hydrostatic test of 100 psi and proven tight and free of leaks for a 24-hour period. Tests shall be applied to the piping before being attached to any equipment which would be damaged by the test pressure. Damage to equipment caused by testing shall be repaired or replaced without additional cost to the Owner.

E. Exterior water piping shall be tested in strict compliance with local water company. The minimum hydrostatic test pressure is 1 1/2 times the water pressure serving the site.

F. No insulation, paint, backfill or other prohibitive covering shall be applied to piping prior to the above tests.

G. Provide all temporary equipment, materials, valves, gauges, etc., required for the preceding tests.

H. The expense of all tests shall be borne by the Contractor under this Division.

I. In addition to the testing specified above the Contractor shall perform the following HVAC systems tests and place the system(s) in operation to demonstrate that all features of the system(s) including instrumentation, controls, and equipment function as specified for final acceptance.

1. At such time as the Engineer determines that the new heating, ventilating, and cooling system is ready to be placed into service, the Contractor shall place the new equipment in operation and demonstrate that the safety devices are in proper working order to the satisfaction of the Engineer.

2. The Contractor shall then maintain operation and demonstrate each system's capability of producing at full load capacity. Within 24 hours after the systems have been satisfactorily tested, Owner operating personnel will relieve the Contractor of the operations and the Contractor shall continue his work on a joint occupation basis.

3. Depending on the status of the work, the Contractor may at his option conduct other required tests concurrent with, prior to, or following the system testing,

providing the Engineer is satisfied the installation is in conformance with the specifications. However, all features of the system(s) shall be tested individually for proper operation at partial and full load conditions and collectively where normal operations require the several components to operate concurrently to constitute an acceptable system.

4. Final acceptance of the entire installation will be based on an acceptable demonstration that all components, local and remote, respond to safety manual and Automatic System controls. During this test, the Contractor shall cause simulated perturbations for which the control system is designed to respond. All control, monitor and readout points in the system shall function properly before final acceptance is made.

1.26 CLEANING

A. Before the building is turned over to the Owner, all of the piping, ductwork and equipment must be carefully cleaned of debris and dust. All coils shall be cleaned and flushed out with new filters installed.

B. Utilities and Equipment: The Contractor shall provide all necessary temporary materials and equipment to clean the piping and equipment installed under this specification. No permanent equipment shall be used for storage, mixing, settling, compressing, pumping, etc., without the approval of the Architect. The Contractor shall supply a separate and independent source of clean, dry, oil-free air for the blowdown of systems requiring this method of cleaning.

C. Use of Chemicals: No chemicals, wetting or drying agents shall be used to clean systems or equipment where the materials of the system undergo any changes in their physical or structural characteristics. In case of any doubt as to the compatibility of any materials to the cleaning solution used, the Contractor shall obtain prior written approval for the use of the solution from the manufacturer of the equipment. Piping systems, equipment and sub-assemblies shall be cleaned after completion of welding, machining, threading, testing and any other operations capable of contaminating the system piping or equipment. After cleaning, the permanent strainers shall be removed, cleaned, and replaced. Temporary strainers shall be periodically removed, cleaned, and replaced during cleaning in lines ahead of equipment to protect against particles becoming lodged in the equipment.

D. After the Architect/Engineer has completed the examination, this Contractor shall remove all stickers, tags, etc., and shall thoroughly clean all equipment, fixtures, and materials installed under his section of the work.

E. Surplus material, rubbish and equipment resulting from the work shall be removed from the building and premises by the Contractor upon completion of the work in accordance with the General Conditions.

F. All equipment shall be thoroughly cleaned to "Factory New" condition prior to turning over to Owner. Touch up or completely re-paint equipment as required.

G. Keep all nameplates on equipment clean and exposed for easy reading.

1.27 PUNCH LISTS

A. The Contractor shall prepare and complete punch lists for all their scope of work and all associated Sub-Contractors.

B. The Engineer shall be notified one week in advance of above ceiling and below ceiling / final inspections.

C. Upon completion of all punch list items, the Contractor shall request that the Engineer develop a punch list. After all corrections have been made from the Engineer's punch list, the Contractor shall review and initial off on each item. This signed-off punch list shall

be submitted to the Engineer. The Engineer shall return to the site only once to review each punch list and all work prior to the ceilings being installed and at the final punch list review. The Contractor's representative may be requested at the inspections.

D. Upon inspection by the Engineer, if there are discrepancies found indicating the punch list is incomplete and additional visits will be required by the Engineer to review the incomplete work, the Engineer shall be reimbursed directly by the Contractor. This payment shall be made by check or money order to STW and due 10 days from date of each additional visit at a rate of $125.00 per hour plus travel expense for any extra trips required to complete either/any of the above ceiling, below ceiling or final punch lists. Sign-off on project completion will not be granted by the Engineer until all punch list items are deemed corrected at the Engineer's discretion and any additional monies due have been received by the STW.

1.28 WARRANTY AND SERVICE

A. All equipment and labor shall be warranted for a period of at least one (1) year from the date of acceptance, as evidenced by date of substantial completion for the entire project or for the last phase of the project, whichever occurs later, against defective materials, design, and workmanship. In addition to the equipment warranty, the Contractor shall provide all repair and adjustment service necessary for the proper operation of the entire system for a period of one (1) year after the date of acceptance, as evidenced by the date of substantial completion for the entire project or for the last phase of the project, whichever occurs later. Upon receipt of notice from the Owner's representative of failure of any part of the warranted system or equipment during the warranty period, the affected part shall be replaced promptly with a new part without cost to the Owner. Upon failure to take action within 24 hours after being notified, the work will be accomplished by the Engineer at the expense of the Contractor. See General Conditions and individual equipment specifications. Note that the warranty period of time specified in this section represents the minimum warranty period required for work performed under specification Division 21, 22 and 23. Where the General Conditions and/or individual equipment/system specifications require a warranty period of longer duration or earlier start date than specified in this paragraph, the longer duration/earlier start date shall supersede for those portions of work covered by that specification. In the event the Contractor is notified of warranty issues but does not correct or address the warranty issues prior to the end of the specified warranty period, the Contractor will not be relieved of the responsibility to correct the deficient items after the warranty end date has passed.

B. Make a minimum of two (2) service calls during guarantee period, free of charge, to check with Owner and to check and repair malfunctioning equipment which was installed. Service calls shall be in the middle and end of the guarantee period and as required to maintain the system's operation. Dates shall be listed in operating and maintenance manuals, along with Contractor's name and phone number.

C. The use of any permanent systems prior to substantial completion or the time identified by the GC/CM (whichever is more strict), does not alter or prematurely begin the warranty period.

D. The Contractor shall furnish three (3) copies of all Final Inspection Certificates obtained to the Engineer when work is complete. Final payment for work will be contingent upon compliance with this requirement.

1.29 AS-BUILT DRAWINGS, DESCRIPTIVE DATA AND O&M MANUALS

A. During construction, the Contractor shall retain a set of blue line drawings on the site for recording all changes. These drawings shall be available for inspection by the Engineer.

B. The Contractor shall deliver to the Engineer at the completion of the work, one (1) print of "As-Built" drawings, showing legibly and accurately, mechanical and piping systems with equipment locations shown as actually installed. Changes in original plans shall be

neatly shown in red pencil. Each print shall be signed by the sub-Contractor who has done the work.

C. Operating Instructions and Maintenance Manuals, Etc.

1. At completion of the contract, the Owner shall be provided with three (3) bound copies of operations and maintenance instructions, recommended list of spare parts required for a period of one (1) year and a list of any special tools required to maintain the equipment for the various items of the mechanical equipment. Where special tools are required, the Contractor shall furnish two (2) of each such tools to the Owner at no additional contract cost.

2. MANUAL SHALL INCLUDE ALL APPROVED SHOP DRAWINGS OF EQUIPMENT REQUIRING OPERATION AND MAINTENANCE INFORMATION.

3. MANUAL SHALL BE ORGANIZED WITH APPROVED SHOP DRAWING FOLLOWED BY ALL RELATED OPERATION AND MAINTENANCE MATERIAL.

4. EQUIPMENT SHALL BE IDENTIFIED IN ACCORDANCE WITH THE DRAWING NOMENCLATURE AND INCLUDE SUPPLIER OF SAID EQUIPMENT.

5. Instructions shall be included for routine checking of all items requiring continued maintenance.

6. Schematic drawings with actual pieces of mechanical equipment, etc., shall be included; where manufacturer's parts numbers only are applicable, they shall be included.

7. Detailed operating instructions for mechanical equipment shall be included, as well as general maintenance procedures to be followed on such equipment. Manufacturers maintenance and operation manuals will be required where such are normally available with the equipment, but as such information is often of a general nature and applicable to various models of equipment, such information shall be supplemented by specified typed directions for the particular piece of equipment applicable to this project.

1.30 DIGITAL DATA AND FILE TRANSMISSION

A. Sub-Contractors (SC) requiring digital files to prepare shop drawings and governmental agency submittals shall make their request through the Construction Manager (CM) or General Contractor (GC).

1. The CM/GC shall compile a list of requested drawings from the respective SC's and submit one comprehensive list to STW.

2. STW will provide the CM/GC with a digital file transmission release form. The CM/GC may sign and return or have the requesting SC's sign and return to STW through the CM/GC.

3. After receiving the signed release form, STW will provide one set of all requested digital files to the CM/GC to then distribute to the appropriate SC's.

4. STW will provide AutoCAD/dwg files.

a. Revit/BIM models will not be provided to Contractors. Projects completed using REVIT will be exported to AutoCAD prior to releasing.

B. The project architect is the owner/author of the floor plans and reflected ceiling plans.

1. The architect must approve the release of these plans before STW can release our respective drawings.

2. Requests for floor plans and/or reflected ceiling plans only shall be made directly to the architect.

END OF SECTION 23 01 00

SECTION 23 05 17 – SLEEVING, CUTTING, PATCHING AND REPAIRING FOR MECHANICAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes requirements for the Mechanical Contractor related to sleeving, cutting, patching, and repairing associated with mechanical work.

1.2 WORK INCLUDED

A. Sleeves

B. Sleeve Seals

C. Grout

D. Escutcheons

E. Lintels

1.3 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

PART 2 - PRODUCTS

2.1 SLEEVES

A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral water stop unless otherwise indicated.

B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.

C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.

D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness, round tube closed with longitudinal joint.

2.2 SLEEVE-SEAL SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Advance Products & Systems, Inc.

2. Metraflex Company (The).

3. Proco Products, Inc.

B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.

1. Sealing Elements: EPDM-rubber or NBR interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.

2. Pressure Plates: Carbon steel, Plastic, or Stainless steel.

3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, or Stainless steel of length required to secure pressure plates to sealing elements.

2.3 GROUT

A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

B. Characteristics: Non-shrink; recommended for interior and exterior applications.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.4 ESCUTCHEONS

A. Escutcheons shall be Beaton and Caldwell; Carpenter and Patterson; Fee and Mason or approved equivalent. Chromium-plated iron or chromium-plated brass, either one piece or split patterns, held in place by internal spring tension or set screw that completely covers opening.

2.5 LINTELS

A. New openings under 48" in width: Provide one 3 1/2" x 3 1/2" x 3 1/2" steel angle for each 4" of masonry width. Lintel shall have 8" bearing on either side.

B. New openings 48" to 96" in width: Provide one 3 1/2" x 6" x 3/8" steel angle for each 4" of masonry width. Lintel shall have 8" bearing on either side.

C. New openings over 96" in width: Consult the project structural engineer.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall be responsible for all openings, sleeves, trenches, etc., that he may require or create by demolition in floors, roofs, ceilings, walls, etc., and shall coordinate all such work with the General Contractor and all other trades. Coordinate with the General Contractor, any openings which he is to provide before submitting a bid proposal in order to avoid conflict and disagreement during construction. Improperly located openings shall be reworked at the expense of the Contractor.

B. The Contractor shall plan his work ahead and shall place sleeves, frames or forms through the walls, floors, and ceilings during the initial construction, where it is necessary for piping, ductwork, conduit, etc., to go throughout; however, when this is not done, the Contractor shall do all cutting and patching required for the installation of his work, or he shall pay other trades for doing this work when so directed by the Engineer. Any damage caused to the buildings by the workmen of the responsible Contractor must be corrected or rectified by him at his own expense.

C. The Contractor shall notify other trades in due time where he will require openings or chases in new concrete or masonry. He shall set all concrete inserts and sleeves for his work. Failing to do this, he shall cut openings for his work and patch same as required at his own expense.

D. The Contractor shall be responsible for properly shoring, bracing, supporting, etc., any existing and/or new construction to guard against cracking, settling, collapsing, displacing, or weakening while openings are being made. Any damage occurring to the existing and/or new structures, due to failure to exercise proper precautions or due to action of the elements shall be promptly and properly made good to the satisfaction of the Engineer.

E. All work improperly done or not done at all as required by the Mechanical Trades in this section, will be performed by the Contractor at the direction of the trade whose work is affected.

3.2 SLEEVES

A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.

1. Sleeves are not required for core-drilled holes.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.

1. Cut sleeves to length for mounting flush with both surfaces.

a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.

2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.

D. Install sleeves for pipes passing through interior partitions.

1. Cut sleeves to length for mounting flush with both surfaces.

2. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation.

3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint.

E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

F. Pipes Passing Through Waterproofing Membranes: Pipes passing through floor waterproofing membrane shall be installed through a 4-pound lead-flashing sleeve, or a 0.032-inch thick aluminum sleeve, each with an integral skirt or flange. Flashing sleeve shall be suitably formed, and the skirt of flange shall extend not less than 8 inches from the pipe and shall set over the floor membrane in a troweled coating of bituminous cement. The flashing sleeve shall extend up the pipe a minimum of 1 inch above the floor. The annular space between the flashing sleeve and the metal-jacket-covered insulation shall be sealed. At the Contractor's option, pipes passing through floor waterproofing membrane may be installed through a cast iron sleeve with caulking recess, anchor lugs, flashing clamp device, and a pressure ring with brass bolts. Waterproofing membrane shall be clamped into space and sealant shall be placed in the caulking recess.

G. Pipes Passing Through Roof: Pipes passing through the roof shall be installed where shown on the drawings. Any penetration in roof shall be approved by the Roofing Manufacturer.

H. Openings for ductwork, fixtures, equipment, etc. through floors, walls, ceiling, and roofs, shall be located and sized by the Contractor under this division who shall provide and set necessary lintels, sleeves, and sheet metal forms for all such openings.

I. Galvanized sheet metal collars shall be provided around all ducts, equipment, etc., exposed in finished areas. Where such openings and finished and the space around the penetration is small, the collar may be omitted with the approval of the Architect/Engineer.

3.3 SLEEVE-SEAL-SYSTEM INSTALLATION

A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.

B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.4 ESCUTCHEONS

A. Escutcheons shall be provided at all finished surfaces where exposed piping, bare or insulated, passes through floors, walls, or ceilings. Escutcheons shall be fastened securely to pipe sleeves or to extensions of sleeves without any part of sleeves being visible. Where sleeves project slightly from floors, special deep-type escutcheons shall be used.

3.5 CUTTING

A. All rectangular or special shaped openings in plaster, stucco, or similar materials, including gypsum board, shall be framed by means of plaster frames, casing beads, wood or metal angle members as required. The intent of this requirement is to provide smooth even termination of wall, floor, and ceiling finishes as well as to provide a fastening means for grilles, diffusers, lighting fixtures, etc.

B. All trades shall coordinate all openings in masonry walls with the General Contractor, and, unless otherwise indicated on the Architectural drawings, shall provide lintels for all openings required for the plumbing work (piping, wall boxes, etc.).

C. No cutting is to be done at points or in a manner that will weaken the structure and unnecessary cutting must be avoided. If in doubt, contact the engineer.

D. Pipe openings in slabs and walls shall be cut with core drill. Hammer devices will not be permitted. Edges of trenches and large openings shall be scribe cut with a masonry saw.

E. Openings in metal building walls shall be made in strict accord with building suppliers recommendations.

3.6 PATCHING AND REPAIRING

A. Patching and repairing made necessary by work performed under this division shall be included as part of the work and shall be done by skilled mechanics of the trade or trades for work cut or damaged, in strict accordance with the provisions herein before specified for work of like type to match adjacent surfaces and in a manner acceptable to the engineer.

B. Where portions of existing lawns, shrubs, paving, etc. are disturbed for installation or work of this Division, such items shall be repaired and/or replaced to the satisfaction of the engineer.

C. Where the installation or removal of piping, etc. requires or creates the penetration of fire or smoke rated walls, ceilings or floors, the space around such pipe, etc., shall be tightly filled with an approved non-combustible fire insulating material satisfactory to maintain the rating integrity of the wall, floor or ceilings affected.

D. Piping passing through floors, ceilings, and walls in finished areas, unless otherwise specified, shall be fitted with chrome plated brass escutcheons of sufficient outside diameter to amply cover the sleeved openings and an inside diameter to closely fit the pipe around which it is installed.

E. Where pipes pass through exterior walls, the wall openings shall be sealed air and watertight. This shall include sealing on both sides of the wall to ensure air and water

does not enter or exit the wall cavity. This is especially critical on exterior walls where the wall cavity may be vented to the exterior.

END OF SECTION 23 05 17

SECTION 23 05 29 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Pipe and Equipment Hangers, Supports, and Associated Anchors

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISION FOR MECHANICAL WORK

C. Section 230719 - HVAC PIPING INSULATION

D. Section 232113 - HYDRONIC PIPING AND VALVES

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product.

2. Show fabrication and installation details.

1.4 REFERENCES

A. ANSI/ASME B31.1 - Power Piping

1.5 SCOPE

A. This specification shall apply for the design and fabrication of all hangers, supports, anchors and guides. Where piping design is such that exceptions to this specification are necessary, the system shall be identified, and the exceptions approved by Engineer prior to installation.

1.6 STRUCTURE

A. This section is intended to cover the structural requirements of the piping and equipment. It is not intended to imply that the building structure will support the loads imposed. The contractor shall review the structural drawings for where loads can be applied, what load can be supported and what structural reinforcing is required. Specific questions can be directed to the structural engineer prior to bidding.

1.7 DESIGN

A. All supports and parts shall conform to the latest requirements of the ANSI Code for Pressure Piping B31.1.0, and MSS Standard Practice SP-58, SP-69 and SP-89 except as supplemented or modified by the requirements of this specification.

B. Designs generally accepted as exemplifying good engineering practice, using stock or production parts, shall be utilized wherever possible.

C. Accurate weight balance calculations shall be made to determine the required supporting force at each hanger location and the pipe weight load at each equipment connection.

D. Pipe hangers shall be capable of supporting the pipe in all conditions of operation. They shall allow free expansion and contraction of the piping, and prevent excessive stress resulting from transferred weight being induced into the pipe or connected equipment.

E. Where possible, steel structural attachments shall be beam clamps. Other attachments shall be as scheduled.

F. All rigid hangers shall provide a means of vertical adjustment after erection.

G. Hanger rods shall be subject to tensile loading only. At hanger locations where lateral or axial movement is anticipated, suitable support shall be provided to eliminate swing and allow for expansion.

H. Where horizontal piping movements are greater than ½ inch, or where the hanger load angularity from the vertical is greater than 4 degrees from the cold to hot position of the pipe, the hanger rod to structural attachment shall be by use of Anvil Fig. 47 and Fig. 299 or the hanger rod and structural attachments shall be offset in such manner that the rod is vertical in the hot position.

I. Contractor to fabricate and provide additional structural support as required to prevent sway where hanger rod lengths exceed 48” in length.

J. Hangers shall be designed so that they cannot become disengaged by movements of the supported pipe.

K. All piping and equipment shall be braced and secured to prevent sway and movement in all axes.

L. Hangers shall be spaced in accordance with ANSI B31.1.0

M. Where practical, riser piping shall be supported independently of the connected horizontal piping.

1. Pipe support attachments to the riser piping shall be riser clamp lugs. Welded attachments shall be of material comparable to that of the pipe and designed in accordance with ANSI B31.1 codes.

N. Supports, guides and anchors shall be so designed that excessive heat will not be transmitted to the building steel. The temperature of support parts shall be based on a temperature gradient of 100 degrees F per inch distance from the outside surface of the pipe.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Anvil, Elcen, Mason Industries, Advanced Thermal, Fee & Mason, Piping Specialties, MIRO Industries.

2.2 SHIELDS

A. Insulation-Insert Material for Cold Piping: ASTM C552, Type II cellular glass with 100-psi minimum compressive strength and vapor barrier.

B. Insulation-Insert Material for Hot Piping: Water-repellent-treated, ASTM C533, Type I calcium silicate with 100-psi minimum compressive strength.

C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

F. Shields for Copper Pipe shall utilize sheet lead.

2.3 INSERTS

A. Inserts: Malleable iron case or galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.4 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.

2. Galvanized Metallic Coatings: Pre-galvanized, hot dip galvanized, or electro-galvanized.

3. Nonmetallic Coatings: Plastic coated, or epoxy powder coated.

4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.

5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

B. Copper Pipe and Tube Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-plated steel, factory-fabricated components.

2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-plated steel.

2.5 TRAPEZE PIPE HANGERS

A. Description: MSS SP-58, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.6 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Description: Shop- or field-fabricated, pipe-support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.

2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.

3. Channels: Continuous slotted carbon-steel channel within turned lips.

4. Channel Width: Selected for applicable load criteria.

5. Channel Nuts: Formed or stamped nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.

6. Hanger Rods: Continuous-thread rod, nuts, and washer made of galvanized steel.

7. Metallic Coating: Pre-galvanized G90 (Z275).

2.7 BEAM CLAMPS

1. Beam clamps shall have malleable iron jaws, steel bolt or tie rod, nuts, and jamb nuts.

2. C-clamps will not be permitted unless retainer is provided.

2.8 PIPE STANDS

A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support above grade, floor, and roof (without roof penetration).

B. Compact Pipe Stand:

1. Description: Single base unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe.

2. Base: Single, vulcanized rubber, molded polypropylene, or polycarbonate.

3. Hardware: Galvanized steel or polycarbonate.

4. Accessories: Protection pads.

C. Low-Profile, Single Base, Single-Pipe Stand:

1. Description: Single base with vertical and horizontal members, and pipe support.

2. Base: Single, vulcanized rubber, molded polypropylene, or polycarbonate.

3. Members: Two, galvanized-steel, continuous-thread 1/2-inch rods.

4. Horizontal Member: Adjustable horizontal, galvanized-steel pipe support channels.

5. Pipe Supports: Roller.

6. Hardware: Galvanized steel.

7. Accessories: Protection pads.

8. Height: 12 inches above grade, floor, or roof.

D. High-Profile, Single Base, Single-Pipe Stand:

1. Description: Single base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.

2. Base: Single vulcanized rubber or molded polypropylene.

3. Vertical Members: Two, galvanized-steel, continuous-thread 1/2-inch rods.

4. Horizontal Member: One, adjustable height, galvanized-steel pipe support slotted channel or plate.

5. Pipe Supports: Roller.

6. Hardware: Galvanized.

7. Height: 36 inches above grade, floor, or roof.

E. High-Profile, Multiple-Pipe Stand:

1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.

2. Bases: Two or more; vulcanized rubber.

3. Vertical Members: Two or more, galvanized-steel channels.

4. Horizontal Members: One or more, adjustable height, galvanized-steel pipe support.

5. Pipe Supports: Roller.

6. Hardware: Galvanized steel.

F. Curb-Mounted-Type Pipe Stands: Shop- or field-fabricated pipe supports made from structural-steel shapes, continuous-thread rods, and rollers, for mounting on permanent stationary roof curb.

2.9 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.10 OUTDOOR EQUIPMENT STANDS

A. Description: Individual foot supports with elevated adjustable channel cross bars and clamps/fasteners/bolts for ground or roof supported outdoor equipment components,

without roof membrane penetration, in a prefabricated system that can be modularly assembled on site.

B. Foot Material: Rubber or polypropylene.

C. Rails Material: Hot dip galvanized carbon steel.

D. Wind/Sliding Load Resistance: Up to 100 mph minimum.

2.11 FINISH

A. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.1 INSERTS

A. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

B. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.

3.2 PIPE HANGERS AND SUPPORTS

A. Comply with MSS SP-58 for pipe-hanger selections and applications.

B. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

C. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

D. Use carbon-steel pipe hangers and supports and metal framing systems and attachments for general service applications.

E. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.

F. Use thermal-hanger shield inserts for insulated piping and tubing.

G. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.

H. Place a hanger within 12 inches of each horizontal elbow.

I. Provide hangers with 1-1/2-inch minimum vertical adjustment.

J. Provide additional structural support where required to prevent pipe movement and sway.

K. Support riser piping independently of connected horizontal piping.

L. Support piping as follows:

Nominal Pipe Size	Single Rod Diameter	Thickness of Insulation Shield	Maximum Spacing Ferrous Piping	Copper Tubing	HDPE, PVC, Plastic Piping
3/4" & Under	3/8"	16 gauge	6'	5'	2.5'
1"	3/8"	16 gauge	7'	6'	3'
1 1/4	3/8"	16 gauge	8'	8'	4'
1 ½"&2"	3/8"	16 gauge	9'	8'	4'

2 ½"&3"	½"	12 gauge	12'	8'	4'
4" & 5"	5/8"	12 gauge	14'	8'	4'
6"	3/4"	10 gauge	14'	8'	4'
8"	7/8"	8 gauge	14'	10'	5'

END OF SECTION 23 05 29

SECTION 23 05 53 – IDENTIFICATION OF HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

A. Identification of products installed under Division 23 including:

1. Plastic Nameplates
2. Plastic Tags
3. Metal Tags
4. Stencils and Paint
5. Plastic Pipe Markers
6. Plastic Tape Pipe Markers
7. Underground Plastic Tape Pipe Markers

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product indicated.
2. Piping and Equipment Label Schedule: Include a listing of all piping and equipment to be labeled with the proposed content for each label.
3. Submit list of wording, symbols, letter size, and color coding for mechanical identification.
4. Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Valve Schedules for each piping system to include in operation and maintenance manuals.

1.5 REFERENCES

A. ANSI/ASME A13.1 - Scheme for the Identification of Piping Systems.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Brady Corp., Craftmark Pipe Markers, Seton Identification Products.

2.2 Color: Unless specified otherwise, conform with ANSI/ASME A13.1.

2.3 Plastic Nameplates: Laminated three-layer plastic with engraved black letters on light contrasting background color.

2.4 Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2-inch square.

2.5 Metal Tags: Brass or aluminum with stamped letters; tag size minimum 1-1/2-inch diameter with smooth edges.

2.6 Stencils: With clean cut symbols and letters of following size:

Outside Diameter of Insulation or Pipe	Length of Color Field	Size of Letters
3/4" - 1-1/4”	8"	1/2"
1-1/2" - 2"	8"	3/4"
2-1/2" - 6"	12"	1-1/4"
8" - 10"	24"	2-1/2"
Over 10"	32"	3-1/2"

A. Stencil Paint: Semi-gloss enamel black unless otherwise indicated.

2.7 Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and fluid being conveyed.

2.8 Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

2.9 Underground Plastic Pipe Markers: Bright colored continuously printed plastic ribbon tape of not less than 6-inch-wide by 4 mil thick, manufactured for direct burial service.

A. Underground plastic piping to be installed with a tracer wire.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials and to accept stencil painting.

3.2 INSTALLATION

A. Plastic Nameplates: Install with corrosive-resistant mechanical fasteners, or adhesive.

B. Plastic or Metal Tags: Install with corrosive-resistant chain.

C. Stencil Painting: Apply in accordance with manufacturer's instructions.

D. Plastic Pipe Markers: Install in accordance with manufacturer's instructions.

E. Plastic Tape Pipe Markers: Install complete around pipe in accordance with manufacturer's instructions.

F. Underground Plastic Pipe Markers: Install 6 to 8 inches below finished grade, directly above buried pipe.

G. Equipment: Identify HVAC equipment such as but not limited to air handing equipment, condensing units, chillers, pumps, storage tanks, expansion tanks, water treatment devices etc. with plastic nameplates. Small devices, such as in-line pumps, may be identified with plastic or metal tags.

H. Controls: Identify control panels and major control components outside panels with plastic nameplates.

I. Valves: Identify valves in main and branch piping with tags.

J. Piping: Identify piping, concealed, or exposed, with plastic pipe markers or plastic tape pipe markers. Stenciled painting may be used on insulation. Tags may be used on small diameter piping. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and "T", at each side of penetration of structure or enclosure, and at each obstruction.

3.3 VALVES AND CHARTS

A. The Contractor under this Division shall attach a numbered brass tag to each valve installed under this Contract. Each number shall be prefixed with the “H" for hydronic valves. Tags shall be attached to the valves by means of brass "S" hooks. Tags shall be Seton Name Plate Co., C.H. Hanson Co. or Identifications.

B. A chart headed "HYDRONIC VALVE CHART" shall be prepared. Three original charts shall be prepared and approved by the engineer. One of each approved type chart shall be framed under glass and mounted on the wall in the main mechanical room where directed. Three photocopies of each chart shall be made and shall be submitted through normal shop drawing channels for approval and subsequent owner's files. Each chart shall be formatted as shown below: (All normally closed valves shall have a brass tag marked Normally Closed.)

HYDRONIC VALVE CHART
PROJECT NAME
DATE

TAG NO.	VALVE LOCATION	VALVE TYPE/SIZE	VALVE FUNCTION

END OF SECTION 23 05 53

SECTION 23 07 19 – HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Piping Insulation

B. Jackets and Accessories

1.2 RELATED WORK

A. The General and Special Conditions and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

C. Section 230553 - IDENTIFICATION OF HVAC PIPING AND EQUIPMENT

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

1.4 QUALITY ASSURANCE

A. Materials: Flame spread smoke developed rating of 25/50 in accordance with ASTM E84.

B. All pipe insulation shall be installed by mechanics specializing in this type of work. The finished product shall present a neat and workmanlike appearance. Insulation shall not be applied until all tests except operating tests have been completed, all foreign material, such as rust, scale, or dirt, has been removed and the surfaces are clean and dry. Insulation shall be clean and dry when installed and during the application of any finish.

C. The insulation, insulating materials and related items shall be delivered to the jobsite in the manufacturer's unopened containers. The containers shall have labels stating the manufacturer's name, contents, quantity and other pertinent data.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Insulations having the thermal and physical properties of the specific materials specified hereinafter, of any of the following manufacturers, or approved equal, are acceptable.

Armstrong	Knauf
Johns Mansville	Certain Teed/Saint Gobain
Owens-Corning	Pittsburgh Corning
Rubatex	

B. The Engineer reserves the right to determine if the proposed insulating materials of any one manufacturer are acceptable in lieu of the specific insulation selected for the following applications.

2.2 INSULATION

A. Type A glass fiber insulation; ANSI/ASTM C547; 'k' value of 0.23 minimum at 75 degrees F; noncombustible.

B. Type B cellular foam; flexible, plastic; 'k' value of 0.25 minimum at 75 degrees F; ASTM C534. APArmaflex W (white) or APArmaflex SS (black) or equal.

C. Type C calcium silicate.

1. Preformed Pipe Sections: Flat-, curved-, and grooved-block sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C 533, Type I.

2. Flat-, curved-, and grooved-block sections of noncombustible, inorganic, hydrous calcium silicate with a non-asbestos fibrous reinforcement. Comply with ASTM C 533, Type I.

3. Prefabricated Fitting Covers: Comply with ASTM C 450 and ASTM C 585 for dimensions used in preforming insulation to cover valves, elbows, tees, and flanges.

4. Calcium Silicate insulation is preferred over fiberglass in mechanical and heating plant applications, where piping is more subject to abuse.

2.3 JACKETS

A. Vapor Barrier Jackets: Kraft reinforced foil vapor barrier with self-sealing adhesive joints.

B. PVC Jackets: One piece, premolded type.

C. Canvas Jackets: UL listed treated cotton fabric, 6 oz/sq yd.

2.4 ACCESSORIES

A. Insulation Bands: 3/4 inch wide; 0.015 inch thick galvanized steel, stainless steel. 0.007 inch 0.18 thick aluminum.

B. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum. 0.010 inch thick stainless steel.

C. Insulating Cement: ANSI/ASTM C195; hydraulic setting mineral wool.

D. Finishing Cement: ASTM C449.

E. Fibrous Glass Cloth: Untreaded; 9 oz/sq yd weight.

F. Adhesives: Compatible with insulation.

G. Treated wooden blocks.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install materials after piping has been tested and approved.

3.2 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Continue insulation with vapor barrier through penetrations, except on fire rated walls.

C. In exposed piping, locate insulation and cover seams in least visible locations.

D. On insulated piping with vapor barrier, insulate fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.

E. Provide an insert, not less than 6 inches long, of same thickness and contour as adjoining insulation, between support shield and piping, but under the finish jacket, on piping 2 inches diameter or larger, to prevent insulation from sagging at support points. Inserts shall be cork or other heavy density insulating material suitable for the planned temperature range. Factory fabricated inserts may be used. Insert shall extend around bottom 120 degrees of pipe barrel and shall be included inside vapor barrier jacket where applied. See Section 230529 for shields and hangers.

F. Neatly finish insulation at supports, protrusions, and interruptions.

G. Jackets

1. Indoor, Concealed Applications: Insulated pipes shall have standard jackets, with vapor barrier, factory-applied or field-applied. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass cloth and adhesive. PVC jackets may be used.

2. Indoor, Exposed Applications: For pipe exposed in mechanical equipment rooms or in finished spaces, insulate as for concealed applications. Finish with canvas jacket; size for finish painting. This jacketing must be properly applied with lagging adhesive, such that the outer surface is smooth and free of wrinkles. Do not use PVC jackets. All chilled water piping insulation shall be completely sealed so that a perfect vapor barrier is achieved.

3. Indoor, Field-Applied Jacket Schedule: Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket. Piping jacket shall be Stainless Steel, Type 304 or Type 316, Smooth 2B Finish: 0.020 inch thick.

4. Outdoor, Field-Applied Jacket Schedule: Install jacketing on all piping to be installed outside the building per the following: foil faced, UV-resistant vapor barrier and weather barrier membrane, self-stick, self-healing, with a zero perm rating; for use on exterior duct, piping, and vessels. Jacketing shall be a high strength foil/polymer laminate coated with self-healing, self-adhering rubberized asphalt. Jacketing shall not require ‘slip joints’ and shall expand and contract with the system without rupture or leakage. Jacketing shall be for use as UV protection, weather protection, vapor barrier, and mechanical protection; and simple ‘peel and stick’ installation.

5. Flanges, Valves, Anchors and Fittings: Unless otherwise specified, all flanges, valves, anchors and fittings shall be insulated with factory premolded or field fabricated segments of insulation of the same materials and thickness as the adjoining pipe insulation. When segments of insulation are used, elbows shall be provided with not less than three segments. For other fittings and valves, segments shall be cut to required curvatures, or nesting size sectional insulation shall be used. The segments of the insulation shall be properly placed and jointed with fire-resistant adhesive. After the insulation segments are firmly in place, fire-resistant vapor barrier coating shall be applied over the insulation in two coats with glass tape embedded between coats. The coating shall be applied to a total dry film thickness of 1/16 inch minimum. All glass tape seams shall be terminated neatly at the ends of the unions with insulating cement troweled on the bevel. For piping operating below ambient temperature, the beveled ends shall receive a coat of vapor barrier coating. Where anchors are used and secured directly to low temperature piping, they shall be insulated for a distance to prevent condensation, but not less than 6 inches from the surface of the pipe insulation. For jacket facing to receive finish painting, the factory applied jacket shall be as specified herein, except that the kraft paper shall be light

colored with the kraft paper exposed. Field applied vapor barrier jacket shall conform to the above conditions where finish painting is required.

INSULATION APPLICATION AND THICKNESS (inches)

PIPE SYSTEM	TYPE	TEMP RANGE DEG F	Pipe Diameter Range (Inches) <1	1-1.5	1.5-4	4-<8	>8
			Insulation Thickness (inches)				
CONDENSATE DRAIN	B		0.5	0.5	0.5	0.5	0.5
REFRIGERANT	B		0.5	1.0	1.0	1.0	1.0
HEATING HOT WATER	A/B	120-200	1.5	1.5	2.0	2.0	2.0
CHILLED WATER	A/B	40-55	1.0	1.5	1.5	2.0	2.0
DOMESTIC WATER	A/B	55-70	1.5	1.5	1.5	1.5	1.5

END OF SECTION 23 07 19

SECTION 23 23 00 – REFRIGERANT PIPING & VALVES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Pipe and pipe fittings

B. Valves

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

C. Section 230719 - HVAC PIPING INSULATION

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of valve, refrigerant piping, and piping specialty.

2. Welder certificates.

1.4 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to ASME Boiler and Pressure Vessel Code: Section IX, “Welding and Brazing Qualification.”

B. Comply with ASHRAE 15, “Safety Code for Refrigerant Systems.”

C. Comply with ASME B31.5, “Refrigerant Piping and Heat Transfer Components.”

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Copper Tube: ASTM B 88, Type K or L or ASTM B 280, Type ACR.

B. Wrought-Copper Fittings: ASME B16.22.

C. Wrought-Copper Unions: ASME B16.22. Solder Filler Metals: ASTM B 32. Use 95-5 tin antimony or alloy HB solder to join copper socket fittings on copper pipe.

D. Brazing Filler Metals: AWS A5.8.

2.2 PIPING APPLICATIONS FOR REFRIGERANT R-410A

A. Suction, Hot-Gas and Liquid Lines: Copper, Type ACR or L or K, annealed- or drawn-temper tubing and wrought-copper fittings with brazed or soldered joints.

2.3 VALVES AND SPECIALTIES

A. All valves and specialties to be rated for a working pressure of 500 psig and a maximum operating temperature of 240 deg F.

B. Diaphragm Packless Valves:

1. Body and Bonnet: Forged brass or cast bronze; globe design with straight-through or angle pattern.

2. Diaphragm: Phosphor bronze and stainless steel with stainless-steel spring.

3. Operator: Rising stem and hand wheel.

4. Seat: Nylon.

C. Packed-Angle Valves:

1. Body and Bonnet: Forged brass or cast bronze.
2. Packing: Molded stem, back seating, and replaceable under pressure.
3. Operator: Rising stem.
4. Seat: Nonrotating, self-aligning polytetrafluoroethylene.
5. Seal Cap: Forged-brass or valox hex cap.

D. Check Valves:

1. Body: Ductile iron, forged brass, or cast bronze; globe pattern.
2. Bonnet: Bolted ductile iron, forged brass, or cast bronze; or brass hex plug.
3. Piston: Removable polytetrafluoroethylene seat.
4. Closing Spring: Stainless steel.
5. Manual Opening Stem: Seal cap, plated-steel stem, and graphite seal.
6. Maximum Opening Pressure: 0.50 psig.

E. Service Valves:

1. Body: Forged brass with brass cap including key end to remove core.
2. Core: Removable ball-type check valve with stainless-steel spring.
3. Seat: Polytetrafluoroethylene.

F. Solenoid Valves: Comply with ARI 760 and UL 429; listed and labeled by an NRTL.

G. Safety Relief Valves: Comply with ASME Boiler and Pressure Vessel Code; listed and labeled by an NRTL.

H. Thermostatic Expansion Valves: Comply with ARI 750.

I. Hot-Gas Bypass Valves: Comply with UL 429; listed and labeled by an NRTL.

J. Straight-Type Strainers:

1. Body: Welded steel with corrosion-resistant coating.
2. Screen: 100-mesh stainless steel.

K. Angle-Type Strainers:

1. Body: Forged brass or cast bronze.
2. Drain Plug: Brass hex plug.
3. Screen: 100-mesh monel.

L. Moisture/Liquid Indicators:

1. Body: Forged brass.
2. Window: Replaceable, clear, fused glass window with indicating element protected by filter screen.
3. Indicator: Color coded to show moisture content in ppm.
4. Minimum Moisture Indicator Sensitivity: Indicate moisture above 60 ppm.

M. Replaceable-Core Filter Dryers: Comply with ARI 730.

N. Permanent Filter Dryers: Comply with ARI 730.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems; indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Shop Drawings.

B. Install refrigerant piping according to ASHRAE 15.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping adjacent to machines to allow service and maintenance.

G. Install piping free of sags and bends.

H. Install fittings for changes in direction and branch connections.

I. Select system components with pressure rating equal to or greater than system operating pressure.

J. Install piping as short and direct as possible, with a minimum number of joints, elbows, and fittings.

K. Arrange piping to allow inspection and service of refrigeration equipment. Install valves and specialties in accessible locations to allow for service and inspection. Install access doors or panels as required if valves or equipment requiring maintenance is concealed behind finished surfaces.

L. Install refrigerant piping in protective conduit where installed belowground.

M. Install refrigerant piping in rigid or flexible conduit in locations where exposed to mechanical injury.

N. Slope refrigerant piping as follows:

1. Install horizontal hot-gas discharge piping with a uniform slope downward away from compressor.

2. Install horizontal suction lines with a uniform slope downward to compressor.

3. Install traps and double risers to entrain oil in vertical runs where required.

4. Liquid lines may be installed level.

O. When brazing or soldering, remove solenoid-valve coils and sight glasses; also remove valve stems, seats, and packing, and accessible internal parts of refrigerant specialties. Do not apply heat near expansion-valve bulb.

P. Install pipe sleeves at penetrations in exterior walls and floor assemblies.

Q. Seal penetrations through fire and smoke barriers.

R. Install piping with adequate clearance between pipe and adjacent walls and hangers or between pipes for insulation installation.

S. Install sleeves through floors, walls, or ceilings, sized to permit installation of full-thickness insulation.

T. Seal pipe penetrations through exterior walls.

3.2 PIPE JOINT CONSTRUCTION (per manufacturer)

A. Ream ends of pipes and tubes and remove burrs.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Fill pipe and fittings with an inert gas (nitrogen or carbon dioxide), during brazing or welding, to prevent scale formation.

D. Soldered Joints: Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook."

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," Chapter "Pipe and Tube."

1. Use Type BcuP, copper-phosphorus alloy for joining copper socket fittings with copper pipe.

2. Use Type BAg, cadmium-free silver alloy for joining copper with bronze or steel.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. Comply with ASME B31.5, Chapter VI.

END OF SECTION 23 23 00

SECTION 23 31 13 – DUCTWORK AND DUCTWORK INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Low Pressure Ducts

B. Insulation

C. Duct Cleaning

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

C. Section 233300 – DUCTWORK ACCESSORIES

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product data: For each type of the following:

a. Ductwork.

b. Ductwork insulations.

c. Ductwork Hangers.

1.4 REFERENCES

A. ASHRAE - Handbook 2013 Fundamentals; Chapter 21- Duct Design.

B. ASHRAE - Handbook 1989 HVAC Systems and Equipment; Chapter 19 - Duct Construction.

C. ASHRAE - Surface Burning Characteristics of Building Materials.

D. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

E. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems.

F. NFPA 96 - Installation of Equipment for the removal of Smoke and Grease- Laden Vapors from Commercial Cooling Equipment.

G. IMC - International Mechanical Code - Latest Issue

H. SMACNA - HVAC Duct Construction Standards, Metal and Flexible.

I. UL 181 - Factory-made Air Ducts and Connections.

1.5 DEFINITIONS

A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain sizes inside lining.

B. Low Pressure: Up to 2” WG positive or negative and/or velocities less than 2,000 fpm.

C. Medium Pressure: Up to 3” WG positive or negative and/or velocities less than 2,500 fpm.

PART 2- PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. C&R Sheet Metal, Ductmate, DuctSox Corporation, Eastern Sheet Metal, Euro-Aire, Fabricair, FlexmasterUSA, KE Fibertec, Lindab, Nordfab, Prihoda, Turnkey or Hamlin.

2.2 MATERIALS

A. General: Non-combustible or conforming to requirements for Class 1 air duct materials, or UL 181.

B. All duct material and covering shall have a flame spread rating of 24 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E84.

C. Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock forming quality, having zinc coating of 1.25 oz. Per sq. ft. for each side in conformance with ASTM G90.

D. Duct Schedule:

1. Supply, Return, Exhaust and Outside Air Ducts connected to Fan Coil Units, Furnaces, Heat Pumps, Variable Air Volume Box (VAV box outlet to grille, register, diffuser) and Terminal Units:

a. Pressure Class (Low Pressure): Positive 2-inch wg.

b. Minimum SMACNA Seal Class: C.

c. SMACNA Leakage Class for Rectangular: 16.

d. SMACNA Leakage Class for Round and Flat Oval: 8.

2. Supply Ducts Connected to Constant-Volume and Variable-Volume Air-Handling Units (air handling unit to VAV Box inlet):

a. Pressure Class (Medium Pressure): Positive 3-inch wg.

b. Minimum SMACNA Seal Class: B.

c. SMACNA Leakage Class for Rectangular: 8.

d. SMACNA Leakage Class for Round and Flat Oval: 4.

3. All other ducts not listed above:

a. Pressure Class (Low Pressure): Positive 2-inch wg.

b. Minimum SMACNA Seal Class: C.

c. SMACNA Leakage Class for Rectangular: 16.

d. SMACNA Leakage Class for Round and Flat Oval: 8.

E. Flexible Ducts: Interlocking spiral of galvanized steel, or fabric supported on helically wound spring steel wire rated to

1. Standard: Product is to be UL 181 listed and bearing the UL label.

2. Flexible Ducts – Class 1, interlocking spiral of galvanized steel or fabric, supported on helically-wound spring steel wire.

3. Pressure Rating: 2 inches WG positive and 1.5 inches WG negative for low pressure ducts and 15 inches positive or negative for medium high-pressure ducts.

4. Maximum length per run shall be 48".

F. Insulated Flexible Duct:

1. Standard: Product is to be UL 181 listed and bearing the UL label.

2. Flexible Ducts, Insulated - Class 1, Two-Ply Vinyl Film Supported by Helically Wound, Spring-Steel Wire; Fibrous-Glass Insulation.

3. Pressure Rating: 10 inch WG positive and 1.0 inch WG negative

4. Maximum Air Velocity: 4000 fpm.

5. Temperature Range: -10 deg F to +160 deg F.

6. Insulation R-Value: R-6.

7. Vapor-Barrier Film: Metalized Polyester.

8. Maximum length per run shall be 48”.

G. Stainless Steel Ducts: ASTM A480/A480M, Type 304.

H. Double-Wall Duct and Fittings

1. Outer Duct to conform with SMACNA Duct Construction Standards.

2. Inner Duct: Minimum 0.028-inch perforated galvanized sheet steel having 3/32-inch diameter perforations, with overall open area of 23%.

3. Interstitial Insulation: Fibrous-glass liner complying with ASTM C1071, NFPA 90A or NFPA 90B; and NAIMA AH124, “Fibrous Glass Duct Liner Standard”.

a. Maximum Thermal Conductivity: 0.27 Btu x in./hr. x sq. ft. x deg F at 75 deg F mean temperature.

b. Install spacers that position the duct liner at uniform distance from the outer duct without compressing insulation.

c. Coat insulation with antimicrobial coating.

d. Cover insulation with polyester film complying with UL 181, Class 1.

I. Fasteners: Rivets, bolts, or sheet metal screws.

J. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used with tape, or heavy mastic.

K. Hanger Rod: Steel, galvanized; threaded both ends, threaded one end, or continuously threaded. Stainless steel for stainless steel duct.

2.3 INSULATION

A. Internal: Glass fiber; ASTM C1071, G21 and G22 with an NRC not less than .65, 1.5 lb./.cu. ft. minimum density; smooth black matted air side surface for maximum 5000 FPM air velocity.

B. External (choose one of the following):

1. Flexible or rigid glass fiber; ASTM C1290 and C1136 all-service duct wrap; K value of .27 at 75 degrees F and a minimum installed R-value of R-6. Provide with foil scrim facing.

2. Reflectix (or equal) R-6.0 insulation having two layers of aluminum foil with polyethylene bonded for strength, and two inner layers of insulated bubbles; 5/16” thick; 1.25 oz./sq. ft. Flame and smoke 25/50.

C. Insulation material and jackets shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E84.

D. Adhesives: Waterproof fire-retardant tape.

E. Lagging Adhesives: Fire resistive to ASTM E84, NFPA 255, UL723.

F. Impale Anchors: Galvanized steel, 12- gage, spot welded or self-adhesive pad. No anchors shall penetrate duct walls.

G. Joint Tape: Glass fiber cloth, open mesh.

H. Tie Wire: Annealed steel, 16-gage.

2.4 DUCT HANGERS

A. All duct hangers in direct contact with galvanized duct shall be galvanized steel.

B. All duct hangers in direct contact with stainless steel ducts shall be stainless steel.

PART 3 - EXECUTION

3.1 LOW PRESSURE DUCTWORK

A. Fabricate and support in complete accordance with SMACNA HVAC Duct Construction Standards, Metal and Flexible and ASHRAE handbooks latest editions, except as indicated. Provide duct material, gages, reinforcing, and sealing for operation pressures indicated.

B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by written permission.

C. Construct T's, bends, and elbows with a radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation fill.

D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 30 degrees.

E. Provide easements where low pressure ductwork conflicts with piping and structure. Where easements exceed 10 percent duct area, split into two ducts maintaining original duct area.

F. Connect flexible ducts to metal ducts with draw bands or adhesive plus sheet metal screws.

G. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.

3.2 DUCTWORK INSTALLATION

A. Provide engineered openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring and maintain vapor barrier where applicable.

B. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

C. Provide residue traps in kitchen hood exhaust ducts at base of vertical risers with provisions for cleanout. Use stainless steel for ductwork exposed to view and stainless steel or galvanized steel for ducts where concealed.

D. During construction, provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

E. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment which may be harmed by excessive dirt with temporary filters, or bypass during cleaning.

F. Space between duct and floor or masonry wall openings shall be sealed with fire rated caulk.

G. Verify all field conditions before fabrication of ductwork to avoid installation conflicts. Notify Engineer of any conflict areas.

H. Do not change the designed path of ductwork, add excessive turns or offsets, or change duct sizes without first consulting the Engineer.

3.3 INSULATION INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Exterior Insulation Application

1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.

2. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.

3. Continue insulation with vapor barrier though penetrations.

C. Internal Application

1. Adhere insulation with adhesive for 100 percent coverage. Secure insulation with mechanical fasteners on 15-inch centers maximum on top and side of ductwork with dimension exceeding 20 inches. Seal and smooth joints. DO not use nail-type fasteners. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.

2. Ductwork dimensions indicated are net inside dimensions required for air flow. Increase ductwork to allow for insulation thickness.

D. Insulation Schedule

1. Supply, return, and outside air ductwork shall be insulated with external insulation as noted below.

2. Ductwork listed below that is to be externally insulated:

a. All supply, return and outside air ductwork shall be externally insulated unless otherwise noted.

3. Externally insulated ductwork shall be insulated using one of the following methods:

a. Ductwork shall be externally insulated with Reflectix (or equal) R-6.0 insulation having two layers of aluminum foil with polyethylene bonded for strength, and two inner layers of insulated bubbles; 5/16" thick; 1.25 oz./sq. ft. Flame and smoke 25/50.

i) Ductwork may also be insulated with fiberglass insulation, maintaining the insulation value of R-6.0, in lieu of Reflectix insulation.

4. Insulation must be installed in strict accordance with insulation manufacturer's requirements. Provide spacers, pins, bands and adhesive as required. Special care must be taken on large ductwork to prevent sagging of insulation away from ductwork.

5. Interior exhaust duct shall not require insulation

6. Combustion air duct shall have 1½ inch external insulation.

7. Where duct is scheduled to be insulated (either externally or internally) herein and shown to be routed in an area that will be exposed based on Architectural drawings, the Contractor shall provide double-wall duct conforming with the specifications provided herein.

8. All ductwork insulation must conform to the minimum requirements of ASHRAE 90.1 (current edition) and International Energy Conservation Code (current edition) unless otherwise specified in this section.

3.4 HANGERS

A. Duct hangers may be directly attached to ducts. Ducts shall be hung by angles or straps as listed in the following schedule. Rods, straps or angles may be used in trapeze hangers. Hangers shall be in accordance with the following schedule, except that there shall be no less than one set of hangers for each section of ductwork. Where elbows or tees are installed for changes in direction, hangers shall be provided. No ductwork shall rest on the building structural system. No ductwork shall be supported by suspended ceiling systems. All ductwork must be independently supported from building structural system.

B. Where trapeze hangers are used, the bottom of the duct shall be supported to angle sized as follows (for round ducts, the angle shall conform to the bottom 120 degrees of the duct):

Diameter of Duct	Width of Duct	Bottom Angle Sizes
0”-32”	0”-30”	1” x 1” x 1/8”
35” and Larger	31” - 48”	1-1/2” x 1-1/2” x 1/8”

C. All hangers shall be sufficiently across-braced to eliminate, in the opinion of the Architect, excessive sway. Wherever ductwork contains filter sections, coils, fans or other heavy equipment (excluding registers, grilles, diffusers, splitter dampers, etc.) such equipment shall be hung independently of the ductwork, with rods or angles of sizes adequate to support the load.

D. Special Duct Hanging Conditions

1. In the event ductwork interferes with suspended ceiling support hangers, provide cross members from hangers affected. These cross members shall be of reinforcing steel or furring channels and shall run under ductwork in question from which additional ceiling hangers shall be supported.

END OF SECTION 23 31 13

SECTION 23 33 00 – DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Volume Control Dampers

B. Fire Dampers

C. Backdraft Dampers

D. Air Turning Devices

E. Flexible Duct Connectors

F. Duct Access Doors

G. Duct Test Holes

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - General Provisions for Mechanical Work

C. Section 233113 - Ductwork and Ductwork Insulation

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product specified.

PART 2 - PRODUCTS

2.1 VOLUME CONTROL DAMPERS

A. Acceptable Manufacturers

1. United Enertech, Air Balance, American Warming, Arrow, Cesco, Creative Metals, Nailor, Pottorff, Ruskin, Vent Products, and Whiz Air.

B. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.

C. Fabricate splitter dampers of material same gage as duct to 24 inches size in either direction and two gages heaver for sizes over 24 inches.

D. Fabricate splitter dampers to streamline shape. Secure blade with continuous hinge or rod. Operate with minimum 1/4-inch diameter rod in self-aligning, universal joint action flanged bushing with set screw.

E. Fabricate single blade dampers for duct sizes to 12 inch.

F. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12 x 72 inches. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.

G. Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.

H. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where rod lengths exceed 30 inches provide regulator at both ends.

I. Where ductwork is required to have external insulation wrap applied, dampers shall be provided with 2” stand-off (minimum) to allow full range of motion of damper handle without damage to surrounding insulation.

2.2 FIRE DAMPERS

A. Acceptable Manufacturers

1. United Enertech, Air Balance, Arrow, Cesco, Greenheck, Metalaire, Pottorff, Prefco, Ruskin, and Vent Products.

B. Fabricate in accordance with NFPA 90A and UL 555, and as indicated. Provide dynamic type damper unless otherwise specified as static.

C. Fabricate ceiling firestop flaps of galvanized steel, 22 gage frame and 16 gage flap, two layers 0.125-inch ceramic fiber on top side, and one layer on bottom side for round flaps, with locking clip.

D. Fabricate ceiling dampers of galvanized steel, 22 gage frame, stainless steel closure spring, and light weight, heat retardant non-asbestos fabric blanket closure.

E. Fabricate curtain type dampers of galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations. Configure with blades out of air stream.

F. Fabricate multiple blade fire dampers with 16 gage galvanized steel frame and blades, oil-impregnated bronze or stainless-steel sleeve bearings and plated steel axles, 1/8 x ½ inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock. Fire dampers shall have UL rating.

G. Fusible links, UL 33, shall separate at 160 degrees F. Provide adjustable link straps for combination fire/balancing dampers.

2.3 BACKDRAFT DAMPERS

A. Acceptable Manufacturers

1. United Enertech, Air Balance, Arrow, Cesco, Nailor, Pottorff, Ruskin, and Vent Products.

B. Gravity backdraft dampers, size 18 x 18 inches or smaller, furnished with air moving equipment, may be air moving equipment manufacturers standard construction.

C. Fabricate multi-blade, parallel action gravity balanced backdraft dampers of 16 gage galvanized steel, with center pivoted blades of maximum 6-inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

2.4 AIR TURNING DEVICES

A. Acceptable Manufacturers

1. Ductmate Industries, Duro-Dyne, Metalaire, Semco, Ward Industries.

B. Multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps. Provide in all square turns.

2.5 FLEXIBLE DUCT CONNECTORS

A. Acceptable Manufacturers

1. Ductmate Industries, Duro-Dyne, Vent Fabrics, Ward Industries.

B. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.

C. UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 20 oz per square yard, approximately 6 inches wide, crimped into metal edging strip.

2.6 DUCT ACCESS DOORS

A. Acceptable Manufacturers

1. American Warming, Cesco, Ductmate Industries, Kees, Pottorff, Safe Air/Dowco, Vent Fabrics

B. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards and as indicated.

C. Fabricate rigid and close-fitting doors of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one-inch thick insulation with sheet metal cover.

D. Access doors smaller than 12 inches square may be secured with sash locks.

E. Provide two hinges and two sash locks for sizes up to 18 inches square, three hinges and two compression latches with outside and inside handles for sizes up to 24 x 48 inches. Provide an additional hinge for larger sizes.

F. Access doors with sheet metal screw fasteners are not acceptable.

G. Fire and Smoke Damper Access: Ductwork serving dampers 12”x12” and 12” diameter inside clear dimension and smaller, Rectangular and round, to be provided with a removable ductwork section for damper inspection and maintenance. Removable ductwork section to function without the use of tools.

2.7 DUCT TEST HOLES

A. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent test holes shall be factory fabricated, airtight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

2.8 REMOVABLE DUCT SECTIONS

A. Rectangular Ductwork:

1. Manufacture rectangular access section suitable for duct pressure class. Clamping-type removable ductwork section with draw latch. Access section shall be manufactured to maintain 100 percent of ductwork free area.

2. Allowable leakage: ½ CFM per 100 square feet of ductwork surface area at 2” W.G.

3. Provide size as indicated on drawing. Maximum size is 18”x18”.

4. Material: Galvanized ASTM A527.

5. Flange connection: 18 Gauge galvanized sheet metal construction.

6. Seams: Pittsburgh lock. Access Section: Minimum 26-gauge galvanized ASTM A527 12” long.

7. Clamps: 20 Gauge galvanized with zinc coated draw latch. Gasket profile forms to the inside of clamp and seals the outer edges of the ductwork flanges.

8. Gasket: Neoprene gasket 3/16” x 1 ¼”. Seal seams in accordance with SMACNA HVAC Duct Construction Standard- Metal and Flexible.

9. Liner (Required for insulated duct system): ½" Armaflex internally lined. Top surface even and on the same plane with adjoining ductwork.

10. Approved manufacturers: Langdon, Inc. or approved equal.

B. Round Ductwork:

1. Manufacture round access section suitable for duct pressure class. Clamping type removable ductwork section with draw latch. Access section shall be manufactured to maintain 100 percent of ductwork free are.

2. Allowable leakage: ½ CFM per 100 square feet of ductwork surface area at 2" W.G.

3. Provide size as indicated on drawing. Maximum size is 22" diameter.

4. Material: Galvanized ASTM A527.

5. Flange connection: 90 Degree continuous machine formed flange, provide extended flanges if specified.

6. Seams: (RL-3) Lap and spot weld on 2" interval.

7. Access section: Galvanized sheet metal construction 12" long, 22 Gauge 4" to 12" diameter, 20 Gauge 13" to 22" diameter 12" long.

8. Clamps: 20 Gauge galvanized with zinc coated draw latch and self-centering flange guides. Gasket profile forms to the inside of clamp and seals the outer edges of the ductwork flanges.

9. Gasket: Red silicone sponge gasket. Temperature range 40°F to 400°F. Seal seams in accordance with SMACNS HVAC Duct Construction Standards – Metal and Flexible.

10. Liner (Required for insulated duct systems): ½" Armaflex internally lined. Top surface even and on the same plane with adjoining ductwork.

11. Approved manufacturer: Langdon, Inc. or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions.

B. Provide balancing dampers at points on low pressure supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Use splitter dampers where required.

C. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

D. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.

E. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 8 x 8-inch size for hand access, 18 x 18-inch size for shoulder access, and as indicated.

F. Provide duct test holes where indicated and required for testing and balancing purposes.

G. Provide fire dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

H. Only dynamic fire dampers are to be used unless otherwise specified. Dynamic fire dampers are specifically to be used where heating, ventilating and air conditioning systems are designed to operate with fans on during a fire.

I. Demonstrate re-setting of fire dampers to authorities having jurisdiction and Owner's representative.

END OF SECTION 23 33 00

SECTION 23 37 13 – AIR DISTRIBUTION DEVICES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Diffusers

B. Registers/grilles

C. Spun Aluminum Relief Gravity Ventilators

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

C. Section 233113 - DUCTWORK AND DUCTWORK INSULATION

D. Section 233300 - DUCTWORK ACCESSORIES

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product indicated.

a. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static pressure drop, and noise ratings.

b. Diffuser Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

1.4 REFERENCES

A. ADC 1062 - Certification, Rating and Test Manual.

B. AMCA 500 - Test Method for Louvers, Dampers and Shutters.

C. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

D. ARI 650 - Air Outlets and Inlets.

E. ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Outlets and Inlets.

F. SMACNA - Low Pressure Duct Construction Standard.

1.5 QUALITY ASSURANCE

A. Test and rate performance of air outlets and inlets in accordance with ADC Equipment Test Code 1062 and ASHRAE 70.

B. Test and rate performance of louvers in accordance with AMCA 500.

1.6 REGULATORY REQUIREMENTS

A. Conform to ANSI/NFPA 90A.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturer listed in schedule is for design selection only.

B. Registers, Grilles, and Diffusers

1. Anemostat, Carnes, Hart and Cooley, Krueger, Metalaire, Price, Titus, Tuttle and Bailey.

C. Spun Aluminum Relief Gravity Ventilators

1. Greenheck, Loren Cook, Ruskin and United Enertech.

2.2 RECTANGULAR CEILING DIFFUSERS

A. Square, stamped, multicore type diffuser to discharge air in fixed 360-degree pattern, or adjustable pattern as specified.

B. Provide for surface mount and inverted T-bar where shown. In plaster ceilings, provide plaster frame and ceiling frame.

C. Fabricate of aluminum with baked enamel finish.

D. Provide radial opposed blades damper adjustable from diffuser face for surface mounted unit where specified.

2.3 CEILING GRID CORE EXHAUST AND RETURN REGISTERS/GRILLES

A. Fixed grilles of 1/2 x 1/2 x 1-inch louvers.

B. Fabricate margin frame with countersunk screw mounting or lay-in frame for suspended grid ceilings as shown in schedule on drawings.

C. Fabricate of aluminum with factory clear lacquer finish.

D. Where scheduled provide integral, gang-operated opposed blade dampers with removable key operator, operable from face.

E. All louver-faced grilles shall be provided with pattern controller blades unless scheduled otherwise on the Drawings.

2.4 WALL EXHAUST AND RETURN REGISTERS/GRILLES

A. Streamlined blades, fixed, non-adjustable, horizontal face.

B. Fabricate margin frame with countersunk screw or concealed mounting.

C. Fabricate of steel with 20 gage minimum frames and 22 gage minimum blades, steel and aluminum with 20 gage minimum frame, or aluminum extrusions, with factory baked enamel finish.

2.5 SPUN ALUMINUM RELIEF GRAVITY VENTILATOR - GREENHECK MODEL GRSR

A. General Description:

1. Ventilator is low silhouette for relief applications with natural gravity or negative pressure system

2. Selection based on non-ducted applications

3. Intake unit sizes 8 to 48

4. Performance capability up to 18,200 cubic feet per minute (cfm)

5. Each unit shall bear a permanently affixed manufacture's nameplate containing the model number and individual serial number

B. Hood:

1. Constructed of aluminum

2. Internal structure is constructed of galvanized steel

C. Housing:

1. Curb Cap type: Not Hinged
2. Constructed of aluminum, includes windband and curb cap. Galvanized material is not acceptable
3. Windband to be one piece spun aluminum construction and maintain original material thickness throughout the housing.
4. Windband to include an integral rolled bead for strength
5. Curb cap to have integral deep spun inlet venturi and pre-punched mounting holes to ensure correct attachment to roof.

D. Options/Accessories:

1. Curb Seal:
   a. Rubber seal between fan and the roof curb
2. Roof Curbs:
   a. Type: GPI – Welded, straight sided curb with 2 inches of flashing flange and wood nailer.
   b. Mounted onto roof with fan
   c. Material: Aluminum
   d. Insulation thickness: 1.5 inches
   e. Coating Type: Baked Enamel
3. Dampers:
   a. Type: Gravity
   b. Prevents outside air from entering back into the building when fan is off.
   c. Balanced for minimal resistance to flow.
   d. Galvanized frames with pre-punched mounting holes
4. Finishes:
   a. Type: Baked Enamel. Architect to select color.
   b. Flashing Flange:
   c. Constructed of aluminum
   d. Pre-punched holes for installation without a roof curb
5. Bird Screen:
   a. Construct of aluminum with 1/2” opening sizes
   b. Fitted to the top of the throat and prevents entry of small animals.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Furnish and install where shown on drawings all registers, grilles, diffusers and louvers in accordance with the tabulation in the schedule on drawings.

B. Provide accessories and modifications as indicated in schedule notes.

C. Install items in accordance with manufacturer’s instructions.

D. Install in locations as shown on drawings. Items have been located as shown to provide maximum performance. Coordinate with architectural features and notify Architect/Engineer of any conflicts.

E. Install diffusers to ductwork with airtight connection.

F. Provide accessible balancing dampers on duct take-off to diffusers, and grilles and registers, regardless of whether dampers are specified as part of the diffuser, or grille and register.

END OF SECTION 23 37 13

SECTION 23 81 26 – SPLIT SYSTEM AIR CONDITIONERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes split-system air-conditioning and/or heat-pump units consisting of separate evaporator-fan and compressor-condenser components and refrigerant piping and controls.

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR MECHANICAL WORK

C. See drawings for further conditions, requirements, and schedules.

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product indicated.

a. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

b. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

c. Wiring Diagrams: For power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For all split system air-conditioning units and related components. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: For split system air-conditioning units to include in operation and maintenance manuals.

1.5 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.

B. ASHRAE Compliance:

1. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Standard for Refrigeration Systems."

2. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - " Procedures," and Section 7 - "Construction and System Start-up."

C. ASHRAE/IES Compliance: Applicable requirements in ASHRAE/IES 90.1.

1.6 COORDINATION

A. Coordinate sizes and locations of concrete bases with actual equipment provided.

B. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of split-system air-conditioning units that fail in materials or workmanship within specified warranty period.

1. Warranty Period:

a. For Compressor: Five years from date of Substantial Completion.

b. For Parts: One year from date of Substantial Completion.

c. For Labor: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Trane, Carrier, Daikin, York, Lennox, Rheem.

2.2 INDOOR UNITS

A. Evaporator-Fan Components:

1. Airflow: Up-Flow/Horizontal/Multi-position

2. Chassis: Pre-painted enamel heavy gauge galvanized steel with flanged edges, removable panels for servicing, and insulation on back of panel.

3. Insulation: Faced, glass-fiber duct liner.

4. Condensate Drain Pans:

a. Fabricated with two percent slope in at least two planes to collect condensate from cooling coils (including coil piping connections, coil headers, and return bends) and to direct water toward drain connection.

1) Length: Extend drain pan downstream from leaving face to comply with ASHRAE 62.1.

b. Drain Connection: Located at lowest point of pan and sized to prevent overflow. Terminate with threaded nipple on one end of pan.

c. Pan-Top Surface Coating: Asphaltic waterproofing compound.

5. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and thermal-expansion valve. Comply with ARI 206/110.

6. Electric Coil: Helical, nickel-chrome, resistance-wire heating elements; with refractory ceramic support bushings, automatic-reset thermal cutout, built-in magnetic contactors, manual-reset thermal cutout, airflow proving device, and one-time fuses in terminal box for overcurrent protection.

7. Direct Drive Fan:

a. Statically and dynamically balanced before installation.

b. Resiliently mounted motor.

c. Easily removable for service.

d. Time delay fan relay.

8. Fan Motors:

a. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements.

b. Multi-tapped, multispeed with internal thermal protection and permanent lubrication.

c. Permanently lubricated, ball-bearing motors with built-in thermal-overload protection.

d. Wiring Terminations: Connect motor to chassis wiring with plug connection

9. Air Filtration Section:

a. General Requirements for Air Filtration Section:

1) Comply with NFPA 90A.

2) Minimum MERV according to ASHRAE 52.2.

3) Filter-Holding Frames: Arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lifted out from access plenum.

b. Disposable Panel Filters:

1) Factory-fabricated, viscous-coated, flat-panel type.

2) Thickness: 1 inch.

10. Media: Interlaced glass fibers sprayed with nonflammable adhesive and antimicrobial agent.

2.3 OUTDOOR UNITS

A. Air-Cooled, Compressor-Condenser Components:

1. Casing: Steel, finished with baked enamel in color, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing. Provide coil protection panels.

2. Compressor: Hermetically sealed with crankcase heater and mounted on vibration isolation device. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.

a. Compressor Type: Scroll.

b. Two-speed compressor motor with manual-reset high-pressure switch and automatic-reset low-pressure switch.

c. Refrigerant: R-410A.

d. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins and liquid subcooler. Comply with ARI 206/110.

3. Heat-Pump Components: Reversing valve and low-temperature-air cutoff thermostat.

4. Fan: Aluminum-propeller type, directly connected to motor.

5. Motor: Permanently lubricated, with integral thermal-overload protection.

6. High- and Low-Pressure switches.

7. High-capacity liquid air drier.

8. Low Ambient Kit: Permits operation down to 45 deg F.

2.4 ACCESSORIES

A. Control equipment and sequence of operation are specified in Section 230900 "Instrumentation and Controls for HVAC".

B. Thermostat: To control compressor and evaporator fan, with the following features:

1. Compressor time delay.

2. 7-day/24-hour time control of system stop and start.

3. Liquid-crystal display indicating temperature, set-point temperature, time setting, operating mode, and fan speed.

4. Fan-speed selection including auto setting.

C. Automatic-reset timer to prevent rapid cycling of compressor.

D. Condensate Overflow Switch

E. Refrigerant Line Kits: Annealed-copper suction and liquid lines factory cleaned, dried, pressurized with nitrogen, sealed, and with suction line insulated. Provide in standard lengths for installation without joints, except at equipment connections.

1. This piping shall be capped throughout the construction to prevent any foreign materials from entering the piping. Fittings shall be wrought copper solder joint type. Dry nitrogen shall be bled through piping while joints are being brazed. Joints shall be as follows:

a. Copper to Brass - Silver Solder.

b. Copper to Copper – Silfos.

2. Joints: Copper tubing connections shall be made up with 95/5 tin antimony solder or silfos, in accordance with the recommendations of the manufacturer or as specified hereinafter.

3. Refrigerant Piping Insulation: Armstrong Armaflex insulation 1/2" thick with fittings covered with mitered sections of insulation and sealed with Armaflex 520 adhesive. All insulation on outdoor installation shall be additionally protected with two (2) coats of Armaflex WB pigmented acrylic latex finish.

a. Comply with ASTM C 534/C 534M, Type I.

F. Condensate Drain Piping

1. Copper Tubing: ASTM B88, Type L, M or DWV hard drawn.

a. Fittings: ANSI/ASME B16.18 bronze sand castings, ANSI B16.22 wrought copper, ANSI/ASME B16.23 cast brass, or ANSI/ASME B16.29 solder wrought copper.

b. Joints: ASTM B32, solder, Grade 95TA or grooved joints with EPDM gaskets.

2. PVC Pipe: ASTM D1785, Schedule 40 and Schedule 80.

a. Fittings: ASTM D2466 for Schedule 40 pipe, or ASTM D2467 for Schedule 80 pipe.

b. Joints: ASTM D2564 and ASTM D2855, solvent weld.

3. Condensate Drain Piping Insulation: Flexible Elastomeric Insulation: 1/2” closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C534, Type I for tubular materials.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units' level and plumb.

B. Install evaporator-fan components using manufacturer's standard mounting devices securely fastened to building structure.

C. Install roof-mounted, compressor-condenser components on equipment supports as specified. Anchor units to supports with removable, cadmium-plated fasteners.

D. Equipment Mounting:

1. Install ground-mounted, compressor-condenser components on cast-in-place concrete equipment base(s).

E. Install and connect pre-charged refrigerant tubing to component's quick-connect fittings. Install tubing to allow access to unit.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Where piping is installed adjacent to unit, allow space for service and maintenance of unit.

C. Duct Connections: Duct installation requirements are specified in Section 233113 "Ductwork and Ductwork Insulation." Drawings indicate the general arrangement of ducts. Connect supply and return ducts to split-system air-conditioning units with flexible duct connectors. Flexible duct connectors are specified in Section 233300 "Ductwork Accessories."

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.

2. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.

3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Remove and replace malfunctioning units and retest as specified above.

E. Prepare test and inspection reports.

3.4 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 23 81 26

SECTION 23 81 27 – MINI-SPLIT SYSTEM AIR CONDITIONER

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Fan coil unit

B. Outdoor unit

C. Refrigerant piping

D. Controls

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISION FOR MECHANICAL WORK

C. See drawings for further conditions, requirements, and schedules.

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product indicated.

a. Include rated capacities, operating characteristics, and furnished specialties and accessories. Include performance data in terms of capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.

b. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

c. Wiring Diagrams: For power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For all split system air-conditioning units and related components. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: For split system air-conditioning units to include in operation and maintenance manuals.

1.5 WARRANTY

A. Provide five-year warranty on compressors.

PART 2 - PRODUCTS

2.1 DUCTLESS SPLIT SYSTEMS

A. Provide self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, controls, air filter, refrigerant cooling coil and outdoor package containing compressor, condenser coil and condenser fan.

2.2 ACCEPTABLE MANUFACTURERS

A. Daikin, Trane, Carrier, Mitsubishi, Friedrich.

2.3 INDOOR UNIT

A. The indoor unit shall be completely factory assembled and tested. Units shall have factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate drain pan, self-diagnostics, auto restart function, 3-minute fused time delay and test run switch. The unit shall have an auto-swing louver which ensures efficient air distribution, which closes automatically when the unit stops. The front grille shall be easily removed for cleaning.

B. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.

C. Both refrigerant lines shall be insulated from the outdoor unit.

D. The indoor units shall be equipped with a return air thermistor.

E. Unit Cabinet

1. The indoor unit shall have a white, “flat screen” finish.

2. The drain and refrigerant piping shall be accessible from six(6) positions for flexible installation (right side, right back, right bottom, left side, left back and left bottom).

3. The cabinet shall be supplied with a mounting plate to be installed onto a wall for securely mounting the cabinet.

F. Fan

1. The evaporator fan shall be an assembly consisting of a direct-driven fan by a single motor.

2. The fan shall be statically and dynamically balanced and operate on a motor with permanent lubricated bearings.

3. An auto-swing louver for adjustable air flow (vertically) shall be standard.

G. Coil

1. The evaporator coil shall be a nonferrous, aluminum fin on copper tube heat exchanger.

2. All tube joints shall be brazed with silver alloy or phoscopper.

3. All coils will be factory pressure tested.

4. Condensate pad shall be located in unit.

5. Provide with a remote condensate pump for condensate removal. Power from unit.

H. Filter

1. The return air filter provided will be a mildew proof, removable and washable filter.

I. Refrigerant Piping

1. All refrigeration piping shall be Type ACR hard drawn copper tubing and shall be precapped, precleaned and dry nitrogen charged at the factory. This piping shall be capped throughout the construction to prevent any foreign materials from entering the piping. Fittings shall be wrought copper solder joint type. Dry nitrogen shall be bled through piping while joints are being brazed. Joints shall be as follows:

a. Copper to Brass - Silver Solder

b. Copper to Copper - Silfos.

2. Joints: Copper tubing connections shall be made up with 95/5 tin antimony solder or silfos, in accordance with the recommendations of the manufacturer or as specified hereinafter.

3. Refrigerant Piping Insulation: Armstrong Armaflex insulation 1/2" thick with fittings covered with mitered sections of insulation and sealed with Armaflex 520 adhesive. All insulation on outdoor installation shall be additionally protected with two (2) coats of Armaflex WB pigmented acrylic latex finish.

J. Condensate Drain Piping

1. Copper Tubing: ASTM B88, Type L, M or DWV hard drawn.

a. Fittings: ANSI/ASME B16.18 bronze sand castings, ANSI B16.22 wrought copper, ANSI/ASME B16.23 cast brass, or ANSI/ASME B16.29 solder wrought copper.

b. Joints: ASTM B32, solder, Grade 95TA or grooved joints with EPDM gaskets.

2. PVC Pipe: ASTM D1785, Schedule 40 and Schedule 80.

a. Fittings: ASTM D2466 for Schedule 40 pipe, or ASTM D2467 for Schedule 80 pipe.

b. Joints: ASTM D2564 and ASTM D2855, solvent weld.

3. Condensate Drain Piping Insulation: Flexible Elastomeric Insulation: 1/2” closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C534, Type I for tubular materials.

K. Controls

1. The unit shall have a wall mounted remote infra-red controller capable to operate the system.

2. The infrared remote controller shall consist of an On/Off Power switch, Mode Selector, Fan Setting, On/Off Timer Setting, Temperature Adjustment.

a. On/Off switch power the system on or off mode.

b. Mode selector shall operate the system in auto, cool, heat, fan, or dry operation.

c. Fan setting shall provide high, medium, or low fan speed.

d. On/Off timer is used for automatically switching the unit on or off.

e. Temperature adjustment allows for the increase or decrease of the desired temperature.

2.4 OUTDOOR UNIT

A. Unit Cabinet

1. The outdoor unit shall be completely weatherproof and corrosive resistant.

2. The unit shall be constructed from rust-proofed mild steel panels coated with a baked enamel finish.

B. Fan

1. The fan shall be a direct drive, propeller type fan.

2. The motor shall be inverter drive, permanently lubricated type bearings, inherent.

3. A fan guard is provided on the outdoor unit to prevent contact with fan operation.

C. Coil

1. The outdoor coil shall be nonferrous construction with corrugated fin tube.

2. Refrigerant flow from the condenser will be controlled via a metering device.

D. Compressor

1. The compressor shall be a rotary swing inverter-driven compressor.

2. The compressor shall have an internal thermal overload.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all components in accordance with manufacturer's recommendation.

B. Install all components in a manner to provide clearances required for proper operation and maintenance.

C. Furnish equipment with charge of refrigerant and oil.

D. Coordinate electrical connections required.

3.2 DEMONSTRATION

A. Provide owner's maintenance personnel training as required to adjust, operate, and maintain equipment.

END OF SECTION 23 81 27

SECTION 23 82 39 – ELECTRIC UNIT HEATERS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Electric Ceiling Mounted Heaters

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

C. See drawings for further conditions, requirements, and schedules.

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product

a. Include rated capacities, operating characteristics, furnished specialties, and accessories.

b. Wiring Diagrams: Power, signal, and control wiring.

c. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1.4 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For all electric unit heaters and related components. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: For electric unit heaters to include in operation and maintenance manuals.

1.5 QUALITY ASSURANCE

A. All electrical components and accessories shall be listed and labeled per requirements of NFPA 70, Article 100.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Berko, Chromalox, Markel, Trane, TPI/Reddi and Qmark.

2.2 ELECTRIC CEILING MOUNTED HEATERS

A. Heater Section: The heater section shall consist of a 20-gauge steel chassis on which are mounted the heating elements, fan motor and blade, fan control, thermal cutout, and 3-pole contactor. Heater section shall be completely prewired.

B. Heater Elements: The heating elements shall be guaranteed for five years and shall be of non-glowing design consisting of 80/20 NiCh resistance wire, enclosed in a steel sheath, to which steel plate fins are brazed. The elements shall cover the entire air intake area to ensure uniform heating of all discharged air.

C. Motor and Controls: The fan motor shall be impedance-protected, permanently lubricated and with totally enclosed rotor. Fan control shall be bi-metallic, snap-action type and shall

activate fan and heating element when the thermostat calls for heat and continue to operate the fan after the thermostat is satisfied and until all heated air has been discharged. Thermal cutout shall be bi-metallic snap-action type designed to automatically shut off heater in the event of overheating and reactivate the heater when temperature returns to normal.

D. Operational Controls: Disconnect switch, and all interlock relays shall be installed within the heater enclosure.

E. Recess Enclosure

1. The box shall be designed for duty as a recessed rough-in box in masonry, T-Bar, or frame ceiling construction. The back box shall be 20-gauge galvanized steel and shall contain knockouts through which field wiring leads are brought. Enclosure to recess into a maximum 7 inches of ceiling space. An independent support system shall be used for T-Bar installation.

2. The louvered recess faceplate shall be of 20 gauge cold rolled steel, phosphatized then electrostatically painted Antique White by a baked enamel process.

F. Surface Enclosure

1. The surface mounting plate shall be designed for duty as a rough-in box or masonry, T-Bar, or frame ceiling construction. The surface mounting plate shall be 20-gauge galvanized steel and shall contain knockouts through which field wiring leads are brought. Enclosure to extend a maximum of 16 inches into the heated space. An independent support system shall be used for T-Bar installation.

2. The louvered surface wrapper shall be a contoured aluminum extrusion and 20-gauge sheet metal combination with rounded corners. The surface wrapper shall be electrostatically painted Antique White by a baked enamel process.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all units and accessories in accordance with manufacturer’s recommendations.

B. Install all units in a manner to provide clearances for proper operation accessibility and maintenance.

C. Coordinate electrical connections required.

3.2 DEMONSTRATION

A. Provide Owner’s maintenance personal training as required to adjust, operate, and maintain heaters.

END OF SECTION 23 82 39

SECTION 26 05 48 – SEISMIC AND WIND CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Refer to General Requirements Specifications, Section 26 05 00.

B. Section Includes:

1. Elastomeric isolation pads.
2. Restraints - rigid type.
3. Restraints - cable type.
4. Restraint accessories.
5. Post-installed concrete anchors.
6. Concrete inserts.

1.2 SCOPE

A. Provide positive seismic- and wind-load restraint in accordance with the requirements of this section in order to maintain the integrity of non-structural components of the building so they remain safe and functional in case of seismic and wind events.

B. The design of the seismic- and wind-load restraints is delegated to the contractor. The design shall be prepared, signed, and sealed by a qualified structural professional engineer licensed in the state where the project is located.

C. The following components/systems have a component importance factor of 1.5:

1. Emergency Lighting

1.3 SUBMITTALS

A. Provide product data for all products included in this scope of work.

1. Provide performance data illustrating size, physical appearance and other characteristics of the products.
2. Include rated load capacity for each seismic- and wind-load-restraint device.
3. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
4. Annotate types and sizes of seismic restraints and accessories, complete with listing markings or report numbers and load rating in tension and compression as evaluated by UL product listing or an agency acceptable to authorities having jurisdiction.
5. Annotate to indicate application of each product submitted and compliance with requirements.
6. The manufacturer of the equipment required to be restrained shall submit seismic performance certificates. Include the following:
    a. Basis for certification:
        1) Indicate whether withstand certification is based on actual test of assembled components or on calculation.
    b. Dimensioned outline drawings of equipment unit:
        1) Identify center of gravity and locate and describe mounting and anchorage provisions.

c. Detailed description of equipment anchorage devices on which certification is based and their installation requirements.

d. Indicate the equipment is certified to be durable enough to:

1) Structurally resist the design forces (non-essential equipment) and/or

2) Will remain functional after the seismic event (essential equipment).

B. Shop Drawings:

1. Detail fabrication and assembly of equipment bases.

2. Show coordination of seismic and wind-load bracing for components with other systems and equipment in the vicinity, including other supports and seismic restraints.

C. Delegated Design Submittal for each Seismic-Restraint Device: Signed and sealed by qualified structural professional engineer.

1. For each seismic-restraint device that is required by the contract documents, submit the following:

a. Seismic Restraints: Select seismic restraints complying with performance requirements, design criteria, and analysis data.

b. Post-Installed Concrete Anchors and Inserts: Include calculations showing anticipated seismic loads. Include certification that device is approved by qualified testing laboratory for seismic reinforcement use.

c. Seismic Design Calculations: Submit input data and loading calculations.

D. Delegated Design Submittal for Each Wind-Load Protection Device: Signed and sealed by qualified structural professional engineer.

1. For each wind-load protection device that is required by the contract documents, submit the following:

2. Wind-Load Restraint: Select wind-load restraints complying with performance requirements, design criteria, and analysis data.

3. Post-Installed Concrete Anchors and Inserts: Include calculations showing anticipated wind loads. Include certification that device is approved by qualified testing laboratory for reinforcement use.

4. Wind-Load Design Calculations: Submit static and dynamic loading calculations.

E. Seismic- and Wind-Load-Restraint Detail Drawings: Signed and sealed by qualified structural professional engineer.

1. Design Analysis: To support selection and arrangement of seismic and wind-load restraints. Include calculations of combined tensile and shear loads.

2. Details: Indicate fabrication and arrangement. Detail attachments of restraints to restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.

3. Coordinate seismic-restraint details with wind-load details required for equipment mounted outdoors.

1.4 OPERATION AND MAINTENANCE MANUALS

A. Provide test and inspection reports.

1.5 QUALITY ASSURANCE

A. Product Listing, Preapproval, and Evaluation Documentation: By UL or an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

B. All seismic and wind restraint systems shall be by a single manufacturer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Acceptable Manufacturers:

1. Kinetics Noise Control, Inc.

2. Approved equivalents.

B. Refer to the Architectural and Structural drawings and specifications for site-specific seismic and wind load design criteria.

C. Seismic- and Wind-Load-Restraint Device Load Ratings: Devices to be tested and rated in accordance with applicable code requirements and authorities having jurisdiction. Devices to be listed by a nationally recognized third party that requires periodic follow-up inspections and has a listing directory available to the public. Provide third-party listing by one or more of the following: UL product listing or an agency acceptable to authorities having jurisdiction.

D. Consequential Damage: Provide additional seismic and wind-load restraints for suspended components or anchorage of floor-, roof-, or wall-mounted components so that failure of a non-essential or essential component will not cause failure of any other essential building component.

E. Fire/Smoke Resistance: Seismic- and wind-load-restraint devices that are not constructed of ferrous metals must have a maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested by qualified testing laboratory in accordance with ASTM E84 or UL 723, and be so labeled.

F. Component Supports:

1. Load ratings, features, and applications of reinforcement components must be based on testing standards of qualified testing laboratory.

2.2 ELASTOMERIC ISOLATION PADS

A. Elastomeric Isolation Pads:

1. Fabrication: Single or multiple layers of sufficient durometer stiffness for uniform loading over pad area.

2. Size: Factory or field cut to match requirements of supported equipment.

3. Pad Material: Oil and water resistant with elastomeric properties. Neoprene rubber, silicone rubber, or other elastomeric material.

4. Surface Pattern: Non-slip pattern

5. Load-bearing metal plates adhered to pads.

2.3 RESTRAINTS - RIGID TYPE

A. Description: Shop- or field-fabricated bracing assembly made of ANSI/AISI S110-07-S1 slotted steel channels, ANSI/ASTM A53/A53M steel pipe, or other rigid steel brace

member. Includes accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; rated in tension, compression, and torsion forces.

2.4 RESTRAINTS - CABLE TYPE

A. Seismic- and Wind-Load-Restraint Cables: ASTM A1023/A1023M galvanized or ASTM A603 galvanized-steel cables. End connections made of steel assemblies with thimbles, brackets, swivel, and bolts designed for seismic-restraining cable service; with fittings attached by means of poured socket, swaged socket, or mechanical (Flemish eye) loop.

B. Restraint cable assembly and cable fittings must comply with ASCE/SEI 19. Cable fittings and complete cable assembly must maintain the minimum cable breaking force. U-shaped cable clips and wedge-type end fittings do not comply and are unacceptable.

2.5 RESTRAINT ACCESSORIES

A. Hanger-Rod Stiffener: Reinforcing steel angle clamped to hanger rod. Non-metallic stiffeners are unacceptable.

B. Hinged and Swivel Brace Attachments: Multifunctional steel connectors for attaching hangers to rigid channel bracings and restraint cables.

C. Bushings for Floor-Mounted Equipment Anchor Bolts: Neoprene bushings designed for rigid equipment mountings and matched to type and size of anchor bolts and studs.

D. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings and matched to type and size of attachment devices used.

E. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

2.6 POST-INSTALLED CONCRETE ANCHORS

A. Mechanical Anchor Bolts:

1. Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength for anchor and as tested according to ASTM E488/E488M.

B. Adhesive Anchor Bolts:

1. Drilled-in and capsule anchor system containing PVC or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E488/E488M.

C. Provide post-installed concrete anchors that have been prequalified for use in seismic and wind-load applications.

1. Prequalify post-installed anchors in concrete in accordance with ACI 355.2 or other approved qualification testing procedures.

2. Prequalify post-installed anchors in masonry in accordance with approved qualification procedures.

2.7 CONCRETE INSERTS

A. Provide preset concrete inserts that are seismically prequalified in accordance with ICC-ES AC446 testing.

B. Comply with MSS SP-58.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Install seismic and wind restraint devices per the manufacturer's requirements and applicable building codes.

2. Isolated and restrained electrical systems located on roofs must be attached to the structure. Supports/sleepers that are not attached to the structure will not be acceptable.

3. Do not brace or support equipment to separate portions of the structure that may act differently in response to an earthquake. For example, do not connect a Transverse restraint to a wall and then a longitudinal restraint to either a floor/ceiling/roof at the same braced location.

4. Housekeeping Pads

a. Coordinate housekeeping pads supporting seismically rated equipment.

1) Coordinate size, thickness, doweling, and reinforcing of concrete equipment housekeeping pads and piers with seismic restraint devices manufacturer to ensure adequate space, embedment and prevent edge breakout failures.

2) Pads must be adequately reinforced and adequately sized for proper installation of equipment anchors.

B. Seismic Restraint Application

1. General:

a. Provide vertical braces to stiffen hanger rods and prevent buckling per seismic restraint manufacturer's design. Clamp vertical brace to hanger rods. Requirements apply equally to hanging equipment. Do not weld vertical braces to hanger rods.

1) Rod stiffener clamps are required where the hanger rod exceeds the maximum length shown in the seismic calculation sheets. They are only required at restraint locations.

b. If a specific attachment for seismic restraint is not indicated for suspended electrical systems, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

1) Seismic restraint connections are not be connected to the bottom chord of steel joists or the bottom flange of steel beams.

c. Seismically rated beam clamps are required where welding to or penetrations to steel beams are not approved.

d. Where rigid restraints are used on electrical systems, the support rods for the systems at restraint locations must be supported by anchors rated for seismic use. Post-installed concrete anchors must be in accordance with ACI 355.2.

e. Adjust restraint cables so that there is no visible slack. The cable is not to support the weight during normal operation.

f. Drilled or power driven anchors or fasteners shall not be permitted for use with seismic control measures.

2. Concrete Anchor Bolts:

a. Identify the position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid pre- or post-tensioned tendons, electrical and telecommunications conduit, and gas lines.

b. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.

c. Protect threads of mechanical anchors from damage during anchor installation.

d. Adhesive anchors:

1) Clean holes to remove loose material and drilling dust per manufacturer's instructions prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.

e. Set anchors to manufacturer's recommended torque, using a torque wrench.

f. Install zinc-coated steel anchors for interior and stainless steel anchors for exterior applications.

3. Electrical systems:

a. All electrical systems are to be restrained in accordance with the applicable building codes.

1) All electrical systems assigned a component importance factor of 1.5 shall require seismic restraints.

2) Electrical systems located in Seismic Design Categories D, E, F, assigned a component importance factor of 1, and do not meet the exemptions listed in the building code, shall require seismic restraints.

3) All electrical systems that are exposed to wind (i.e. located exterior to the building and above grade) shall be restrained from the effects of wind.

b. Equipment Restraints:

1) Seismically restrain equipment indicated on the schedule. Install fasteners, straps and brackets as required to secure equipment.

2) Install neoprene grommet washers or fill gap with epoxy on equipment anchor bolts where clearance between anchor and equipment support hole exceeds .125 inches.

3) Rigid mounted equipment:

a) Anchor floor and wall mounted equipment to the structure as per the stamped seismic certifications/drawings.

b) Suspended equipment shall be restrained using seismic cable restraints, or struts, and hanger rods as per the stamped seismic certifications/drawings.

c. Seismically restrain all electrical components listed below, unless otherwise indicated on the drawings, using seismic cable restraints:

1) Seismically restrain all conduit 2.5 inches in diameter and larger.

2) Seismically restrain all conduit, bus ducts, or cable trays that are supported on trapeze bars, and that have a total weight greater than 10 lb/ft. This total weight includes not only the conduit, bus duct, or cable trays, but also includes the trapeze bars as well.

a) It is necessary for the conduit, bus ducts, and cable trays to be attached to the trapeze bars sufficiently to resist the design horizontal seismic forces, both traverse (T) and longitudinal (L). Secure with clamps approved for the application.

d. Cable trays:

1) Cables installed in cable tray shall be strapped either individually or in bundles to the cable tray at regular intervals to ensure that the seismic forces are transferred properly to the restraint points.

e. Brace a change in direction longer than 12 feet.

f. Install restraint cables so they do not bend across edges of adjacent equipment or building structure. Tie back to structure at 45 degrees to structure.

g. Longitudinal restraints for single conduit support shall be attached rigidly to the conduit, not the conduit hanger.

h. Where conduit, bus ducts, cable tray sizes reduce below required dimensions noted in 3.1, B, 4, b, the final restraint shall be installed at the transition location.

i. Install flexible connectors where adjacent sections or branches are supported by different structural elements, and where the connections terminate with connection to equipment that is anchored to a different structural element from the one supporting the connections as they approach equipment.

3.2 FUNCTIONAL TESTING

A. Provide special inspections as required by the building code.

B. Refer to the architectural and structural drawings and specifications for required testing and inspections.

END OF SECTION 26 05 48

SECTION 28 13 00 – SECURE ENTRY SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Refer to General Requirements Specifications, Section 260500

B. This section includes items pertaining to the secure entry system(s), including but not limited to the following:

1. Master Stations and Substations
2. Cameras
3. Intercoms
4. Door Release
5. Power Supplies
6. Cabling

1.2 SCOPE

A. General Description

1. Provide a system to supervise and control access to the secured entry of the facility. The system shall include a master station and substation(s) as shown the drawings. The system shall provide audio communication and video between the master station and substation(s). If deemed appropriate, the occupant can remotely unlock the secured door and permit the visitor's entry.

B. Provide a complete and operational system as described within this specification and as shown on the contract drawings.

C. All miscellaneous items and accessories required for a complete and operational system shall be provided whether or not each item is explicitly mentioned in these specifications or shown on the contract drawings.

1. The contractor is responsible for providing all line voltage circuits necessary for the operation of the system.

1.3 SUBMITTALS

A. Product Data

1. Provide the manufacturer's product data sheets for each component to be utilized on this project.

B. Shop Drawings

1. Provide shop drawings indicating the following:

a. Location of equipment and devices.

b. Interconnections between equipment and devices.

c. Riser/Wiring Diagrams.

C. Qualifications Data

1. Person(s) performing the installation, programming and service of this system shall have, at a minimum, completed the manufacturer's training program(s) for the respective system to be installed. Provide certificate(s) of completion from the system manufacturer for person(s) performing this work.

1.4 OPERATION AND MAINTENANCE MANUALS

A. Provide functional test results and certifications.

B. Provide contact information. The contact information shall include names, physical addresses, phone numbers and email addresses of the following:

1. Installing company

2. Specific contact person(s) for technical assistance, service and maintenance.

3. Emergency contact information for after-hours technical assistance, service and maintenance.

C. Provide a copy of the owner training sign-in sheet.

D. Provide a digital copy of the recording from the owner training session.

E. Provide a copy of the manufacturer's warranty.

F. Provide a complete material and equipment list with corresponding part/model numbers.

G. Provide an operation/user manual detailing operating instructions, programming instructions, maintenance requirements and trouble-shooting procedures.

1.5 QUALITY ASSURANCE

A. All equipment supplied for this system shall be the product of a single manufacturer, unless specifically noted otherwise.

B. Installing Contractor:

1. The contractor shall be a manufacturer's authorized representative, trained and approved for the installation of this system.

2. The contractor shall have been in business for a minimum of 5 consecutive years prior to the date of this contract.

3. The contractor shall have and maintain a fully equipment service department capable of providing inspections, service, and repairs for the system.

C. All materials, unless otherwise specified, shall be new and free from any defects.

1.6 WARRANTY

A. The manufacturer shall warranty and agree to repair or replace all components that fail due to defects in material or workmanship for a period of 5 years starting from the date of substantial completion.

1. The contractor shall be responsible for repairing or replacing all components that fail within one year of the date of substantial completion. The contractor will be financially responsible for the cost of material and labor for this period.

2. The remainder of the warranty period shall apply to material costs only. Labor costs are excluded after the first year.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. AIPhone Corporation

1. IX Series IP Video Intercom System:

a. IX-MV7-HB Series IP Video Master Station
b. IX-DV IP Video Door Station(s)

PART 3 - EXECUTION

3.1 COORDINATION

A. Coordinate the installation with the door hardware installer as necessary to provide the remote door/lock release functions.

3.2 INSTALLATION

A. Cabling

1. Cabling shall be installed in a similar manner as the communication cabling. Refer to specification sections Raceways and Boxes 260533, Communications Equipment Room 271100, Communications Backbone Cabling 271300, Communications Horizontal Cabling, and the contract drawings for additional information.

a. All cabling shall be installed in a minimum 3/4” conduit.

1) Cabling may be installed in open-air where located above concealed, accessible ceiling spaces.

2. Cabling shall not be installed on or through the ceiling structure.

3. All cabling shall be labeled using computer printed labels. Provide self-laminating adhesive labels made of vinyl or polyester that flex as cables are bent.

a. Each cable shall be labeled within 4 inches of each termination.

b. The label shall identify the location (room name and number) and type of device(s) the cables are connecting (Ex: Vestibule 123, Entry Substation).

4. Splicing of cable is not permitted except in terminal cabinets and equipment housing.

B. Refer to the Division 26 specifications for the installation requirements of line voltage circuits, wiring devices, etc.

C. Provide all necessary cutting and drilling of walls, floors, ceilings, etc. for the installation of the new work. No structural components shall be cut or modified unless specifically noted and/or approved by the architect/engineer.

D. All work shall be protected during construction to prevent damage.

1. Components shall not be installed until the building is dried-in.

2. If the construction schedule requires the installation of the electronic components while dust producing activities are ongoing, the contractor shall protect the equipment with plastic or other means to prevent damage.

a. The equipment shall be thoroughly cleaned after the dust producing activities have ceased.

E. Provide all programming, adjustments, etc.

3.3 FUNCTIONAL TESTING

A. Provide functional testing to demonstrate to the Owner/Engineer the systems function as specified.

3.4 OWNER TRAINING

A. Owner training shall not occur until the system is fully operational, software programmed, and all punch list items are completed. If 3rd party commissioning is provided for the project, the owner training shall not occur until the resolution tracking form is completed.

B. The presenter/trainer shall be a manufacturer's authorized representative familiar with the system(s).

C. The contractor shall provide the following at a minimum for owner training:

1. Sign-in sheet documenting the attendees and presenter's names and contact information.

    a. Include the date and time the training occurred.

2. A copy of the operation manual for the system shall be provided to each attendee.

    a. The operation manual shall be reviewed with the attendees in conjunction with the physical demonstration of the system.

3. Two (2) hours total of in-service training.

4. The training shall be digitally recorded (audio and video). A copy of the recording shall be included with the O&M manual.

END OF SECTION 28 13 00

SECTION 311000 - SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clearing and protection of vegetation.

B. Removal of existing debris.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 015713 - Temporary Erosion and Sediment Control.

D. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.

E. Section 312200 - Grading: Topsoil removal.

F. Section 312200 - Grading: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

G. Section 312323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

H. Section 312323 - Fill: Filling holes, pits, and excavations generated as a result of removal operations.

I. Section 329300 - Plants: Relocation of existing trees, shrubs, and other plants.

J. Section 329300 - Plants: Pruning of existing trees to remain.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: As specified in Section 312200 - Grading

PART 3 EXECUTION

3.01 SITE CLEARING

A. Comply with other requirements specified in Section 017000.

B. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

3.02 EXISTING UTILITIES AND BUILT ELEMENTS

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Protect existing structures and other elements that are not to be removed.

3.03 VEGETATION

A. Scope: Remove trees, shrubs, brush, and stumps in areas to be covered by building structure, paving, playing fields, lawns, and planting beds.

B. Do not begin clearing until vegetation to be relocated has been removed.

C. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to vegetation to remain:
   1. Around trees to remain within vegetation removal limits; locate no closer to tree than at the drip line.
   2. Around other vegetation to remain within vegetation removal limits.

D. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
   1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
   2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
   3. Existing Stumps: Treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
   4. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.
   5. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and smooth enough not to constitute a hazard to pedestrians.

E. Dead Wood: Remove all dead trees (standing or down), limbs, and dry brush on entire site; treat as specified for vegetation removed.

F. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.

G. Existing Trees shall be protected. The following table shall be used to assess damages if trees are removed without written permission.

H. Cross sectional areas of trees and their base value based on $48 per square inch.

1.		Cross Section	Base Value
2.	Diameter	Square Inches	$48/Sq. In.
3.	6	28.3	$1,358
4.	12	113.1	$5,429
5.	24	452.4	$21,715
6.	26	530.9	$25,483
7.	28	615.8	$29,558
8.	30	706.9	$33,931
9.	32	804.3	$38,606
10.	34	907.9	$43,579
11.	36	1017.9	$48,859
12.	38	1134.1	$54,437
13.	40	1256.6	$60,336
14.	48	1809	$86,832

3.04 DEBRIS

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 312000 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. A report of geotechnical services was completed and prepared for the site of this Work and is included in the specifications.

C. General Contractor to engage a qualified geotechnical engineering testing agency to perform quality testing and Special Inspections during construction, per this Section.

D. Section Includes:

This Section includes all work; labor, machinery, disposal and replacement of unsuitable soil, removal of rock and any materials encountered to plan bottom depth/ subgrade for all earthwork related items. These items shall include, but are not limited to, earthwork procedures for drives, parking lots, pavements, building foundations, footings, synthetic turf systems, caissons, building slabs, utility trenches, etc.

All excavation and fill work shall be considered as unclassified regarding type and condition with costs reflecting all expenses necessary to achieve plan bottom depth/ subgrade and all grading effort as shown on the drawings. Plan bottom depth is defined as the lowest elevation of excavation or modification required to construct work shown on drawings and outlined in specifications. This includes bottom of excavation / modification for foundations, utilities, roads, parking, sidewalks, required unsuitable soils undercutting, and/or rock removal, and lime stabilization as indicated or noted on drawings or geotechnical report.

No change in the contract price will be considered for any materials encountered and/or required to be removed or replaced to achieve plan bottom depth/ subgrade for the earthwork requirements.

The following is a list of the items, which are included as a part of this work:

1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns, and plantings.
2. Excavating and backfilling for buildings and structures.
3. Drainage course for slabs-on-grade.
4. Subbase course for concrete walks and pavements.
5. Base course for asphalt paving.
6. Subsurface drainage backfill for walls and trenches.
7. Excavating and backfilling trenches within building lines.
8. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.
9. Excavating and backfilling for exterior storm drainage beyond the building limits.
10. Placement of topsoil as shown on the plans.

1.2 UNIT PRICES

A. Work of this Section can be affected by unit prices for items added or deleted from the base bid scope

B. Quantity allowances for earth moving are included in Division 1 Section "Allowances."

C. Rock Measurement: Volume of actual rock removed, measured in original position, but not to exceed the following. Unit prices for rock excavation include replacement with approved materials.

1. 24 inches (600 mm) outside of concrete forms other than at footings.
2. 12 inches (300 mm) outside of concrete forms at footings.
3. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.
4. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
5. 6 inches (150 mm) beneath bottom of concrete slabs-on-grade.
6. 6 inches (150 mm) beneath pipe in trenches, and the greater of 24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength 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. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Sub-Base Course: Aggregate layer placed between the subgrade course base courses. Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water

D. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

E. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill. Testing by geotechnical engineer prior to delivery to the site is required.

F. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

G. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade 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 for unit prices changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.

3. Unauthorized Excavation: Excavation below subgrade 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.

H. Fill: Soil materials used to raise existing grades.

I. Plan bottom depth: Plan bottom depth is defined as the lowest elevation of excavation indicated on the drawings or otherwise noted. This includes bottom of excavations for foundations, utilities, roads, parking, sidewalks or required undercutting as indicated or noted on drawings or geotechnical report. Contractor shall include in bid all labor and materials required to achieve plan bottom depths as indicated.

J. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m) for footing, trench, and pit excavation that that exceed a standard penetration resistance of [100 blows/2 inches (97 blows/50 mm)] when tested by a geotechnical testing agency, according to ASTM D 1586 and cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- (1065-mm-) wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp (103-kW) flywheel power with bucket-curling force of not less than 28,700 lbf (128 kN) and stick-crowd force of not less than 18,400 lbf (82 kN) with extra-long reach boom; measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp (172-kW) flywheel power and developing a minimum of 47,992-lbf (213.3-kN) breakout force with a general-purpose bare bucket; measured according to SAE J-732.

K. 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.

L. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

M. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, structures, drainage fill, drainage course, or topsoil materials.

N. 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.

O. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch (25 mm) or larger in any dimension, and other extraneous materials harmful to plant growth.

1. Topsoil Source: Reuse surface soil stockpiled off site and /or amend existing surface soil to produce topsoil. Supplement with imported topsoil when on-site quantities are insufficient to achieve the grading effort as shown on the drawings. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth prior to placement on site.

P. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

A. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 698 or ASTM D 1557 as required by Geotechnical Report.
3. All reports are to be signed by a Professional Engineer with licenses to practice in the state of this project

1.5 QUALITY ASSURANCE

A. Blasting: Not allowed

B. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

C. Pre-excavation Conference: Conduct conference at Project site

D. Codes and Standards: Perform excavation work in compliance with applicable requirements of authorities having jurisdiction. Prepared aggregate subbase shall comply with the Kentucky Transportation Cabinet (KYTC) standard specifications, latest edition and with the local governing regulations, if more stringent than herein specified.

1.6 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving 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 Owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Architect.

C. Utility Locator Service: Notify “Call 811 Before You Dig" for the area where Project is located before beginning earth moving operations. Contact owner for location of private utilities.

D. Do not commence earth-moving operations until temporary erosion- and sedimentation-control measures, specified and shown on Erosion Sediment Control Plan are in place.

E. Do not commence earth-moving operations until plant-protection measures specified and shown on the drawings are in place.

F. 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:

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. Contact utility-locator service for area where Project is located before excavating.
4. Locate existing underground utilities in areas of excavation work. If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.
5. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to the utility owner's satisfaction at no cost to the Owner.

G. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

H. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other is digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
8. Do not direct vehicle or equipment exhaust towards protection zones.
9. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

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: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487 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. CL and CH soils placed as recommended by project Geotechnical Engineer.

1. CL and CH soils not meeting the requirements above will be considered as satisfactory soils when modified in accordance with the construction drawings, Kentucky Transportation standard specifications Section 208 "Chemically Stabilized Roadbed", and upon review by the Geotechnical Engineer.

D. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups not approved or recommended by Geotechnical Engineer.

1. Unsatisfactory soils also include satisfactory soils not maintained within 3 percent of optimum moisture content at time of compaction.

2. All unsatisfactory soil beneath pavement, building floor slabs, and interior/exterior footings shall be remediated in accordance with the construction drawings and the Project Geotechnical Engineer recommendations. The Geotechnical Engineer shall monitor all soil remediation actions including excavation, proof rolling, soil placement, and compaction.

E. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

F. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve. Or as recommended by the project Geotechnical Engineer

H. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

I. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch (25-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.

K. Sand: ASTM C 33; fine aggregate.

L. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 157 lbf (700 N); ASTM D 4632.
3. Sewn Seam Strength: 142 lbf (630 N); ASTM D 4632.
4. Tear Strength: 56 lbf (250 N); ASTM D 4533.
5. Puncture Strength: 56 lbf (250 N); ASTM D 4833.

6. Apparent Opening Size: No. 40 (0.425-mm) sieve, maximum; ASTM D 4751.
7. Permittivity: 50 gpm per sqft per, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 247 lbf (1100 N); ASTM D 4632.
3. Sewn Seam Strength: 222 lbf (990 N); ASTM D 4632.
4. Tear Strength: 90 lbf (400 N); ASTM D 4533.
5. Puncture Strength: 90 lbf (400 N); ASTM D 4833.
6. Apparent Opening Size: No. 30 (0.6-mm) sieve, maximum; ASTM D 4751.
7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material: Self-compacting, flowable concrete material produced from the following:

1. Portland Cement: ASTM C 150, Type I.
2. Fly Ash: ASTM C 618, Class C or F.
3. Normal-Weight Aggregate: ASTM C 33, 3/8-inch (10-mm)] nominal maximum aggregate size.
4. Foaming Agent: ASTM C 869.
5. Water: ASTM C 94/C 94M.
6. Air-Entraining Admixture: ASTM C 260.

B. Produce low-density, controlled low-strength material with the following physical properties:

1. As-Cast Unit Weight: 30 to 36 lb/cu. ft. (480 to 576 kg/cu. m)) at point of placement, when tested according to ASTM C 138/C 138M.
2. Compressive Strength: 80 psi (550 kPa) 10 psi (965 kPa), when tested according to ASTM C 495.

2.4 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; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with

metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

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 earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

D. Protect subgrades and foundation soils from freezing temperatures and frost. Provide protective insulating materials as necessary.

E. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3. Limit trench excavations to area that will constructed by the end of the work day.

3.3 EXPLOSIVES

1. Explosives: Not used on this project.

3.4 EXCAVATION, GENERAL

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 to subgrade elevation.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:

    a. 24 inches (600 mm) outside of concrete forms other than at footings.
    b. 12 inches (300 mm) outside of concrete forms at footings.
    c. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.
    d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
    e. 6 inches (150 mm beneath bottom of concrete slabs-on-grade.
    f. 6 inches (150 mm) beneath pipe in trenches, and the greater of [24 inches (600 mm) wider than pipe or 42 inches (1065 mm) wide.

B. All excavation shall follow of the Contract Documents for the project.

C. All fill operations shall follow the benching recommendations and be tested by the project geotechnical engineer or his representative.

D. Once areas for lawns have been graded to subgrade, notify landscape architect for review prior to placement of topsoil. Areas receiving topsoil prior to review will not be accepted. ALL CONSTRUCTION STONE SHALL BE REMOVED< SUBGRADE FOR LAWN AREAS SHALL BE a minimum of 12” of SOIL.

3.5 EXCAVATION FOR STRUCTURES

A. Excavation shall comply with Labor, Occupation Safety and Health Administration (OSHA) regulations.

1. Do not excavate to full depth when there is a probability of frost forming, ground freezing or precipitation before the concrete is placed,
2. Keep all excavations dry by use of protection and dewatering.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots as directed by an arborist licensed in jurisdiction where Project is located retained by the contractor.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

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. For pipes and conduit less than 6 inches (150 mm) in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For pipes and conduit 6 inches (150 mm) or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
4. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trench Bottoms: Excavate trenches 6 inches (100 mm) deeper than bottom of pipe and conduit elevations to allow for bedding course. Hand-excavate deeper for bells of pipe.

1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

E. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots as directed by an arborist licensed in jurisdiction where Project is located retained by the contractor.

3.8 SUBGRADE INSPECTION

A. Notify Architect and Geotechnical Engineer when excavations have reached required subgrade.

B. If Geotechnical Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material following on site geotechnical engineer recommendations when directed in writing from Architect.

C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 25 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Geotechnical engineer, and replace with compacted backfill or fill as directed by Architect.
3. Do not proof roll wet or saturated subgrades.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work and measured by the onsite testing agent.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.9 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, pipe, or conduit as directed by Architect.

2. No changes to contract will occur as a result of unauthorized excavation.

3.10 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.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

C. Place backfill following recommendations of the Report of Geotechnical Exploration and as shown on the drawings.

3.12 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. Trenches under Footings: 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 "Cast-in-Place Concrete."

D. Trenches under Roadways: Provide 6-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 course. Concrete is specified in Division 3 Section "Cast-in-Place Concrete.

E. Backfill voids with satisfactory soil while removing shoring and bracing.

F. 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 pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

G. Controlled Low-Strength Material: Place initial backfill of controlled low-strength material to a height of 12 inches (300 mm) over the pipe or conduit.

H. Coordinate backfilling with utilities testing.

I. Place and compact final backfill of satisfactory soil to final subgrade elevation.

J. Controlled Low-Strength Material: Place final backfill of controlled low-strength material to final subgrade elevation.

K. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.13 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. Refer to report of geotechnical exploration**.**

C. 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.
5. Under footings and foundations, use engineered fill.
6. This does not relieve the contractor from meeting topsoil requirements. Refer to landscape specifications.

D. Place soil fill on subgrades free of mud, frost, snow, or ice.

E. Contractor shall remove ALL stone and filter fabric placed for construction access and scarify all sub-grades to a depth of 4" prior to placement of topsoil. Landscape architect shall review grades prior to placement of topsoil. Contractor shall place a minimum of 8" of topsoil on all areas outside of the buildings that are not paved or constructed with other improvements. Topsoil shall be free of stones and amended as necessary to meet definitions of topsoil prior to placement on site.

3.14 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 and is too wet to compact to specified dry unit weight, as directed by the onsite testing agent.

3.15 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

1. Under building, scarify and re-compact top 12 inches (150 mm). Compact subgrade and fill material as follows; compact all soil materials placed beneath floor slabs and above bottom of footing elevation to **98** percent. The moisture content shall be maintained between minus 2, plus 1 percent of optimal moisture.

2. Under, walkways, pavements and sportsfields scarify and re-compact top 6 inches (150 mm) of existing subgrade. Any soil fill placed within base of pavement section shall be compacted to **95** percent. The moisture content shall be maintained between minus 2, plus 1 percent of the optimal moisture

3. Under turf or unpaved areas, scarify and re-compact the top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material to 92 percent.

D. Refer to geotechnical report.

3.16 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.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 0.1 ft.
2. Sidewalks: Plus or minus 0.05 ft.
3. Pavements: Plus or minus 0.05 ft.
4. Synthetic Turf Plus or Minus 0.04ft. Laser grade to within ¼" of grades and slopes shown on drawings.
5.

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.

D. Contractor shall provide and place topsoil a minimum of 8" in thickness on the site to the finish grades as shown on the plans. All areas shall have positive drainage to the storm sewer system. All erosion control measures required to hold topsoil in place until lawn is established are part of the contractor responsibility.

3.17 SUBSURFACE DRAINAGE

A. All subsurface drainage shall be installed as specified, shown on the drawings and following recommendations of the report of geotechnical exploration.

B. Subdrainage Pipe: Shall be placed as Specified and as shown on the drawings

C. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch (150-mm) course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches (300 mm) of filter material, placed in compacted layers 6 inches (150 mm) thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm)

1. Compact each filter material layer to 95 percent of maximum dry unit weight according to ASTM D 698 with a minimum of two passes of a plate-type vibratory compactor.

D. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade, in compacted layers 6 inches (150 mm) thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches (150 mm).

1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698 with a minimum of two passes of a plate-type vibratory compactor.

2. Place and compact impervious fill over drainage backfill in 6-inch- (150-mm-) thick compacted layers to final subgrade.

3.18 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Install separation fabric on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends where indicated on construction drawings.

B. Under pavements and walks, place subbase course on separation fabric according to fabric manufacturer's written instructions.

C. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

D. On prepared subgrade, place subbase course under pavements and walks as follows:

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends where indicated on construction drawings.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase course to required crown elevations and cross-slope grades.
4. Place subbase course 6 inches (150 mm) or less in compacted thickness in a single layer.
5. Place subbase course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
6. Compact subbase 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 1557.

E. Pavement Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders, at least 12 inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.19 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install sub drainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends where indicated on construction drwg’s.
2. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
3. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 100 percent of maximum dry unit weight according to ASTM D 698.

3.20 FIELD QUALITY CONTROL

A. Special Inspections and Quality Assurance: The General Contractor will engage a qualified testing agency perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material and maximum lift thickness comply with requirements.
3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of controlled fill.
5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly.
6. Requirements of 2007 KBC chapter 17.

B. Testing Agency: The General Contractor will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. 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.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D698, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m)or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet (30 m) or less of wall length, but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet (46 m) or less of trench length, but no fewer than two tests.
4. All column footings interior and along exterior wall shall be individually tested for acceptance for bearing capacity using the dynamic cone penatration.
5. The foundation wall footings shall be tested using the dynamic cone penetration test at an interval of not less than 30’.

F. 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 materials to depth required; re-compact and retest until specified compaction is obtained.

3.21 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.

1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and re-compact.

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.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove from Owner’s property and dispose off-site surplus soils unless otherwise shown on plans to transport suitable spoils to designated storage areas on Owner’s property. Stockpile or spread soil as directed by Architect.
1. Soil stockpiles shall not exceed 6’ in height or have slopes greater than 4:1 without written approval of the architect.
2. Remove unsuitable soils, waste materials, including trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 312200 - GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of topsoil.

B. Rough grading the site for site structures, building pads, and paved areas (roads and parking).

C. Finish grading.

1.02 RELATED REQUIREMENTS

A. Section 311000 - Site Clearing.

B. Section 310000 - Earthwork

C. Section 312323 - Fill: Filling and compaction.

D. Section 312316.13 - Trenching: Trenching and backfilling for utilities.

F. Section 329219 - Seeding: Finish ground cover.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 012200 - Unit Prices, for general requirements relating to unit prices for this work.

1.04 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with State of Kentucky, Highway Department standards.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: See Section 312323.

B. Topsoil: See section 310000.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Locate, identify, and protect from damage above- and below-grade utilities to remain.

D. Notify utility company to remove and relocate utilities.

E. Protect site features to remain, including but not limited to bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.

F. Protect trees to remain by providing substantial fencing around entire tree at the outer tips of its branches; no grading is to be performed inside this line.

G. Protect plants, lawns, rock outcroppings, and other features to remain as a portion of final landscaping.

3.03 ROUGH GRADING

A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.

B. Do not remove topsoil when wet.

C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.

D. Do not remove wet subsoil, unless it is subsequently processed to obtain optimum moisture content.

E. When excavating through roots, perform work by hand and cut roots with sharp axe.

F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

3.04 SOIL REMOVAL

A. Stockpile topsoil to be re-used on site; remove remainder from site.

B. Stockpiles: Use areas designated on site; pile depth not to exceed 8 feet; protect from erosion.

3.05 FINISH GRADING

A. Before Finish Grading:
   1. Verify building and trench backfilling have been inspected.
   2. Verify subgrade has been contoured and compacted.

B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.

C. Where topsoil is to be placed, scarify surface to depth of 3 inches.

D. In areas where vehicles or equipment have compacted soil, scarify surface to depth of 3 inches.

E. Place topsoil in areas where seeding are indicated.

F. Place topsoil to the following compacted thicknesses:

G. Place topsoil during dry weather.

H. Remove roots, weeds, rocks, and foreign material while spreading.

I. Near plants spread topsoil manually to prevent damage.

J. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

K. Lightly compact placed topsoil.

3.06 TOLERANCES

A. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.

B. Top Surface of Finish Grade: Plus or minus 1/2 inch.

3.07 REPAIR AND RESTORATION

A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.

B. Trees to Remain: If damaged due to this work, trim broken branches and repair bark wounds; if root damage has occurred, obtain instructions from Architect as to remedy.

C. Other Existing Vegetation to Remain: If damaged due to this work, replace with vegetation of equivalent species and size.

3.08 FIELD QUALITY CONTROL

A. See Section 312323 for compaction density testing.

3.09 CLEANING

A. Remove unused stockpiled topsoil. Grade stockpile area to prevent standing water.

B. Leave site clean and raked, ready to receive landscaping.

END OF SECTION

SECTION 312316 - EXCAVATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Excavating for building volume below grade, footings, slabs-on-grade, paving, site structures, and utilities within the building.

B. Trenching for utilities outside the building to utility main connections.

1.02 RELATED REQUIREMENTS

A. Document Report of Geotechnical Investigation.

B. Section 312200 - Grading: Soil removal from surface of site.

C. Section 312200 - Grading: Grading.

D. Section 312323 - Fill: Fill materials, filling, and compacting.

E. Section 312316.13 - Trenching: Excavating for utility trenches outside the building to utility main connections.

F. Section 312316.26 - Rock Removal: Removal of rock during excavating.

G. Section 334600 - Subdrainage: Filter aggregate and filter fabric for foundation drainage systems.

H. Section 315001: Excavating Support and Protection.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 012200 - Unit Prices, for general requirements applicable to unit prices for excavation.

1.04 PROJECT CONDITIONS

A. Verify that survey bench mark and intended elevations for the Work are as indicated.

PART 3 EXECUTION

2.01 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 312200 for additional requirements.

C. Locate, identify, and protect utilities that remain and protect from damage.

D. Notify utility company to remove and relocate utilities.

E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

F. Protect plants, lawns, rock outcroppings, and other features to remain.

2.02 EXCAVATING

A. Excavate to accommodate new structures and construction operations.

B. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

C. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.

D. Do not interfere with 45 degree bearing splay of foundations.

E. Cut utility trenches wide enough to allow inspection of installed utilities.

F. Hand trim excavations. Remove loose matter.

G. Remove lumped subsoil, boulders, and rock up to 1/3 cu yd measured by volume. See Section 312316.26 for removal of larger material.

H. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 312323.

I. Grade top perimeter of excavation to prevent surface water from draining into excavation.

J. Remove excavated material that is unsuitable for re-use from site.

K. Remove excess excavated material from site.

2.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for field inspection and testing.

B. Provide for visual inspection of load-bearing excavated surfaces before placement of foundations.

2.04 PROTECTION

A. Prevent displacement of banks and keep loose soil from falling into excavation; maintain soil stability.

B. Protect bottom of excavations and soil adjacent to and beneath foundation from freezing.

END OF SECTION

SECTION 312316.13 - TRENCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Backfilling and compacting for utilities outside the building to utility main connections.

1.02 RELATED REQUIREMENTS

A. Document Report of Geotechnical Exploration.

B. Section 312200 - Grading: Site grading.

C. Section 310000 - Earthwork.

D. Section 312323 - Fill: Backfilling at building and foundations.

E. Section 334600 - Subdrainage: Filter aggregate and filter fabric for foundation drainage systems.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 012200 - Unit Prices, for general requirements applicable to unit prices for earthwork.

1.04 DEFINITIONS

A. Finish Grade Elevations: Indicated on drawings.

B. Subgrade Elevations: Indicated on drawings.

1.05 REFERENCES

A. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2001 (2004).

B. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.

C. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2007.

D. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2007.

E. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2007.

F. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2008.

G. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2006.

H. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2005.

I. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.

J. ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2005.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Compaction Density Test Reports.

1.07 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where designated.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill: Conforming to State of Kentucky Highway Department standard.

B. Structural Fill: Conforming to State of Kentucky Highway Department standard.

C. Concrete for Fill: As specified in Section 033000; compressive strength of 2500 psi.

D. Granular Fill: Coarse aggregate, conforming to State of Kentucky Highway Department standard.

E. Topsoil: See Section 312200.

2.02 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, woven.

2.03 SOURCE QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum locations.

B. See Section 312200 for additional requirements.

C. Locate, identify, and protect utilities that remain and protect from damage.

D. Notify utility company to remove and relocate utilities.

E. Protect bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

F. Protect plants, lawns, rock outcroppings, and other features to remain.

3.03 TRENCHING

A. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.

B. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.

C. Do not interfere with 45 degree bearing splay of foundations.

D. Cut trenches wide enough to allow inspection of installed utilities.

E. Hand trim excavations. Remove loose matter.

F. Remove large stones and other hard matter that could damage piping or impede consistent backfilling or compaction.

G. Remove excavated material that is unsuitable for re-use from site.

H. Stockpile excavated material to be re-used in area designated on site in accordance with Section 312200.

I. Remove excess excavated material from site.

3.04 PREPARATION FOR UTILITY PLACEMENT

A. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

B. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

C. Until ready to backfill, maintain excavations and prevent loose soil from falling into excavation.

3.05 BACKFILLING

A. Backfill to contours and elevations indicated using unfrozen materials.

B. Fill up to subgrade elevations unless otherwise indicated.

C. Employ a placement method that does not disturb or damage other work.

D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.

G. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.

H. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

I. Correct areas that are over-excavated.
   1. Thrust bearing surfaces: Fill with concrete.
   2. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

J. Compaction Density Unless Otherwise Specified or Indicated:
   1. Under paving, slabs-on-grade, and similar construction: 97 percent of maximum dry density.

K. Reshape and re-compact fills subjected to vehicular traffic.

3.06 BEDDING AND FILL AT SPECIFIC LOCATIONS

A. Use general fill unless otherwise specified or indicated.

B. Utility Piping, Conduits, and Duct Bank:
   1. Bedding: Use granular fill.
   2. Cover with general fill.
   3. Fill up to subgrade elevation.
   4. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.

C. At Pipe Culverts:
   1. Bedding: Use granular fill.
   2. Place filter fabric specified in Section 330513 over compacted bedding.
   3. Cover with granular fill, see trench details.
   4. Fill up to subgrade elevation.
   5. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.

D. Over Subdrainage Piping at Foundation Perimeter and Under Slabs:
   1. Drainage fill and geotextile fabric: Section 334600.
   2. Cover drainage fill with general fill.
   3. Fill up to subgrade elevation.
   4. Compact to 95 percent of maximum dry density.

E. At French Drains:
   1. Use granular fill.
   2. Fill up to 8 inches below finish grade.
   3. Compact to 95 percent of maximum dry density.

3.07 TOLERANCES

A. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1 inch from required elevations.

3.08 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for field inspection and testing.

B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.

C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.

D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Frequency of Tests: at each compated initial and final backfill layer, at least one test for each 150 linear feet or less of trench length, but no fewer than two tests.

3.09 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 312319 - DEWATERING (DURING CONSTRUCTION)

PART 1 -GENERAL

1.01 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the design and installation of a temporary de-watering system until completion of construction to remove surface and subsurface waters from structure or utility trench excavations and pavement and sidewalk excavations as required.

B. Related Sections: The following sections contain requirements that relate to this section:

1. Section: Earthwork

C. The Site Sub-Contractor shall be responsible for providing dewatering as associated with sitework and as required for the progress of the work.

D. The Sub-Contractor installing work in trenches shall be responsible for providing dewatering as associated with utility work in trenches as required for the progress of the work.

E. The Earthwork contractor shall be responsible for providing dewatering as associated with earthwork in pavement and sidewalk excavations as required for the progress of the work, unless indicated otherwise. **If the contractor allows soils to become saturated and therefore deemed unsuitable by the on site testing agent, any required remediation shall be the responsibility of the contractor, including any undercut/over-excavation required to achieve suitable bearing conditions. This shall be at no additional cost to the Owner.**

F. The Concrete foundation sub-contractor shall be responsible to provide dewatering as associated with footing excavations as required for the progress of the work.

1.3 SUBMITTALS

A. General: Submit to the Owner’s Representative for review, the proposed methods of construction, including de-watering, excavation, bedding, filling, compaction and back filling for the various portions of the Work. The Owner’s Representative's review shall be for method only. The Contractor shall remain responsible for the adequacy and safety of the methods.

B. Submittals shall include the following:

1. Design notes and drawings.
2. Descriptive literature of the temporary de-watering system.
3. Layout of all piping involved.

C. Binders: All submittal data shall be bound in three-ring binders and all sections shall be tabbed and properly indexed.

1.4 QUALITY ASSURANCE

A. Standards: The de-watering of any utility structure, utility trench or any other excavation and the disposal of water during construction shall be in accordance with all local and state government rules, regulations, and applicable permit conditions.

1.5 CRITERIA

A. The de-watering system shall be developed to the point that it is capable of de-watering the site surrounding all structures, pavement areas, utility structures, or utility trenches as shown on the Drawings. Each system shall be capable of de-watering and maintaining ground water levels to a minimum depth of 2 feet below the respective excavation.

1.6 PERMITS

A. General: Each Subcontractor shall be responsible for the preparation of, submission of, costs for, and any additional requirements necessary to obtain all permits required for de-watering.

PART 2 - PRODUCTS

2.1 GENERAL

A. Equipment: The equipment specified herein shall be standard de-watering equipment of proven ability as designed, manufactured, and installed by firms having experience in the design and production of such equipment. The equipment furnished shall be designed, constructed and installed in accordance with standard industry practices and methods.

PART 3 -EXECUTION

3.1 INSTALLATION

A. De-watering: The sub-contractors shall install a temporary de-watering systems for the removal of surface and subsurface water encountered during construction of the proposed structures, pavements or excavation of utility trenches.

3.2 PUMPING AND DRAINAGE

A. Maintenance: The sub-contractors shall at all times during construction provide and maintain proper equipment and facilities to remove all water entering the proposed excavations, and shall keep such excavations dry so as to obtain a satisfactory undisturbed sub-grade foundation condition until the fills, structures or pipes to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural levels. **If the contractor allows soils to become saturated and therefore deemed unsuitable by the on site testing agent, any required remediation shall be the responsibility of the contractor, including any undercut/over-excavation required to achieve suitable bearing conditions. This shall be at no additional cost to the Owner.**

B. Bearing: De-watering shall at all times be conducted in such a manner as to preserve the undisturbed bearing capacity of the sub-grade soils at the proposed bottom of the

excavation and to preserve the integrity of adjacent structures. At a minimum, the water level shall be two feet below the trench or excavation bottom. Well or pump installations shall be constructed with proper sand filters to prevent drawing of finer grained soil from the surrounding ground.

C. Rim Ditches: Water entering the excavation from surface runoff shall be collected in shallow ditches around the perimeter of the excavation, drained to sumps, and pumped from the excavation to maintain a bottom free from standing water.

D. Flotation: the sub-contractors shall prevent Flotation, by maintaining a positive and continuous operation of the de-watering system. The Contractor shall be fully responsible and liable for all damages, which may result from failure of this system.

E. Fuel Spills: The sub-contractors shall take all necessary precautions to preclude the accidental discharge of fuel, oil, etc. in order to prevent adverse effects on groundwater quality.

3.3 PROTECTION AND SITE CLEAN-UP

A. Immediately upon completion of the de-watering operations, the sub-contractor shall remove all of his equipment, materials, and supplies from the site of the work, remove all surplus material and debris, fill in all holes or excavations, and grade the site to elevations of the surface levels which existed before work started.

END OF SECTION 312319

SECTION 312323 - FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling, backfilling, and compacting for building volume below grade and paving.

B. Backfilling and compacting for utilities outside the building to utility main connections.

C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.

1.02 RELATED REQUIREMENTS

A. Document Report of Geotechnical Exploration.

B. Section 312200 - Grading: Site grading.

C. Section 312316 - Excavation: Removal and handling of soil to be re-used.

D. Section 312316.13 - Trenching: Excavating for utility trenches outside the building to utility main connections.

E. Section 312316.26 - Rock Removal: Removal of rock during excavating.

F. Section 334600 - Subdrainage: Filter aggregate and filter fabric for foundation drainage systems.

G. Section 321423 - Asphalt Unit Paving: Leveling bed placement under pavers.

H. Section 033000 - Cast-in-Place Concrete.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 012200 - Unit Prices, for general requirements applicable to unit prices for earthwork.

1.04 DEFINITIONS

A. Finish Grade Elevations: Indicated on drawings.

B. Subgrade Elevations: Indicated on drawings and details.

1.05 REFERENCE STANDARDS

A. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2001 (2004).

B. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.

C. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2007.

D. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2007.

E. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2007.

F. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2008.

G. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2006.

H. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by

Nuclear Methods (Shallow Depth); 2005.

I. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.

J. ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2005.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

C. Compaction Density Test Reports.

1.07 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

B. When fill materials need to be stored on site, locate stockpiles where indicated.
   1. Separate differing materials with dividers or stockpile separately to prevent intermixing.
   2. Prevent contamination.
   3. Protect stockpiles from erosion and deterioration of materials.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. General Fill: Subsoil excavated on-site.
   1. Graded.
   2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   3. Conforming to ASTM D 2487 Group Symbol CL.

B. Structural Fill: Subsoil excavated on-site.
   1. Graded.
   2. Free of lumps larger than 3 inches, rocks larger than 2 inches, and debris.
   3. Conforming to ASTM D 2487 Group Symbol CL.

C. Concrete for Fill: Lean concrete.

D. Granular Fill: Coarse aggregate, conforming to State of Kentucky Highway Department standard.

E. Sand: Conforming to State of Kentucky Highway Department standard.

F. Topsoil:

- ❑ Topsoil: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify with local extension agent, suitability of native surface topsoil to produce viable planting soil. Modify and amend topsoil as required to achieve viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
- ❑ Supplement with off-site topsoil when on-site quantities are insufficient.
- ❑ Topsoil: ASTM D 5268 topsoil, with pH range of 5.5 to 7, a minimum of 2 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth. Use a Harley Rake/Rock Hound or similar to screen and clean the topsoil to meet requirements described herein.

2.02 ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, woven.

B. Vapor Retarder: 10 mil thick, polyethylene.

2.03 SOURCE QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. If tests indicate materials do not meet specified requirements, change material and retest.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the Work are as indicated.

B. Identify required lines, levels, contours, and datum locations.

C. See Section 312200 for additional requirements.

D. Verify subdrainage, dampproofing, or waterproofing installation has been inspected.

E. Verify structural ability of unsupported walls to support imposed loads by the fill.

3.02 PREPARATION

A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with granual material as recommended by onsite geotechnical engineer.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. All Fill operations shall comply with the Geotechnical Engineers Recommendations.

C. Employ a placement method that does not disturb or damage other work.

D. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Granular Fill: Place and compact materials in equal continuous layers not exceeding 6 inches compacted depth.

G. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.

H. Slope grade away from building minimum 2 inches in 10 ft, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

I. Correct areas that are over-excavated.
   1. Load-bearing foundation surfaces: Use structural fill, flush to required elevation, compacted to 100 percent of maximum dry density.
   2. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

J. Compaction Density Unless Otherwise Specified or Indicated:
   1. Under paving, slabs-on-grade, and similar construction: 97 percent of maximum dry density.

2. At other locations: 95 percent of maximum dry density.

K. Reshape and re-compact fills subjected to vehicular traffic.

3.04 FILL AT SPECIFIC LOCATIONS

A. Use general fill unless otherwise specified or indicated.

B. Structural Fill:
1. Use structural fill.
2. Fill up to subgrade elevations.
3. Maximum depth per lift: 6 inches, compacted.
4. Compact to minimum 97 percent of maximum dry density.

C. Under Interior Slabs-On-Grade:
1. Use granular fill.
2. Compact to 95 percent of maximum dry density.
3. Cover with Fill Type granular.
a. Depth: 2 inches.
b. Compact to 95 percent of maximum dry density.

D. At Foundation Walls and Footings:
1. Do not backfill against unsupported foundation walls.

E. Over Subdrainage Piping at Foundation Perimeter and Under Slabs:
1. Drainage fill and geotextile fabric: Section 334600.
2. Cover drainage fill with Fill Type granular fill.
3. Fill up to subgrade elevation.
4. Compact to 95 percent of maximum dry density.

F. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches:
1. Bedding: Use granular fill.
2. Cover with general fill.
3. Fill up to subgrade elevation.
4. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.

G. At Interior Crawl Spaces:
1. Use general fill.
2. Depth: 6 inches.
3. Compact to 95 percent of maximum dry density.
4. Install vapor retarder over entire exposed surface.
5. Cover with granular fill, 2 inches deep.

H. Inside Planter Boxes:
1. Use granular fill, 4 inches deep.
2. Cover with geotextile fabric.
3. Cover with sand, 2 inches deep.
4. Finish with topsoil, to within 2 inches of planter rim, lightly tamped.

I. At Lawn Areas:
1. Use general fill.
2. Fill up to 6 inches below finish grade elevations.
3. Fill up to subgrade elevations.
4. Compact to 95 percent of maximum dry density.
5. See Section 312200 for topsoil placement.

J. At French Drains:
1. Use granular fill.
2. Fill up to 8 inches below finish grade.
3. Compact to 95 percent of maximum dry density.

K. Under Monolithic Paving and Monolithic Paver Setting Beds:
   1. Compact subsoil to 95 percent of its maximum dry density before placing fill.
   2. Use general fill.
   3. Fill up to 6 inches below finish paving elevation.
   4. Fill up to subgrade elevation.
   5. Compact to 95 percent of maximum dry density.
   6. See Section 321123 for aggregate base course placed over fill.

L. Pervious Pavment:
   1. Use granular fill.
   2. Fill _24___ inches deep.
   3. Fill up to _6___ inches below finish grade.
   4. Fill up to subgrade elevation.
   5. Maximum compacted depth of each lift: 6 inches.
   6. Place geotextile fabric between soil and granular fill.
   7. Compact to 95 percent of maximum dry density.

3.05 TOLERANCES

A. Top Surface of General Filling: Plus or minus 1 inch from required elevations.

B. Top Surface of Filling Under Paved Areas: Plus or minus 1 inch from required elevations.

3.06 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for field inspection and testing.

B. Perform compaction density testing on compacted fill in accordance with ASTM D1556, ASTM D2167, ASTM D2922, or ASTM D3017.

C. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor"), ASTM D 1557 ("modified Proctor"), or AASHTO T 180.

D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Frequency of Tests: Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D698, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
   1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m)or less of paved area or building slab, but in no case fewer than three tests.
   2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet (30 m) or less of wall length, but no fewer than two tests.
   3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet (46 m) or less of trench length, but no fewer than two tests.
   4. All column footings interior and along exterior wall shall be individually tested for acceptance for bearing capacity using the dynamic cone penatration.
   5. The foundation wall footings shall be tested using the dynamic cone penetration test at an interval of not less than 30'.

F. 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 materials to depth required; re-compact and retest until specified compaction is obtained.

G.

H. Proof roll compacted fill at surfaces that will be under slabs-on-grade, pavers, paving, and as recommended by Testing Agency.

3.07 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 312500- EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prevention of erosion due to construction activities.

B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.

C. Restoration of areas eroded due to insufficient preventive measures.

D. Performance bond.

E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

F. In general, the section includes all of the sediment and erosion control items needed to satisfy the regulatory authorities and may include, but not be limited to the following:

G. The Contractor Shall:
   1. Sign and obtain the Notice of Intent.
   2. Prepare and maintain a Best Management Practice Plan (BMP).
   3. Termination of the Notice of Intent.

1.02 RELATED SECTIONS

A. Section "Earthwork" for installation of the erosion and sediment control items.

1.03 RELATED DOCUMENTS

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

B. Related Documents: Documents affecting work of this section include but are not necessary limited to Kentucky Storm Water General Permit, Kentucky Erosion Prevention and Sediment Control Field Guide.

1.04 RELATED REQUIREMENTS

A. RELATED REQUIREMENTS
   1. Section 311000 - Site Clearing: Limits on clearing; disposition of vegetative clearing debris.
   2. Section 312200 - Grading: Temporary and permanent grade changes for erosion control.
   3. Section 313700 - Riprap: Temporary and permanent stabilization using riprap.
   4. Section 321123 - Aggregate Base Courses: Temporary and permanent roadways.
   5. Section 329219 - Seeding: Permanent turf for erosion control.
   6. Section 329223 - Sodding: Permanent turf for erosion control.
   7. Section 329300 - Plants: Permanent plantings for erosion control.

B. REFERENCE STANDARDS
   1. ASTM D 4355 - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc Type Apparatus; 2007.
   2. ASTM D 4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 1999a (Reapproved 2004).
   3. ASTM D 4533 - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2004.
   4. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2008.
   5. ASTM D 4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile; 2004.

6. ASTM D 4873 - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2002.
7. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; current edition.
8. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control; Federal Highway Administration; 1995.
9. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 1986.

1.05 PERFORMANCE REQUIREMENTS

A. Comply with all requirements of U.S. Environmental Protection Agency for erosion and sedimentation control, as specified for the National Pollutant Discharge Elimination System (NPDES), Phases I and II, under requirements for the 2003 Construction General Permit (CGP), whether the project is required by law to comply or not.

B. Also comply with all more stringent requirements of State of Kentucky Erosion and Sedimentation Control Manual.

C. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

D. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.

E. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.

F. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

G. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
   2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.

H. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
   1. Control movement of sediment and soil from temporary stockpiles of soil.
   2. Prevent development of ruts due to equipment and vehicular traffic.
   3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

I. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

J. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
   2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

K. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

L. Open Water: Prevent standing water that could become stagnant.

M. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.06 SUBMITTALS

A. NOI: Submit NOI to KPDES Branch, Division of Water, per attached instructions. A copy of the submitted NOI form shall be sent to the Architect and the Owner.

B. BMP: Submit BMP to appropriate regulatory agency. A copy shall be sent to the Architect and the Owner.

C. Subcontractor Signatures: Signatures of all subcontractors for approval stating that they have read, understand and that they intend to comply with the BMP. A copy of the signatures shall be submitted to the Architect and the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mulch: Use one of the following:
   1. Straw or hay.
   2. Wood waste, chips, or bark.
   3. Erosion control matting or netting.
   4. Cutback asphalt.
   5. Polyethylene film, where specifically indicated only.

B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.

C. Bales: Air dry, rectangular straw bales.
   1. Cross Section: 14 by 18 inches, minimum.
   2. Bindings: Wire or string, around long dimension.

D. Bale Stakes: One of the following, minimum 3 feet long:
   1. Steel U- or T-section, with minimum mass of 1.33 lb per linear foot.
   2. Wood, 2 by 2 inches in cross section.

E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
   1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with

ASTM D 4751.
2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D 4491.
3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D 4355 after 500 hours exposure.
4. Tensile Strength: 100 lb-f, minimum, in cross-machine direction; 124 lb-f, minimum, in machine direction; when tested in accordance with ASTM D 4632.
5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D 4632.
6. Tear Strength: 55 lb-f, minimum, when tested in accordance with ASTM D 4533.
7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
8. Manufacturers:

F. Silt Fence Posts: One of the following, minimum 5 feet long:

G. Gravel: See Section 321123 for aggregate.

H. **Erosion Control Blanket - Blanket shall not include any plastic netting; fabric shall be bound with jute or cotton.**

PART 3 EXECUTION

3.01 Continuous Service: The sediment and erosion control items are to be installed prior to the commencement of all other construction activities on site. Continuous maintenance shall be required until the next contract has been signed. To transfer the Notice of Intent, a letter is to be written and signed by the new contractor. Once this letter has been received and approved by the Division of Water the Contractor's responsibility shall be relieved.

3.02 Prepare Daily Field Reports per BMP requirements. A sample form is attached. Submit to regulatory agency as required.

3.03 Prepare Erosion and Sediment Control Inspection and Maintenance Report Form weekly per BMP requirements. A sample form is attached. Submit to regulatory agency as required.

3.04 Remove temporary erosion sediment control measures when site is 95% stabilized. Seed and protect any disturbed areas with permanent grass protect mixture.

3.05 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.06 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.07 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
1. Width: As required; 20 feet, minimum.
2. Length: 50 feet, minimum.
3. Provide at each construction entrance from public right-of-way.
4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.
1. Provide linear sediment barriers:
   a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
2. Space sediment barriers with the following maximum slope length upslope from barrier:
   a. Slope of Less Than 2 Percent: 100 feet..
   b. Slope Between 2 and 5 Percent: 75 feet.

c. Slope Between 5 and 10 Percent: 50 feet.
d. Slope Between 10 and 20 Percent: 25 feet.
e. Slope Over 20 Percent: 15 feet.

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Soil Stockpiles: Protect using one of the following measures:
1. Cover with polyethylene film, secured by placing soil on outer edges.
2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.

H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
2. Asphalt: Use only where no traffic, either vehicular or pedestrian, is anticipated.

I. Temporary Seeding: Use where temporary vegetated cover is required.

3.08 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
1. Excavate minimum of 6 inches.
2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
3. Place and compact at least 6 inches of 1.5 to 3.5 inch diameter stone.

B. Silt Fences:
1. Store and handle fabric in accordance with ASTM D 4873.
2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
5. Install with top of fabric at nominal height and embedment as specified.
6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
7. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

C. Straw Bale Rows:
1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
2. Install bales so that bindings are not in contact with the ground.
3. Embed bales at least 4 inches in the ground.
4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
5. Fill gaps between ends of bales with loose straw wedged tightly.

6. Place soil excavated for trench against bales on the upslope side of the row, compacted.

D. Temporary Seeding:
   1. When hydraulic seeder is used, seedbed preparation is not required.
   2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
   3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
   4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
   5. Incorporate fertilizer into soil before seeding.
   6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep deep.
   7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
   8. Repeat irrigation as required until grass is established.

3.09 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:
   1. Promptly replace fabric that deteriorates unless need for fence has passed.
   2. Remove silt deposits that exceed one-third of the height of the fence.
   3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Straw Bale Rows:
   1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
   2. Remove silt deposits that exceed one-half of the height of the bales.
   3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

E. Clean out temporary sediment control structures weekly and relocate soil on site.

F. Place sediment in appropriate locations on site; do not remove from site.

3.10 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

SECTION 313116 TERMITE CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Chemical soil treatment.

1.02 PRICE AND PAYMENT PROCEDURES

A. See Section 012200 - Unit Prices, for additional unit price requirements.

1.03 REFERENCE STANDARDS

A. Title 7, United States Code, 136 through 136y - Federal Insecticide, Fungicide and Rodenticide Act; United States Code; 1947 (Revised 2001).

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate toxicants to be used, composition by percentage, dilution schedule, intended application rate.

C. Test Reports: Indicate regulatory agency approval reports when required.

D. Manufacturer's Certificate: Certify that toxicants meet or exceed specified requirements.

E. Certificate of compliance from authority having jurisdiction indicating approval of toxicants.

F. Record moisture content of soil before application.

G. Warranty: Submit warranty and ensure that forms have been completed in Owner's name.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing this type of work and:
   1. Having minimum of 2 years documented experience.
   2. Approved by manufacturer of treatment materials.
   3. Licensed in Lexington, Kentucky.

1.06 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year installer's warranty against damage to building caused by termites.
   1. Include coverage for repairs to building and to contents damaged due to building damage. Repair damage and, if required, re-treat.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers:
   1. Bayer Environmental Science Corp: www.nobugs.com.
   2. FMC Professional Solutions: www.fmcprosolutions.com.
   3. Syngenta Professional Products: www.syngentaprofessionalproducts.com.
   4. Substitutions: See Section 016000 - Product Requirements.

B. Toxicant Chemical: EPA approved; synthetically color dyed to permit visual identification of treated soil.

C. Diluent: Recommended by toxicant manufacturer.

2.02 MIXES

A. Mix toxicant to manufacturer's instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that soil surfaces are unfrozen, sufficiently dry to absorb toxicant, and ready to receive treatment.

B. Verify final grading is complete.

3.02 APPLICATION

A. Comply with requirements of U.S. EPA and applicable state and local codes.

B. Spray apply toxicant in accordance with manufacturer's instructions.

C. Apply toxicant at following locations:
   1. Under Slabs-on-Grade.
   2. In Crawl Spaces.
   3. At Both Sides of Foundation Surface.
   4. Soil Within 10 feet of Building Perimeter For a Depth of 1 feet.

D. Under slabs, apply toxicant immediately prior to installation of vapor barrier.

E. At foundation walls, apply toxicant immediately prior to finish grading work outside foundations.

F. Apply extra treatment to structure penetration surfaces such as pipe or ducts, and soil penetrations such as grounding rods or posts.

G. Re-treat disturbed treated soil with same toxicant as original treatment.

H. If inspection or testing identifies the presence of termites, re-treat soil and re-test.

3.03 PROTECTION

A. Do not permit soil grading over treated work.

END OF SECTION

SECTION 321123 - AGGREGATE BASE COURSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.

B. Paving aggregates.

1.02 RELATED REQUIREMENTS

A. Section 312200 - Grading: Preparation of site for base course.

B. Section 312323 - Fill: Compacted fill under base course.

C. Section 312316.13 - Trenching: Compacted fill over utility trenches under base course.

D. Section 330513 - Manholes and Structures: Manholes including frames.

E. Section 321216 - Asphalt Paving: Binder and finish asphalt courses.

F. Section 321313 - Concrete Paving: Finish concrete surface course.

G. Section 321416 - Brick Unit Paving.

H. Section 321413 - Precast Concrete Unit Paving.

I. Section 321440 - Stone Paving.

J. Section 321423 - Asphalt Unit Paving.

K. Section 321713 - Parking Bumpers: Concrete bumpers.

L. Section 312323 - Fill: Topsoil fill at areas adjacent to aggregate base course.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 012200 - Unit Prices, for general requirements applicable to unit prices for earthwork.

B. Coarse Aggregate: By the cubic yard. Includes supplying aggregate material, stockpiling, scarifying substrate surface, placing, and compacting.

C. Fine Aggregate: By the cubic yard. Includes supplying aggregate material, stockpiling, scarifying substrate surface, placing where required, and compacting.

1.04 REFERENCE STANDARDS

A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses; American Association of State Highway and Transportation Officials; 1965 (2004).

B. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; 2001 (2004).

C. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.

D. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3)); 2007.

E. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2007.

F. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN m/m3)); 2007.

G. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 2008.

H. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2006.

I. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2005.

J. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth); 2005.

K. ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2005.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Materials Sources: Submit name of imported materials source.

C. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

D. Compaction Density Test Reports.

1.06 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

PART 2 PRODUCTS

2.01 MATERIALS

A. Coarse Aggregate: Coarse aggregate, conforming to State of Kentucky Highway Department standard.

B. Fine Aggregate: Sand; conforming to State of Kentucky Highway Department standard.

C. Geotextile Fabric: Non-biodegradable, woven.

2.02 SOURCE QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for testing and analysis of aggregate materials.

B. Where aggregate materials are specified using ASTM D 2487 classification, test and analyze samples for compliance before delivery to site.

C. If tests indicate materials do not meet specified requirements, change material and retest.

D. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that survey bench marks and intended elevations for the work are as indicated.

B. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.02 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.

B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION

A. Place aggregate in maximum 4 inch layers and roller compact to specified density.

B. Level and contour surfaces to elevations and gradients indicated.

C. Add small quantities of fine aggregate to coarse aggregate as appropriate to assist compaction.

D. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

E. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

B. Scheduled Compacted Thickness: Within 1/4 inch.

C. Variation From Design Elevation: Within 1/2 inch.

3.05 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for general requirements for field inspection and testing.

B. Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D1556.

C. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor").

D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

E. Proof roll compacted aggregate at surfaces that will be under slabs-on-grade.

3.06 CLEANING

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Kentucky Transportation Cabinet (KYTC) Standard Specifications for Road and Bridge Construction, latest edition, and Supplemental Specifications to the Standard Specifications.

1.2 SUMMARY

A. Section Includes:

1. Asphalt surface treatments.
2. Cold milling of existing asphalt pavement.
3. Hot-mix asphalt patching.
4. Hot-mix asphalt paving.
5. Hot-mix asphalt overlay.

1.3 DEFINITION

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.

B. Asphalt Pavement Sealer meeting ASTM D8099/D8099M-17 Standard Specification for Asphalt Emulsion Pavement Sealer.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
1. Job-Mix Designs: For each job mix proposed for the Work.

B. Qualification Data: For qualified manufacturer and Installer.

C. Material Test Reports: For each paving material.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by KYTC.

B. Installer Qualifications: Must have Certificate of Eligibility from the Kentucky Transportation Cabinet

C. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

D. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the Standard Specifications of the Kentucky Transportation Cabinet for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

E. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:

a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
b. Review condition of subgrade and preparatory work.
c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
d. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
2. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
3. Asphalt Base Course: Minimum surface temperature of 40 deg F (4.4 deg C) and rising at time of placement.
4. Asphalt Surface Course: Minimum surface temperature of 60 deg F (15.6 deg C) at time of placement.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, complying with KYTC Standard Specifications Section 805.

C. Fine Aggregate: ASTM D 1073, sharp-edged natural sand or sand prepared from stone, gravel or combinations thereof, complying with KYTC Standard Specifications Section 804.

1. For hot-mix asphalt, limit natural sand to a maximum of 10 percent by weight of the total aggregate mass.

D. Mineral Filler: ASTM D 242, rock or slag dust, hydraulic cement, or other inert material.

E. Recycled (Reclaimed) Asphalt Pavement (RAP): Milled or removed asphalt pavement may be utilized in accordance with KYTC Standard Specifications Section 409.

2.2 ASPHALT MATERIALS

A. Asphalt Binder: AASHTO MP 1a, PG 64-22. The Contractor may utilize PG 58-28 when asphalt mixture contains more than 15% RAP.

B. Prime Coat: ASTM D 2027, medium-curing cutback asphalt, MC-30 or MC-70.

C. Tack Coat: AASHTO M 140 emulsified asphalt, or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.

D. Water: Potable.

2.3 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

B. Sand: AASHTO M 29, Grade Nos. 2 or 3.

C. Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

2.4 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes meeting requirements of the Kentucky Transportation Cabinet (KYTC) or Asphalt Institute (AI) MS-2 and complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Base Course: KYTC mixture designation Class 1 Base or a Marshall mixture from AI MS-2. There shall be no restrictions on polish resistant aggregates (utilize KYTC Type “D” aggregates). Recycled Asphalt Pavement may be utilized in accordance with KYTC Standard Specifications Section 409.
3. Surface Course: KYTC mixture designation Class 1 Surface or a Marshall mixture from AI MS-2. The mixture gradation may pass through the restricted zone and there shall be no restriction on polish resistant aggregates (utilize KYTC Type “D” aggregates). Recycled Asphalt Pavement (RAP) may be utilized in accordance with KYTC Standard Specifications Section 409.

B. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes designed according to procedures established by the Kentucky Transportation Cabinet (KYTC) or Asphalt Institute (AI) MS-2 and complying with the following requirements.

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.

2. Provide mixes complying with composition, grading, and tolerance requirements in ASTM D 3515 for the following nominal, maximum aggregate sizes:

    a. Base Course: Mixture with a nominal maximum aggregate size of .75 inch (19 mm) with a minimum voids in the mineral aggregate (VMA) of 12 percent.
    b. Surface Course: Mixture with a nominal maximum aggregate size of 0.38 inch (9.5 mm) with a minimum VMA of 14 percent.

C. Asphalt Sealer: High Performance Mineral Reinforced Asphalt Emulsion by SealMaster Polymer Modified MasterSeal (PMM) or equal. Coal tar products are not allowed on this project.

POLYMER-MODIFIED MASTERSEAL (PMM) is an environmentally friendly mineral filled asphalt emulsion pavement sealer blended with polymers and special surfactants for superior adhesion, flexibility, and durability. Polymer-Modified MasterSeal is a higher solids, faster drying pavement sealer designed to protect and beautify asphalt pavement. Polymer-Modified MasterSeal is formulated to be job-mixed with aggregate. Polymer-Modified MasterSeal meets ASTM D8099/D8099M-17 Standard Specification for Asphalt Emulsion Pavement Sealer. PMM also meets FAA Item P-623 specification for Emulsified Asphalt Spray Sealcoat

Crack Filler: SealMaster Crackmaster Supreme or equal compatible with asphalt emulsion sealcoat.

Hot Mix Asphalt Patch: SealMaster PatchMaster or equal compatible with asphalt emulsion sealcoat.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to begin paving.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction**,** repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
2. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes).
3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

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

D. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.2 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
   1. Sweep loose granular particles from surface of unbound aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.

   1. Mix herbicide with prime coat if formulated by manufacturer for that purpose.

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m). Comply with provisions in KYTC Standard Specifications Section 406.

   1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
   2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.3 COLD MILLING

A. Clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement by cold milling to grades and cross sections indicated.

   1. Mill to a depth of **2 inches (50 mm)**.
   2. Mill to a uniform finished surface free of excessive gouges, grooves, and ridges.
   3. Control rate of milling to prevent tearing of existing asphalt course.
   4. Repair or replace curbs, driveway aprons, manholes, and other construction damaged during cold milling.
   5. Excavate and trim unbound-aggregate base course, if encountered, and keep material separate from milled hot-mix asphalt.
   6. Patch surface depressions deeper than 1 inch (25 mm) after milling, before wearing course is laid.
   7. Handle milled asphalt material according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."
   8. Keep milled pavement surface free of loose material and dust.
   9. Do not allow milled materials to accumulate on-site.

3.4 PATCHING

A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches (300 mm) into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.

   1. Undersealing: Pump hot undersealing asphalt under rocking slab until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.

2. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

C. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

D. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

E. Placing Patch Material: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

3.5 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch (25 mm) in existing pavements.

1. Install leveling wedges in compacted lifts not exceeding 3 inches (75 mm) thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of [**1/4 inch (6 mm)**].

1. Clean cracks and joints in existing hot-mix asphalt pavement.
2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.
3. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.

3.6 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted. Comply with applicable provisions of KYTC Standard Specifications Section 403 for delivery, placement, spreading and the compaction of the mixture.

1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at minimum temperature of 250 deg F (121 deg C).
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.

1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.7 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat to joints.
2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations."
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.8 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.9 INSTALLATION TOLERANCES

A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch (13 mm).
2. Surface Course: Plus 1/4 inch (6 mm), no minus.

B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch (6 mm).
2. Surface Course: 1/8 inch (3 mm).
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch (6 mm).

C. Design for a minimum fall of 1% to facilitate drainage (2% recommended).

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

C. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

D. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.

1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.

    a. One core sample will be taken for every 1000 sq. yd. (836 sq. m) or less of installed pavement, with no fewer than 3 cores taken.
    b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

E. Replace and compact hot-mix asphalt where core tests were taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.11 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

END OF SECTION 321216

SECTION 321313 - CEMENT CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. KYTC Specification Division 500 “PCC Pavement and Non-Structural Concrete Construction”

1.2 SUMMARY

A. This Section includes exterior cement concrete pavement for the following:

1. Service Areas.
2. Curbs and gutters.
3. Walkways.
4. Concrete Stairs and ramps.

B. Related Sections include the following:

1. Division 2 Section "Earthwork" for subgrade preparation, grading, and subbase course.
2. Division 2 Section "Pavement Joint Sealants" for joint sealants within concrete pavement and at isolation joints of concrete pavement with adjacent construction.
3. Division 3 Section "Cast-in-Place Concrete" for general building applications of concrete.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, expansive hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete pavement mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

C. Samples: 12”x12” sample panel to show exposed aggregate finish. (If exposed aggregate concrete is shown on plans)

D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:

1. Cementitious materials and aggregates.
2. Steel reinforcement and reinforcement accessories.
3. Admixtures.
4. Curing compounds.
5. Applied finish materials.

6. Bonding agent or adhesive.
7. Joint fillers.

F. Preinstallation conference and minutes of preinstallation conference.

G. Curing agent: Show compatability with silane sealer.

H. Silane Sealer: Show compatability with curing agent.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mix Concrete Association's Plant Certification Program.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

E. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by the requirements of the Contract Documents.

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixes.

G. Mockups: Cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Engineer.
2. Notify Engineer seven days in advance of dates and times when mockups will be constructed.
3. Obtain Engineer's approval of mockups before starting construction.
4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
5. Demolish and remove approved mockups from the site when directed by Engineer.
6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1. Before submitting design mixes, review concrete pavement mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with concrete pavement to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixes.
d. Concrete subcontractor.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

1. Use flexible or curved forms for curves of a radius 100 feet (30.5 m) or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.

C. Reinforcement Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

D. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60 (Grade 420), deformed bars; assembled with clips.

E. Plain Steel Wire: ASTM A 82, as drawn.

F. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60 (Grade 420). Cut bars true to length with ends square and free of burrs.

G. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

H. Hook Bolts: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

I. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

A. General: Use the same brand and type of cementitious material from the same manufacturer throughout the Project.

B. Portland Cement: ASTM C 150, Type I or II.

1. Fly Ash: ASTM C 618, Class F or C.
2. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

C. Aggregate: ASTM C 33, uniformly graded, from a single source, with coarse aggregate as follows:

1. Class: 4S.
2. Class: 4M.
3. Class: 1N.
4. Maximum Aggregate Size: 1 inch (25 mm) nominal.
5. Exposed aggregate: Gravel washed natural mineral aggregate, .5 inch minimum and 1 inch maximum size, natural reds and browns color range from a single source. Provide samples for color selection and approval by Owner. (If applicable to project)
5. Do not use fine or coarse aggregates containing substances that cause spalling.

I. Water: ASTM C 94.

2.4 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures.

B. Air-Entraining Admixture: ASTM C 260.

C. Water-Reducing Admixture: ASTM C 494, Type A.

2.5 FIBER REINFORCEMENT (Not Applicable)

2.6 CURING MATERIALS – ALL PRODUCTS SHALL BE FROM NEW SEALED CONTAINERS. CONTRACTOR SHALL NOTIFY ARCHITECT AFTER 28 DAY CURING PERIOD TO ARRANGE A PREINSTALLATION MEETING AND INSPECTION OF WALK FOR ACCEPTANCE PRIOR TO APPLICATION OF SILANE.

A. Absorptive Cover: Non Staining Burlene 10 oz. burlap combined with the moisture-retention and reflective features of 4 mil white opaque poly, extruded into burlap or equal (install and use per manufacturer's recommendations)
B. Moisture-Retaining Cover: Non Staining Burlene 10 oz. burlap combined with the moisture-retention and reflective features of 4 mil white opaque poly, extruded into burlap or equal (install and use per manufacturer's recommendations)

C. Water: Potable. BE CERTAIN NO WATER IS IN LINES FOR PUMPS OR SPRAYERS PRIOR TO APPLICATION OF SILANE.

D. Evaporation Retarder: Waterborne, NON-film/membrane forming, manufactured for application to fresh concrete.

E. Clear Non Residual Waterborne Curing Compound: Discoloration or mottling of concrete is not acceptable and will require removal and replacement of concrete at contractor's expense. Contractor shall utilize non-film, non-membrane forming cure that is compatible with the

penetrating silane sealer used on this project. Acceptable products are listed in this specification.

F. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

I. Products: Follow all manufacturer's installation guidelines and recommendations for pre and post preparation and clean up. Subject to compliance with requirements, provide one of the following:

1. Evaporation Retarder:

a. L&M E-Con

2. Clear Resin Non-Residual Non-Membrane-Forming Curing Compound:

a. L&M Cure (Cure R or Cure RZ are not acceptable)
b. Sonneborn – Sonosil
c. Chem-Rex Mastertop CST – (Jack Schwein-513-289-4867 cell)

3. Silane Water Repellant Penetrating Sealer:
No rain 24 hours before and 48 hours after application– contractor shall schedule accordingly. Apply 28 days after placement. Follow all manufacturer's installation guidelines and recommendations – apply at rate of 150SF / gallon unless otherwise indicated

a. EVONIK Protectosil CHEM-TRETE BSM 40 VOC - (Jack Schwein-513-289-4867 cell)
b. BASF Hydrozo Clear 40 VOC
c. Prosoco SL100

2.7 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.

C. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

D. Pavement-Marking Paint: Alkyd-resin type; ready mixed; complying with FS TT-P-115, Type I, or AASHTO M 248, Type N.

1. Color: Blue for handicapped requirements, yellow for fire lanes, white elsewhere.

E. Wheel Stops: Precast, air-entrained concrete; 2500-psi (17.2-MPa) minimum compressive strength; approximately 6 inches (150 mm) high, 9 inches (225 mm) wide, and 84 inches (2130 mm) long. Provide chamfered corners and drainage slots on underside, and provide holes for dowel-anchoring to substrate.

1. Dowels: Galvanized steel, diameter of 3/4 inch (19 mm), minimum length 10 inches (254 mm).

2.8 CONCRETE MIXES

A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the trial batch method.

1. Do not use Owner's field quality-control testing agency as the independent testing agency.

C. Proportion mixes to provide concrete with the following properties:

1. Compressive Strength (28 Days): 4500 psi.
2. Slump Limit: 3 to 4 inches.

D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements for concrete exposed to deicing chemicals.

G. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus or minus 1.5 percent:

1. Air Content: 6.0 percent for 1-inch (25-mm) maximum aggregate.

2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94.

B. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.

1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

C. Project-Site Mixing: Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixers of 1 cu. yd. (0.76 cu. m) or smaller capacity, continue mixing at least one and one-half minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixers of capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. 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.

PART 3 - EXECUTION

3.1 PREPARATION

A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Proceed with pavement only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

B. Remove loose material from compacted subbase surface immediately before placing concrete.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "Placing Reinforcing Bars" for placing and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch (50-mm) overlap to adjacent mats.

3.4 JOINTS

A. General: Construct construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at isolation joints.

1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
2. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
3. Provide tie bars at sides of pavement strips where indicated.
4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 50 feet (15.25 m), unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.

3. Terminate joint filler less than 1/2 inch (12 mm) or more than 1 inch (25 mm) below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

E. Contraction Joints: 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:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to the following radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.

a. Radius: 1/4 inch (6 mm).

2. 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 developing random contraction cracks.

F. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to the following radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

1. Radius: 1/4 inch (6 mm).

3.5 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.

D. Comply with requirements and with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery, at Project site, or during placement.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.

H. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.

1. Remove and replace portions of bottom layer of concrete that have been placed more than 15 minutes without being covered by top layer, or use bonding agent if approved by Engineer.

I. Screed pavement surfaces with a straightedge and strike off. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading dry-shake surface treatments.

J. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and replace with formed concrete.

K. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.

L. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

M. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

N. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F (32 deg C). Chilled mixing water or chopped ice may be used to control

temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, reinforcement steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.6 CONCRETE FINISHING

A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch (1.6 to 3 mm) deep with a stiff-bristled broom, perpendicular to line of traffic.

3.7 SPECIAL FINISHES

A. Exposed Aggregate (submit samples for color approval by Owner) (if shown on plans)

1. Decorative aggregate shall be integral to concrete mix, <u>not</u> seeded on top of concrete.

2. Wash concrete surfaces to which surface retarder has been applied with clean water and scrub with stiff bristle brush exposing decorative aggregate to match sample panel.

3. Provide penetrating silane selaer per manufcaturers recommendations and specifications.

3.8 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 cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) 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. Film or membrane forming retarders are not acceptable.

C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive non-staining cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with non-staining moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
3. 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.

E. Provide penetrating silane selaer per manufcaturers recommendations and specificaitons.

3.9 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch (6 mm).
2. Thickness: Plus 3/8 inch (9 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/4 inch (6 mm).
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch (25 mm).
5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch (6 mm).
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch (13 mm).
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches (6 mm per 300 mm).
8. Joint Spacing: 3 inches (75 mm).
9. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
10. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.10 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Owner.

B. Allow concrete pavement to cure for 28 days and be dry before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils (0.4 mm).

1. Broadcast glass spheres uniformly into wet pavement markings at a rate of 6 lb/gal. (0.72 kg/L).

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.

C. Testing Services: Testing shall be performed according to the following requirements:

1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C 172, except modified for slump to comply with ASTM C 94.
2. Slump: ASTM C 143; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
3. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air-entrained concrete.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.
5. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
6. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m). One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required.
7. When frequency of testing will provide fewer than five compressive-strength tests for a given class of concrete, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
8. When total quantity of a given class of concrete is less than 50 cu. yd. (38 cu. m), Engineer may waive compressive-strength testing if adequate evidence of satisfactory strength is provided.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, current operations shall be evaluated and corrective procedures shall be provided for protecting and curing in-place concrete.
10. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive compressive-strength test results equal or exceed specified compressive strength and no individual compressive-strength test result falls below specified compressive strength by more than 500 psi (3.4 MPa).

D. Test results shall be reported in writing to Engineer, Owner, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in pavement, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as the sole basis for approval or rejection.

F. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Engineer. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

3.13 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.

B. Drill test cores where directed by Engineer when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

E. Do not use salt as de-icing or snow removal agent during first year after installation. Only use sand or other non-damaging de-icing agent as approved by Owner during the first year of use.

END OF SECTION 321313

SECTION 321373 – CONCRETE JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. KYTC Specification Section 807.04 “Joint Fillers”

1.2 SUMMARY

A. This Section includes the following:

1. Expansion and contraction joints within portland cement concrete pavement.
2. Joints between portland cement concrete and asphalt pavement.
3. Joints between portland cement concrete and building structure.

1.3 SUBMITTALS
None required

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F (4.4 deg C).
3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than that allowed by joint sealant manufacturer for application indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint sealant manufacturer based on testing and field experience.

2.2 COLD-APPLIED JOINT SEALANTS

A. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS.

B. Type SL Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.

C. Multicomponent Low-Modulus Sealant for Concrete and Asphalt: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, self-leveling sealant.

D. Available Products: Subject to compliance with requirements, cold-applied joint sealants that may be incorporated into the Work include, but are not limited to, the following:

E. Products: Subject to compliance with requirements, provide one of the following:

1. Type NS Silicone Sealant for Concrete:

    a. Roadsaver Silicone-SL; Crafco Inc.
    b. 888; Dow Corning.

2. Type SL Silicone Sealant for Concrete and Asphalt:

    a. 890-SL; Dow Corning.

3. Multicomponent Low-Modulus Sealant for Concrete and Asphalt:

    a. SOF-SEAL; W.R. Meadows, Inc.

2.3 HOT-APPLIED JOINT SEALANTS

A. Elastomeric Sealant for Concrete: Single-component formulation complying with ASTM D 3406.

B. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 3405.

C. Available Products: Subject to compliance with requirements, hot-applied joint sealants that may be incorporated into the Work include, but are not limited to, the following:

D. Products: Subject to compliance with requirements, provide one of the following:

1. Elastomeric Sealant for Concrete:

    a. Superseal 444/777; Crafco, Inc.
    b. POLY-JET 3406; W.R. Meadows, Inc.

2. Sealant for Concrete and Asphalt:

    a. ROADSAVER 221; Crafco Inc.
    b. Product #9005; Koch Materials Company.
    c. Product #9030; Koch Materials Company.
    d. SEALTIGHT HI-SPEC; W.R. Meadows, Inc.

2.4 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.

B. Round Backer Rod for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depths, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

2.5 PRIMERS

A. Primers: Product 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.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

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

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of backer materials.
2. Do not stretch, twist, puncture, or tear backer materials.
3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants by proven techniques to comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by joint sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 321373

SECTION 321713 – CONCRETE WHEEL STOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Precast concrete parking bumpers and anchorage.

1.02 PRICE AND PAYMENT PROCEDURES

A. See Section 012200 - Unit Prices, for additional unit price requirements.

1.03 REFERENCE STANDARDS

A. ASTM A 615/A 615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2007.

B. ASTM C 33 - Standard Specification for Concrete Aggregates; 2007.

C. ASTM C 150 - Standard Specification for Portland Cement; 2007.

D. ASTM C 260 - Standard Specification for Air-Entraining Admixtures for Concrete; 2006.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide unit configuration, dimensions.

PART 2 PRODUCTS

2.01 MATERIALS

A. Parking Bumpers: Precast concrete, conforming to the following:
   1. Profile: Manufacturer's standard.
   2. Cement: ASTM C 150, Portland Type I - Normal; white color.
   3. Concrete Materials: ASTM C 33 aggregate, water, and sand.
   4. Reinforcing Steel: ASTM A 615/A 615M, deformed steel bars; unfinished finish, strength and size commensurate with precast unit design.
   5. Air Entrainment Admixture: ASTM C 260.
   6. Concrete Mix: Minimum 5000 psi, 28 day strength, air entrained to 5 to 7 percent.
   7. Use rigid molds, constructed to maintain precast units uniform in shape, size and finish. Maintain consistent quality during manufacture.
   8. Embed reinforcing steel, and drill or sleeve for two dowels.
   9. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
   10. Minor patching in plant is acceptable, providing appearance of units is not impaired.

B. Dowels: Cut reinforcing steel, 1/2 inch diameter, 18 inch long, pointed tip.

C. Adhesive: Epoxy type.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install units without damage to shape or finish. Replace or repair damaged units.

B. Install units in alignment with adjacent work.

C. Fasten units in place with 2 dowels per unit.

END OF SECTION

SECTION 321723 - PAINTED PAVEMENT MARKINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Parking lot markings, including parking bays, crosswalks, arrows, handicapped symbols, and curb markings.

B. Roadway lane markings and crosswalk markings.

C. "No Parking" curb painting.

D. Thermoplastic shall be used at intersection markings (Stop Bars, Crosswalks, Turn Arrows, Bike Lane Markings, etc) and as specified in the Contract Documents.

1.02 RELATED REQUIREMENTS

A. Section 321216 - Asphalt Paving.

B. Section 321313 - Concrete Paving.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 012100 - Allowances, for cash allowances affecting this section.

1.04 REFERENCE STANDARDS

A. FS TT-B-1325 - Beads (Glass Spheres); Retro-Reflective; Rev. D, 2007.

B. FS TT-P-1952 - Paint, Traffic Black, and Airfield Marking, Waterborne; Rev. E, 2007.

C. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.

D. FHWA MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; http://mutcd.fhwa.dot.gov; current edition.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Certificates: Submit for each batch of paint and glass beads stating compliance with specified requirements.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Paint: 2 containers, 1 gallon size, of each type and color.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver paint in containers of at least 5 gallons accompanied by batch certificate.

B. Deliver glass beads in containers suitable for handling and strong enough to prevent loss during shipment accompanied by batch certificate.

C. Store products in manufacturer's unopened packaging until ready for installation.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MATERIALS

A. Line and Zone Marking Paint: MPI No. 97 Latex Traffic Marking Paint; color(s) as indicated.
   1. Roadway Markings: As required by authorities having jurisdiction.
   2. Parking Lots: White.
   3. Handicapped Symbols: Blue.

B. Line and Zone Marking Paint: Refer to Section 099000.

C. Paint For Obliterating Existing Markings: FS TT-P-1952; black for bituminous pavements, gray for portland cement pavements.

D. Reflective Glass Beads: FS TT-B-1325, Type I (low index of refraction), Gradation A (coarse, drop-on); with silicone or other suitable waterproofing coating to ensure free flow.

E. Temporary Marking Tape: Preformed, reflective, pressure sensitive adhesive tape in color(s) required; Contractor is responsible for selection of material of sufficient durability as to perform satisfactorily during period for which its use is required.

F. Dual Zone usage mark per plans.

G. School Athletic / Band markings per plans or per owner's direction.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Clean surfaces thoroughly prior to installation.
   1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.

D. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.

E. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.

F. Temporary Pavement Markings: When required or directed by Architect, apply temporary markings of the color(s), width(s) and length(s) as indicated or directed.
   1. After temporary marking has served its purpose, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method so that surface to which the marking was applied will not be damaged.
   2. At Contractor's option, temporary marking tape may used in lieu of temporary painted marking; remove unsatisfactory tape and replace with painted markings at no additional cost to Owner.

3.03 INSTALLATION

A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.

B. Do not apply paint if temperature of surface to be painted or the atmosphere is less than 50 degrees F or more than 95 degrees F.

C. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.

D. Comply with FHWA MUTCD manual (http://mutcd.fhwa.dot.gov) for details not shown.

E. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.

F. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.
   1. Apply paint in two coats for permanent applications. Apply one coat only for temporary striping applications.
   2. Wet Film Thickness: 0.015 inch, minimum.
   3. Length Tolerance: Plus or minus 3 inches.
   4. Width Tolerance: Plus or minus 1/8 inch.

G. Roadway Traffic Lanes: Use suitable mobile mechanical equipment that provides constant agitation of paint and travels at controlled speeds.
   1. Conduct operations in such a manner that necessary traffic can move without hindrance.
   2. Place warning signs at the beginning of the wet line, and at points well in advance of the marking equipment for alerting approaching traffic from both directions. Place small flags or other similarly effective small objects near freshly applied markings at frequent intervals to reduce crossing by traffic.
   3. If paint does not dry within expected time, discontinue paint operations until cause of slow drying is determined and corrected.
   4. Skip Markings: Synchronize one or more paint "guns" to automatically begin and cut off paint flow; make length of intervals as indicated.
   5. Use hand application by pneumatic spray for application of paint in areas where a mobile paint applicator cannot be used.
   6. Distribute glass beads uniformly on the paint lines within ten seconds without any waste, applied at rate of 6 pounds per gallon of paint; if the marking equipment does not have a glass bead dispenser, use a separate piece of equipment adjusted and synchronized with the paint applicator; remove and replace markings having faulty distribution of beads.

H. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
   1. Mark the International Handicapped Symbol at indicated parking spaces.
   2. Hand application by pneumatic spray is acceptable.

I. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.

3.04 DRYING, PROTECTION, AND REPLACEMENT

A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.

B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.

C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.

D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.

E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.

F. Replace removed markings at no additional cost to Owner.

END OF SECTION

SECTION 323113 - CHAIN-LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Galvanized steel chain-link fabric.
2. Zn-5-Al-MM alloy-coated, steel chain-link fabric.
3. PVC-coated, steel chain-link fabric.
4. Galvanized steel framework.
5. Polymer-coated steel framework.

B. Related Sections include the following:

1. “Earthwork” for filling and for grading work.

1.3 DEFINITIONS

A. CLFMI: Chain Link Fence Manufacturers Institute.

B. Zn-5-Al-MM Alloy: Zinc-5 percent aluminum-mischmetal alloy.

1.4 SUBMITTALS

A. Product Data: Material descriptions, construction details, dimensions of individual components and profiles, and finishes for the following:

1. Fence and gate posts, rails, and fittings.
2. Chain-link fabric, reinforcements, and attachments.
3. Gates and hardware.

B. Shop Drawings: Show locations of fence, each gate, posts, rails, and tension wires and details of extended posts, extension arms, gate swing, or other operation, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, elevations, sections, gate swing and other required installation and operational clearances, and details of post anchorage and attachment and bracing.

C. Samples for Initial Selection: Manufacturer's color charts or 6-inch (150-mm) lengths of actual units showing the full range of colors available for components with factory-applied color finishes.

D. Product Certificates: Signed by manufacturers of chain-link fences and gates certifying that products furnished comply with requirements.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

F. Field Test Reports: Indicate and interpret test results for compliance of chain-link fence and gate grounding and bonding with performance requirements.

G. Maintenance Data: For the following to include in maintenance manuals specified in Division 1:

1. Polymer finishes.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed chain-link fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction.

1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies, to supervise on-site testing specified in Part 3.

C. Source Limitations for Chain-Link Fences and Gates: Obtain each color, grade, finish, type, and variety of component for chain-link fences and gates from one source with resources to provide chain-link fences and gates of consistent quality in appearance and physical properties.

1.6 PROJECT CONDITIONS

A. 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.

B. Field Measurements: Verify layout information for chain-link fences, poles and netting and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

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
   1. Master Halco
   2. Ameristar
   3. Sportsfield Specialties

2.2 CHAIN-LINK FENCE FABRIC

A. Steel Chain-Link Fence Fabric: Height indicated on Drawings. Provide fabric fabricated in one-piece widths for fencing in height of 12 feet (3.6 m) and less. Comply with CLFMI's "Product Manual" and with requirements indicated below:

   1. Mesh and Wire Size: 2” mesh, (9 ga core, 6 ga finish) PVC-coated wire unless indicated otherwise on Drawings (use 1-3/4” mesh, 9 ga core, 6 ga finish for tennis court fencing).
   2. Zinc-Coated Fabric: ASTM A 392, with zinc coating applied to steel wire before weaving according to ASTM A 817, Type II, zinc coated (galvanized) with the following minimum coating weight:

      a. Class 1: Not less than 1.2 oz./sq. ft. (366 g/sq. m) of uncoated wire surface.
   3. Zn-5-Al-MM Alloy-Coated Fabric: ASTM F 1345, with metallic coating Type III, Zn-5-Al-MM alloy coated, applied to steel wire according to ASTM A 817 with the following minimum coating weight:

      a. Class 1: Not less than 0.60 oz./sq. ft. (183 g/sq. m) of uncoated wire surface.

   4. PVC-Coated Fabric: ASTM F 668, Class [1] over metallic-coated steel wire.

      a. Metallic Coating: Zinc, Zn-5-Al-MM alloy.
      b. Color: Black complying with ASTM F 934.

   5. Coat selvage ends of fabric that is metallic coated during the weaving process with manufacturer's standard clear protective coating.

B. Selvage: Knuckled at both selvages.

2.3 INDUSTRIAL FENCE FRAMING

A. Round Steel Pipe: Standard weight, Schedule 40, galvanized steel pipe complying with ASTM F 1083. Comply with ASTM F 1043, Material Design Group IA, external and internal coating Type A, consisting of not less than 1.8-oz./sq. ft. (0.55-kg/sq. m) zinc; and the following strength and stiffness requirements:

Line, End, Corner, and Pull Posts and Top Rail: Per requirements for Light Industrial Fence.
- Gate Posts shall be: 4” diameter SS40 for 10’ tall fence, 3” diameter SS40 for 8’ tall fence and 2-1/2” diameter SS40 for 5’ tall fence. Use 4” diameter SS40 for 8’ tall double swing gates.
- Corner posts shall be 4” diameter SS40 for 10’ tall fence and 3” diameter SS40 for 5’ and 8’ tall fence
- Line Posts shall be 3” diameter SS40 for 10’ tall fence, 2-1/2” diameter for 5’ and 8’ tall fence (8’ max. spacing)
- All gate Framing shall be 2” diameter SS40
- All horizontal rails shall be 1-5/8” diameter SS40 (top rails shall be SS20)

B. Round Steel Pipe: Cold-formed, electric-resistance-welded steel pipe. Comply with ASTM F 1043, Material Design Group IC, with minimum yield strength of 50,000 psi (344 MPa); and the following external and internal coatings and strength and stiffness requirements:

1. Coatings: Type B, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film.
2. Coatings: External, Type B, zinc with organic overcoat, consisting of a minimum of 0.9 oz./sq. ft. (0.27 kg/sq. m) of zinc after welding, a chromate conversion coating, and a clear, verifiable polymer film. Internal, Type D, consisting of 81 percent, not less than 0.3-mil- (0.0076-mm-) thick, zinc pigmented coating.
3. Coatings: Type C, Zn-5-Al-MM alloy, consisting of not less than 1.8-oz./sq. ft. (0.55-kg/sq. m) coating.
4. Coatings: PVC black or galvanized as indicated on drawings.

C. Post Brace Rails: Match top rail for coating and strength and stiffness requirements. Provide brace rail with truss rod assembly for each gate, end, and pull post. Provide two brace rails extending in opposing directions, each with truss rod assembly, for each corner post and for pull posts. Provide rail ends and clamps for attaching rails to posts.

D. Top Rails: Fabricate top rail from lengths 21 feet (6.4 m) or longer, with swedged-end or fabricated for expansion-type coupling, forming a continuous rail along top of chain-link fabric.

E. Intermediate Rails: Match top rail for coating and strength and stiffness requirements.

F. Bottom Rails: Match top rail for coating and strength and stiffness requirements.

G. Extended Members: Extend posts above top of chain-link fabric as indicated on Drawings or as required to attach assemblies.

2.4 TENSION WIRE

A. General: Provide horizontal tension wire at the following locations:
1. As indicated on Drawings.

B. Metallic-Coated Steel Wire: 0.177-inch- (4.5-mm-) diameter, marcelled tension wire complying with ASTM A 824 and the following:

1. Coating: Type I, aluminum coated (aluminized).
2. Coating: Type II, zinc coated (galvanized) by the hot-dip process, with the following minimum coating weight:
   a. Matching chain-link fabric coating weight.

3. Coating: Type III, Zn-5-Al-MM alloy with the following minimum coating weight:
   a. Matching chain-link fabric coating weight.

2.5 INDUSTRIAL SWING GATES

A. General: Comply with ASTM F 900 for the following swing-gate types:

1. Single gate.
2. Double gate.

B. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F 1083 and ASTM F 1043 for materials and protective coatings.

C. Metal Pipe and Tubing: Aluminum. Comply with ASTM B 429 and ASTM F 1043 for materials and protective coatings.

D. Frames and Bracing: Fabricate members from round tubing with outside dimension and weight according to ASTM F 900 for the following gate fabric height:

1. Gate Fabric Height: 6 feet (1.83 m) or less.
2. Gate Fabric Height: More than 6 feet (1.83 m).

E. Frame Corner Construction: As follows:

1. Welded.
2. Assembled with corner fittings [and 5/16-inch- (7.9-mm-) diameter, adjustable truss rods for panels 5 feet (1.52 m) wide or wider].
3. Welded or assembled with corner fittings [and 5/16-inch- (7.9-mm-) diameter, adjustable truss rods for panels 5 feet (1.52 m) wide or wider].

F. Gate Posts: Fabricate members from round aluminum pipe with outside dimension and weight according to ASTM F 900 for the following gate fabric heights and leaf widths:

1. Gate Fabric Height by Leaf Width: 6 feet (1.83 m) or less by 4 feet (1.22 m) or less.
2. Gate Fabric Height by Leaf Width: 6 feet (1.83 m) or less by over 4 feet (1.22 m) but not over 10 feet (3.05 m).
3. Gate Fabric Height by Leaf Width: 6 feet (1.83 m) or less by over 10 feet (3.05 m) but not over 18 feet (5.49 m).
4. Gate Fabric Height by Leaf Width: Over 6 feet (1.83 m) by 6 feet (1.83 m) or less.
5. Gate Fabric Height by Leaf Width: Over 6 feet (1.83 m) by over 6 feet (1.83 m) but not over 12 feet (3.66 m).

G. Extended Gate Posts and Frame Members: Extend gate posts and frame end members above top of chain-link fabric at both ends of gate frame as indicated on Drawings or as required to attach assemblies.

H. Hardware: Latches permitting operation from both sides of gate, hinges, center gate stops and, for each gate leaf more than 5 feet (1.5 m) wide, keepers. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.

2.6 FITTINGS

A. General: Provide fittings for a complete fence installation, including special fittings for corners. Comply with ASTM F 626.

B. Post and Line Caps: Hot-dip galvanized pressed steel or hot-dip galvanized cast iron. Provide weathertight closure cap for each post. Prime and paint to match fence fabric.

1. Provide line post caps with loop to receive tension wire or top rail.

C. Rail and Brace Ends: Hot-dip galvanized pressed steel or hot-dip galvanized cast iron. Provide rail ends or other means for attaching rails securely to each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: Hot-dip galvanized pressed steel or round steel tubing. Not less than 6 inches (153 mm) long.
2. Rail Clamps: Hot-dip galvanized pressed steel. Provide line and corner boulevard clamps for connecting intermediate and/or bottom rails in the fence line to line posts.

E. Tension and Brace Bands: Hot-dip galvanized pressed steel.

2.7 CAST-IN-PLACE CONCRETE

A. General: Comply with ACI 301 for cast-in-place concrete.

B. Materials: Portland cement complying with ASTM C 150, aggregates complying with ASTM C 33, and potable water Measure, batch, and mix Project-site-mixed concrete according to ASTM C 94.

1. Concrete Mixes: Normal-weight concrete air entrained with not less than 3000-psi (20.7-MPa) compressive strength (28 days), 3-inch (75-mm) slump, and 1-inch (25-mm) maximum size aggregate.

C. Materials: Dry-packaged concrete mix complying with ASTM C 387 for normal-weight concrete mixed with potable water according to manufacturer's written instructions.

2.8 GROUT AND ANCHORING CEMENT

A. Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

2.9 POLYMER FINISHES (when indicated on plans)

A. Supplemental Color Coating: In addition to specified metallic coatings for steel, provide fence components with polymer coating.

B. Metallic-Coated Steel Tension Wire: PVC-coated wire complying with ASTM F 1664, Class 2b.

C. Metallic-Coated Steel Framing: Comply with ASTM F 1043 for polymer coating applied to exterior surfaces and, except for tubular shapes, to exposed interior surfaces.

1. Polymer Coating: Not less than 10-mil- (0.254-mm-) thick PVC or 3-mil- (0.076-mm-) thick polyester finish.

D. Fittings, Post and Line Caps, Rail and Brace Ends, Top Rail Sleeves, Tension and Brace Bands, Tension Bars, Truss Rod Assemblies, Tie Wires, Clips, and Fasteners: Comply with ASTM F 626 for polymer coating applied to exterior surfaces and, except inside cap shapes, to exposed interior surfaces.

1. Polymer Coating: Not less than 10-mil- (0.254-mm-) thick PVC.

E. Color: Color selection by owner (unless noted on plans) complying with ASTM F 934.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.

1. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.

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

3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet (152.5 m) or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION, GENERAL

A. General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

1. Install fencing on established boundary lines inside property line or unless indicated otherwise on drawings.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.

C. Post Setting: Hand-excavate holes for post foundations in firm, undisturbed or compacted soil. Set terminal, line, gate posts in concrete footing. Protect portion of posts aboveground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Using mechanical devices to set line posts per ASTM F 567 is permitted. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured.

1. Dimensions and Profile: As indicated on Drawings.
2. Exposed Concrete Footings: Extend concrete 2 inches (50 mm) above grade, smooth, and shape to shed water.
3. Concealed Concrete Footings: Stop footings below grade as indicated on Drawings to allow covering with surface material.
4. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
5. Posts Set into Concrete in Voids: Form or core drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.

3.4 CHAIN-LINK FENCE INSTALLATION

Use of tension wires versus top and bottom rails varies on this project depending on fence application. Refer to drawings for which fence requires tension wire and which fence requires top and bottom rail.

A. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of as indicated on Drawings.

B. Line Posts: Space line posts uniformly at 8 feet (2.44 m) o.c.

C. Post Bracing Assemblies: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts. Locate horizontal braces at midheight of fabric on fences with top rail and at two-thirds fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

D. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- (3.05-mm-) diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches (609 mm) o.c. Install tension wire in locations indicated before stretching fabric.

1. Top Tension Wire: Install tension wire through post cap loops.
2. Bottom Tension Wire: Install tension wire within 6 inches (150 mm) of bottom of fabric and tie to each post with not less than same gage and type of wire.

E. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended by fencing manufacturer.

F. Intermediate Rails: Install in one piece at as indicated on Drawings, spanning between posts, using fittings, special offset fittings, and accessories.

G. Bottom Rails : Install, spanning between posts, using fittings and accessories. Refer to detail drawings for locations.

H. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches (50 mm) between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

I. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches (380 mm) o.c.

J. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts 12 inches (304 mm) o.c. and to braces 24 inches (609 mm) o.c.

K. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.

3.5 GATE INSTALLATION

A. General: Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.6 ADJUSTING

A. Gate: Adjust gate to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Lubricate hardware and other moving parts.

3.7 ACCESSORIES

A. Install post caps and other accessories to complete fence.

3.8.1 CLEANING

A. Clean up debris and unused material, and remove from site

END OF SECTION 323113

SECTION 329200 – LAWNS AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Lawns.

1.3 SUBMITTALS

Topsoil analysis. Refer to sportsfield specification section 312000 for sportsfield topsoil/sand mix and refer to specification 329300 for lawn and landscape planting topsoil requirements.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer with a minimum of three years experience, who has completed seeding and sod work similar in scope to this Project and with a record of successful landscape establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that landscaping is in progress.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.

B. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

C. Sod: Harvest, deliver, store, and handle sod according to the requirements of the American Sod Producers Association's (ASPA) "Specifications for Turfgrass Sod Materials and Transplanting/Installing."

1.6 PROJECT CONDITIONS

A. Utilities: Determine location of above grade and underground utilities and perform work in a manner which will avoid damage. Hand excavate, as required.

B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before planting.

1.7 COORDINATION AND SCHEDULING

A. Coordinate installation of planting materials during normal planting seasons (March 1st through October 1st), unless authorized in writing from the owner.

1.8 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Special Warranty: Warrant the following living planting materials for a period of one year after date of Lawn acceptance, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.

1. Lawns

1.9 LAWN MAINTENANCE

A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:

1. Seeded Lawns: 60 days after lawn is established and accepted.

a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.

b. When contractor feels the lawn areas are fully established there shall be a meeting on site for the owner to accept and the maintenance period shall start upon acceptance by owner.

2. Sodded Lawns: 60 days after date of Lawn Acceptance.

B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.

C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches. Temporary irrigation will not be in place for more than 12 months.

1. Water lawn to ensure that when combined with rainfall the lawn is getting a minimum of 1 inch of water per week.

D. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without

cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.

E. Postfertilization: Apply fertilizer to lawn after first mowing and when grass is dry.

1. Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq. ft. of lawn area.

PART 2 - PRODUCTS

2.1 GRASS MATERIALS

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.

1. Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated on Schedules at the end of this Section.

B. Sod: Certified turfgrass sod complying with ASPA specifications for machine-cut thickness, size, strength, moisture content, and mowed height, and free of weeds and undesirable native grasses. Provide viable sod of uniform density, color, and texture of the following turfgrass species, strongly rooted, and capable of vigorous growth and development when planted.

1. Species: Provide Turf type fescue sod of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed to provide good quality lawn.

2.2 FERTILIZER

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

B. Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

PART 3 - EXECUTION

3.1 EXAMINATION

A. The Contractor shall examine areas to receive lawns for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until

unsatisfactory conditions have been corrected. No installation of landscaping materials or topsoil shall be done while the soil is either frozen or water saturated.

3.2 PREPARATION

A. Lay out locations, outline areas, and secure Architect's acceptance before the start of grassing. Make minor adjustments as may be required by Architect.

3.3 LAWN PLANTING PREPARATION

A. Limit subgrade preparation to areas that will be planted in the immediate future.

B. Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1-inch in any dimension and sticks, roots, rubbish, and other extraneous materials.

C. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.

1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.
2. Allow for sod thickness in areas to be sodded.

D. Preparation of Unchanged Grades: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:

1. Remove and dispose of existing grass, vegetation, and turf. Do not turn over into soil being prepared for lawns.
2. Till surface soil to a depth of at least 6 inches. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
3. Clean surface soil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.

E. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1 inch in any dimension, and other objects that may interfere with planting or maintenance operations.

F. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.4 SEEDING NEW LAWNS

A. Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.

1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.

B. Sow seed at the following rates:

1. Seeding Rate: 5 to 8 lb per 1000 sq. ft..

C. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.

D. Protect seeded slopes exceeding 1:4 against erosion with erosion-control blankets installed and stapled according to manufacturer's recommendations.

E. Protect seeded slopes exceeding 1:6 against erosion with jute or coir-fiber erosion-control mesh installed and stapled according to manufacturer's recommendations.

F. Protect seeded areas with slopes less than 1:6 against erosion by spreading straw mulch after completion of seeding operations. Spread uniformly at a minimum rate of 2 tons per acre to form a continuous blanket 1-1/2 inches loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

1. Anchor straw mulch by crimping into topsoil by suitable mechanical equipment.

G. Protect seeded areas against hot, dry weather or drying winds by applying peat mulch within 24 hours after completion of seeding operations. Soak and scatter uniformly to a depth of 3/16 inch thick and roll to a smooth surface.

3.5 HYDROSEEDING NEW LAWNS

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.

1. Mix slurry with nonasphaltic tackifier.
2. Apply slurry uniformly to all areas to be seeded in a 1-step process. Apply mulch at the minimum rate of 1500 lb per acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.6 SODDING NEW LAWNS

A. Lay sod within 24 hours of stripping. Do not lay sod if dormant or if ground is frozen.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within 2 hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below the sod.

3.7 RECONDITIONING LAWNS

A. Recondition existing lawn areas damaged by Contractor's operations, including storage of materials or equipment and movement of vehicles. Also recondition lawn areas where settlement or washouts occur or where minor regrading is required.

1. Recondition other existing lawn areas.

B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.

C. Where substantial lawn remains, mow, dethatch, core aerate, and rake. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.

D. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of it off the Owner's property.

E. Till stripped, bare, and compacted areas thoroughly to a depth of 6 inches.

F. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Provide new planting soil as required to fill low spots and meet new finish grades.

G. Apply seed and protect with straw mulch as required for new lawns.

H. Apply sod as required for new lawns.

I. Water newly planted areas and keep moist until new grass is established.

3.8 INSTALLATION OF MISCELLANEOUS MATERIALS

A. Apply antidesiccant using power spray to provide an adequate film over trunks, branches, stems, twigs, and foliage.

1. When deciduous trees or shrubs are moved in full-leaf, spray with antidesiccant at nursery before moving and again 2 weeks after planting.

3.9 CLEANUP AND PROTECTION

A. During landscaping, keep pavements clean and work area in an orderly condition.

B. Protect landscaping from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

3.11 SEEDING SCHEDULE

A. **Lawn Area Seed Mix:** Seed shall be a blend of Turf Type Tall Fescue with perennial and annual rye:

Provide a minimum of two types of Turf Type Fescue from the following list with Falcon II, Houndog 5, Finelawn Petite, and Crossfire II or as recommended by local county extension agent.

SEED MIXTURES SCHEDULE

Proportion	Name	Min. Pct. Germ.	Min. Pct. Pure Sd.	Max. Pct. Weed Sd.
85 pct.	Turf Type Tall Fescue	85	85	0.50
5 pct.	Bluegrass	85	85	0.50
10 pct.	Annual Rye Grass	85	90	0.50

SATISFACTORY TURF

At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 95% over any 10 sq. ft. and bare spots not exceeding 2" by 2". Contractor will not be paid until acceptable turf is established.

Contractor shall notify Landscape Architect and Owner when maintenance period is complete and solid stand of grass is established. The purpose of this notification is to ensure that there is no lapse between contractor maintenance and date when owner accepts and takes over maintenance of lawn areas. Contractor shall provide notification and maintenance acceptance letter for approval and shall not stop maintenance operations until acceptance letter is signed by Owner

END OF SECTION 329200

SECTION 330513 - MANHOLES AND STRUCTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Monolithic concrete manholes with masonry transition to lid frame, covers, anchorage, and accessories.

B. Modular precast concrete manhole sections with tongue-and-groove joints with masonry transition to lid frame, covers, anchorage, and accessories.

C. Monolithic FRP manholes with transition to lid frame, covers, anchorage, and accessories.

D. Masonry manhole sections with masonry transition to lid frame, covers, anchorage, and accessories.

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete.

B. Section 042000 - Unit Masonry: Masonry units and mortar and grout.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 012200 - Unit Prices, for additional unit price requirements.

1.04 REFERENCE STANDARDS

A. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2005.

B. ASTM A 48/A 48M - Standard Specification for Gray Iron Castings; 2003 (Reapproved 2008).

C. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.

D. ASTM C 55 - Standard Specification for Concrete Brick; 2006.

E. ASTM C 478 - Standard Specification for Precast Reinforced Concrete Manhole Sections; 2009.

F. ASTM C 478M - Standard Specification for Precast Reinforced Concrete Manhole Sections [Metric]; 2009.

G. ASTM C 923 - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals; 2008.

H. ASTM C 923M - Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals [Metric]; 2008b.

I. ASTM C 1634 - Standard Specification for Concrete Facing Brick; 2006.

J. ASTM D 3753 - Standard Specification for Glass-Fiber-Reinforced Polyester Manholes and Wetwells; 2005.

K. IMIAWC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate manhole locations, elevations, piping sizes and elevations of penetrations.

C. Product Data: Provide manhole covers, component construction, Lettering requirements for Manhole Lids, features, configuration, and dimensions.

1.06 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530.1/ASCE 6/TMS 602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manhole Sections: Reinforced precast concrete in accordance with ASTM C 478 (ASTM C 478M), with resilient connectors complying with ASTM C 923 (ASTM C 923M).

B. Manhole Sections: ASTM D 3753, glass-fiber reinforced polyester with integral steps.

C. Concrete: As specified in Section 033000.

D. Mortar and Grout: As specified in Section 042000, Type S.

E. Concrete Reinforcement: As specified in Section 033000.

2.02 COMPONENTS

A. Lid and Frame: ASTM A 48/A 48M, Class 30B Cast iron construction, machined flat bearing surface, removable lockable lid, closed lid design; live load rating of meeting or exceeding H-20 loading; sealing gasket; lid molded with identifying name ;.

B. Manhole Steps: Formed galvanized steel rungs; 3/4 inch diameter. Formed integral with manhole sections.

2.03 CONFIGURATION

A. Shaft Construction: Concentric with concentric cone top section; lipped male/female joints; sleeved to receive pipe sections.

B. Shape: Cylindrical.

C. Clear Inside Dimensions: 48 inch minimum diameter.

D. Design Depth: As indicated.

E. Clear Lid Opening: 26 inches diameter.

F. Pipe Entry: Provide openings as indicated.

G. Steps: As required by local code and details of authorities having jurisdiction.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify items provided by other sections of Work are properly sized and located.

B. Verify that built-in items are in proper location, and ready for roughing into Work.

C. Verify excavation for manholes is correct.

3.02 PREPARATION

A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.03 MANHOLES

A. Place concrete base pad, trowel top surface level.

B. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.

C. Form and place manhole cylinder plumb and level, to correct dimensions and elevations. As work progresses, build in connections as necessary.

D. Cut and fit for pipe.

E. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour as required.

F. Set cover frames and covers level without tipping, to correct elevations.

G. Coordinate with other sections of work to provide correct size, shape, and location.

3.04 MASONRY WORK

A. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

B. Lay masonry units in running bond. Course one unit and one mortar joint to equal 8 inches.

C. Form concave mortar joints.

D. Lay masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

E. Install joint reinforcement 16 inches on center.

F. Place joint reinforcement in first and second horizontal joints above base pad and below lid frame opening.

3.05 SCHEDULES

A. Storm Sewer Manholes: Precast concrete sections, galvanized steel steps, 48 inch inside dimension, to depth indicated, with bolted lid.

B. Electric Service Manholes: Prefabricated FRP sections, integral molded steps, 60 inch inside dimension, to depth indicated.

END OF SECTION

SECTION 334111 - SITE STORM UTILITY DRAINAGE PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Storm drainage piping, fittings, and accessories.

B. Connection of drainage system to municipal sewers.

C. Catch basins, Plant area drains, Paved area drainage, Site surface drainage, Detention tank, and Detention basin.

1.02 RELATED REQUIREMENTS

A. Section 312316.13 - Trenching: Excavating, bedding, and backfilling.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 012200 - Unit Prices, for additional unit price requirements.

1.04 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.05 REFERENCE STANDARDS

A. American Society For Testing and Materials (ASTM)
1. A185 – Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
2. A615 – Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
3. A760 – Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains
4. A798 – Installation of Corrugated-Steel Pipe for Sewers and Other Applications
5. A929 – Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe
6. C76 – Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
7. C443 – Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
8. C478 – Precast Reinforced Concrete Manhole Sections
9. C913 – Precast Concrete Water and Wastewater Structures
10. C1479 – Installation of Reinforced Concrete Pipe
11. C990-01A – Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
12. D1056 – Flexible Cellular Materials-Sponge or Expanded Rubber
13. D2321 – Installation of Thermoplastic Pipe for Sewer/Gravity-Flow Applications
14. D3034 – Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
15. D3212 – Joints for Drain and Sewer Plastic Pipes Using Elastomeric Seals
16. F477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe
17. F794 – Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
18. F949 – Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings
19. F2418 – Polypropylene (PP) Corrugated Wall Stormwater Collection Chambers

B American Association of State Highway and Transportation Officials (AASHTO)
1. M36 – Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains
2. M198 – Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets
3. M252 – Corrugated Polyethylene Drainage Tubing
4. M274 – Aluminum-Coated (Type 2), for Corrugated Steel Pipe 5. M288 – Geotextile Specification for Highway Applications
6. M294 – Corrugated Polyethylene Pipe.

7. M36 – Metallic Coated Corrugated Steel Culverts and Underdrains
8. M43 – Sizes of Aggregate for Road and Bridge Construction
9. M190 – Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches
10. M199 – Standard Specification for Precast Reinforced Concrete Manhole Sections
11. AASHTO LRFD Bridge Design Specifications Sections 3 & 12

C American Water Works Association (AWWA)

1. C110 – Ductile-Iron and Gray-Iron Fittings, 3 in through 48 in (75 mm through 1200 mm), for Water and Other Liquids (revision of ANSI/AWWA C110/A21.10-93)
2. C111 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
3. C151 – Ductile-Iron Pipe, Centrifugally Cast, for Water

D American Concrete Institute (ACI)

1. 301 – Structural Concrete for Buildings, Specifications for
2. 318 –Building Code Requirements for Structural Plain Concrete

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents:
   1. Record location of pipe runs, connections, catch basins, cleanouts, and invert elevations.
   2. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable code for materials and installation of the Work of this section.

PART 2 PRODUCTS

2.01 SEWER PIPE MATERIALS

A. Cast Iron Soil Pipe: ASTM A 74, Extra Heavy grade, inside nominal diameter as shown on plans, hub and spigot end.

B. Cast Iron Pipe Joint Device: ASTM C 564, rubber gasket joint devices.

C. Concrete Pipe: Reinforced, ASTM C 76 (ASTM C 76M), Class III with Wall type A; mesh reinforcement; inside nominal diameter as shown on plans, bell and spigot end joints.

D. Reinforced Concrete Pipe Joint Device: ASTM C 443 (ASTM C 443M) rubber compression gasket joint.

E. High Density Polyethylene Pipe (HDPE) Smooth Interior
   1. Pipe and fittings shall conform to AASHTO M252 and M294; Rubber gaskets shall meet the requirements of ASTM F477 with joints conforming to AASHTO M294, watertight designations;

2.02 PIPE ACCESSORIES

A. Pipe Joints: Mechanical clamp ring type, stainless steel expanding and contracting sleeve, neoprene ribbed gasket for positive seal.

B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

C. Filter Fabric: Non-biodegradable, woven.

D. Trace Wire: Magnetic detectable conductor, clear plastic covering, imprinted with "Storm Sewer Service " in large letters.

2.03 CATCH BASIN, CLEANOUT, AND AREA DRAIN COMPONENTS

A. Lids and Drain Covers: Cast iron, hinged to cast iron frame. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
   1. Catch Basin:
      a. Lid Design: Per Details on plans.
   2. Cleanout:
      a. Lid Design: Per Details on plans.
   3. Area Drain:
      a. Lid Design: Per Details on plans.

B. Shaft Construction and Concentric Cone Top Section: Reinforced precast concrete pipe sections, lipped male/female dry joints, nominal shaft diameter of as required for construction.

2.04 BEDDING AND COVER MATERIALS

A. Bedding: As specified in Section 312316.13.

B. Cover: As specified in Section 312316.13.

PART 3 EXECUTION

3.01 TRENCHING

A. See Section 312316.13 for additional requirements.

B. Hand trim excavation for accurate placement of pipe to elevations indicated.

C. Backfill around sides and to top of pipe with cover fill, tamp in place and compact, then complete backfilling.

3.02 INSTALLATION - PIPE

A. Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on layout drawings.

B. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal watertight.
   1. Plastic Pipe: Also comply with ASTM D 2321.

C. Lay pipe to slope gradients noted on layout drawings; with maximum variation from true slope of 1/8 inch in 10 feet.

D. Connect to building storm drainage system, foundation drainage system, and utility/municipal sewer system.

E. Install continuous trace wire 6 inches above top of pipe; coordinate with Section 312316.13.

3.03 INSTALLATION - CATCH BASINS AND CLEANOUTS

A. Installation of precast catch basins preferred.

B. Form bottom of excavation clean and smooth to correct elevation.

C. Form and place cast-in-place concrete base pad, with provision for sanitary sewer pipe end sections.

D. Establish elevations and pipe inverts for inlets and outlets as indicated.

E. Mount lid and frame level in grout, secured to top cone section to elevation indicated.

3.04 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with Section 014000.

B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.
   1. Pressure Test: Test in accordance with authorities having jurisdiction.

2. Infiltration Test: Test in accordance with authorities having jurisdiction.
3. Deflection Test: Test in accordance with authorities having jurisdiction.

3.05 PROTECTION

A. Protect pipe and bedding cover from damage or displacement until backfilling operation is in progress.

END OF SECTION

SECTION 334600 - SUBDRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes subdrainage systems for the following:

1. Foundations.
2. Underslab areas.
3. Retaining walls.
4. Permeable pavement areas

1.3 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene.

B. HDPE: High-density polyethylene.

C. PE: Polyethylene.

D. PP: Polypropylene.

E. PS: Polystyrene.

F. PVC: Polyvinyl chloride.

1.4 SUBMITTALS

A. Product Data: For drainage conduit, drainage panels, and geotextile fabrics.

1. Perforated pipe.
2. Solid pipe.
3. Pipe with open joints.
4. Drainage conduits.
5. Drainage panels.
6. Geotextile fabrics.
7. Plastic Drainage Grids

1.5 COORDINATION

A. Drainage panel materials and installation shall be compatible with waterproofing of walls below grade.

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 manufacturers below:
   1. Hancor
   2. ADS
   3. Timewell
   4. Multi-Flow

2.2 PIPING MATERIALS

A. Refer to various application articles in Part 3 for applications of pipe, tube, fitting, and joining materials.

B. DRAINAGE PIPES AND FITTINGS

C. Perforated, PE Pipe and Fittings: ASTM F 405, corrugated, for coupled joints.

   1. Couplings: Manufacturer's standard, band type.

D. Perforated, PE Pipe and Fittings: ASTM F 667, corrugated, for coupled joints.

   1. Couplings: Manufacturer's standard, band type.

E. Perforated, PVC Sewer Pipe and Fittings: ASTM D 2729, bell-and-spigot ends.

F. Perforated, Concrete Pipe and Fittings: ASTM C 444/C 444M, Type 1, and applicable requirements of ASTM C 14/C 14M, Class 2, socket-and-spigot fittings.

   1. Gaskets: ASTM C 443/C 443M, rubber.

2.3 SPECIAL PIPE COUPLINGS

A. Description : ASTM C 1173. Rubber or elastomeric sleeve and band assembly fabricated to match outside diameters of pipes to be joined.

2.4 CLEANOUTS

A. Cast-Iron Pipe: ASME A112.36.2M; with round-flanged, cast-iron housing; and secured, scoriated, Medium-Duty Loading class, cast-iron cover. Include cast-iron ferrule and countersunk, brass cleanout plug.

B. PVC Pipe: ASTM D 3034, PVC cleanout threaded plug and threaded pipe hub.

2.5 DRAINAGE CONDUIT

A. Pipe and Fittings: Perforated and corrugated, molded from HDPE complying with ASTM D 3350, with fittings and geotextile filter fabric jacket.

1. Size: 12 inches (305 mm) high by approximately 3/4 inch (19 mm) thick with a minimum flow rate of 30 gpm per foot (62 L/s per 1000 mm).
2. Size: 18 inches (457 mm) high by approximately 3/4 inch (19 mm) thick with a minimum flow rate of 45 gpm per foot (93 L/s per 1000 mm) when tested according to ASTM D 4716.
3. Fittings: HDPE with combination NPS 4 and NPS 6 (DN 100 and DN 150) outlet connection.
4. Couplings: Corrugated HDPE band.

B. Pipe and Fittings: Perforated, molded from HDPE complying with ASTM D 1248 into shape of interconnected corrugated pipes, with fittings and geotextile filter fabric jacket.

1. Size: 6 inches (152 mm) high by approximately 1-1/4 inches (31 mm) thick with a flow rate of 15 gpm per foot (3.1 L/s per 1000 mm) when tested according to ASTM D 4716.
2. Size: 12 inches (305 mm) high by approximately 2-1/2 inches (64 mm) thick with a flow rate of 30 gpm per foot (6.2 L/s per 1000 mm) when tested according to ASTM D 4716.
3. Size: 18 inches (457 mm) high by approximately 3-3/4 inches (95 mm) thick with a flow rate of 45 gpm per foot (9.3 L/s per 1000 mm) when tested according to ASTM D 4716.
4. Fittings: HDPE with combination NPS 4 and NPS 6 (DN 100 and DN 150) outlet connection.
5. Couplings: HDPE.

C. Pipe and Fittings: Perforated, smooth PVC complying with ASTM D 4216 and ASTM D 2729.

1. Size: 6 inches (152 mm) to 8 inches (203 mm) (unless otherwise indicated) high by approximately 2-1/4 inches (57 mm) thick with a minimum flow rate equal to NPS 4 (DN 100) pipe.
2. Fittings: PVC with NPS 4 (DN 100) outlet connection.
3. Couplings: PVC.

2.6 GEOTEXTILE FILTER FABRICS

A. Woven or nonwoven geotextile filter fabric of PP or polyester fibers, or combination of both. Flow rates range from 110 to 330 gpm per sq. ft. (4480 to 13 440 L/min. per sq. m) when tested according to ASTM D 4491. Available styles are flat and sock.

2.8 PLASTIC DRAINAGE GRID

A. Lightweight injection-molded plastic units usually supplied in pallet format. Square units with hollow clover shaped cups rising from a strong open grid allowing maximum water infiltration and conveyance. Material shall be fabricated from a polyethylene/polypropylene copolymer. Protect material from damage during delivery and store under a tarp or out of sunlight when the time of delivery to installation exceeds 30 days.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces and areas for suitable conditions where subdrainage systems are to be installed.

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

3.2 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Section "Earthwork."

3.3 FOUNDATION DRAINAGE INSTALLATION

A. Bottom Impervious Fill: Place impervious fill material on subgrade adjacent to bottom of footing after concrete footings have been cured and forms removed. Place and compact impervious fill to dimensions indicated, but not less than 6 inches (150 mm) deep and 12 inches (300 mm) wide.

B. Drainage Fill: Place supporting layer of drainage fill over compacted subgrade to compacted depth of not less than 4 inches (100 mm). After installing drainage piping, add drainage fill to width of at least 6 inches (150 mm) on side away from wall and to top of pipe to perform tests. After satisfactory testing, cover piping to width of at least 6 inches (150 mm) on side away from footing and above top of pipe to within 12 inches (300 mm) of finish grade. Place drainage fill in layers not exceeding 3 inches (75 mm) in loose depth; compact each layer placed.

1. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with electrical tape.
2. After installing drainage fill, place one layer of flat-style geotextile filter fabric over top of drainage fill, overlapping edges at least 4 inches (100 mm).

C. Install vertical drainage panel as follows:

1. Coordinate placement with other drainage materials.
2. Lay perforated, PE or PVC drainage pipe at base of footing as described elsewhere in this Specification. Do not install aggregate.
3. Mark horizontal calk line on wall at a point 6 inches (150 mm) less than panel width above footing bottom. Before marking wall, subtract footing width.
4. Separate 4 inches (100 mm) of fabric at beginning of roll and cut away 4 inches (100 mm) of core. Wrap fabric around end of remaining core.
5. Wrap bottom of panel around drainage pipe.
6. Attach panel to wall at horizontal mark and at beginning of pipe. Place core side of panel against wall. Use concrete nails with washers through product cylinders to attach panel to wall. Place nails from 2 to 6 inches (50 to 150 mm) below top of panel, approximately 48 inches (1200 mm) apart. Some manufacturers use construction adhesives, metal stick pins, or double-sided tape. Do not penetrate waterproofing. Before using adhesives, discuss with waterproofing manufacturer.
7. If another panel is required on the same row, cut away 4 inches (100 mm) of installed panel core and wrap fabric over new panel.

8. If additional rows of panel are required, overlap lower panel with 4 inches (100 mm) of fabric.
9. Cut panel as necessary to keep top 12 inches (300 mm) below finish grade.
10. For inside corners, bend panel. For outside corners, cut core to provide 3 inches (75 mm) for overlap.
11. Do not use drainage panels as protection over waterproof membrane, unless otherwise approved by waterproofing membrane manufacturer.

D. Fill to Grade: Place native fill material over compacted drainage fill Place material in loose-depth layers not exceeding 6 inches (150 mm). Thoroughly compact each layer following recommendations in the geotech report. Fill to finish elevations and slope away from building.

3.4 RETAINING-WALL DRAINAGE INSTALLATION

A. Drainage Fill: Place supporting layer of drainage fill over compacted subgrade to compacted depth of not less than 4 inches (100 mm). After installing drainage piping, add drainage fill to width of at least 6 inches (150 mm) on side away from wall and to top of pipe to perform tests. After satisfactory testing, cover piping to width of at least 6 inches (150 mm) on side away from footing and above top of pipe to within 12 inches (300 mm) of finish grade. Place drainage fill in layers not exceeding 3 inches (75 mm) in loose depth; compact each layer placed.

1. Before installing drainage fill, lay flat-style geotextile filter fabric in trench and overlap trench sides. After installing drainage fill, wrap top of drainage fill with flat-style geotextile filter fabric.
2. Encase pipe with sock-style geotextile filter fabric before installing pipe. Connect sock sections with electrical tape.
3. After installing drainage fill, place one layer of flat-style geotextile filter fabric over top of drainage fill, overlapping edges at least 4 inches (100 mm).
4. Mark horizontal calk line on wall at a point 6 inches (150 mm) less than panel width above footing bottom. Before marking wall, subtract footing width.
5. Separate 4 inches (100 mm) of fabric at beginning of roll and cut away 4 inches (100 mm) of core. Wrap fabric around end of remaining core.
6. Wrap bottom of panel around drainage pipe.

B. Fill to Grade: Place native fill material over compacted drainage fill Place material in loose-depth layers not exceeding 6 inches (150 mm). Thoroughly compact each layer following recommendations of the geotech report. Fill to finish grade.

3.5 PIPING INSTALLATION

A. Install piping beginning at low points of system, true to grades and alignment indicated, with unbroken continuity of invert. Bed piping with full bearing in filtering material. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions and other requirements indicated.

1. Foundation Subdrainage: Install piping pitched down in direction of flow, at a minimum slope of 0.5 percent and with a minimum cover of 36 inches (915 mm), unless otherwise indicated.
2. Underslab Subdrainage: Install piping pitched down in direction of flow, at a minimum slope of 0.5 percent.
3. Retaining-Wall Subdrainage: When water discharges at end of wall into stormwater piping system, install piping pitched down in direction of flow, at a minimum slope of 0.5 percent and with a minimum cover of 36 inches (915 mm), unless otherwise indicated.

However, when water discharges through wall weep holes, pipe may be installed with a minimum slope of zero percent.

4. Lay perforated pipe with perforations down.
5. Excavate recesses in trench bottom for bell ends of pipe. Lay pipe with bells facing upslope and with spigot end entered fully into adjacent bell.

B. Use increasers, reducers, and couplings made for different sizes or materials of pipes and fittings being connected. Reduction of pipe size in direction of flow is prohibited.

C. Install PE piping according to ASTM D 2321.

D. Install PVC piping according to ASTM D 2321.

E. Install concrete piping according to ACPA's "Concrete Pipe Handbook."

3.6 PIPE JOINT CONSTRUCTION

A. Join PE pipe, tubing, and fittings with couplings for soiltight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4, "Joint Properties."

B. Join perforated, PE pipe and fittings with couplings for soiltight joints according to AASHTO's "Standard Specifications for Highway Bridges," Division II, Section 26.4.2.4, "Joint Properties"; or according to ASTM D 2321.

C. Join PVC pipe and fittings according to ASTM D 3034 with elastomeric seal gaskets according to ASTM D 2321.

D. Join perforated, PVC pipe and fittings according to ASTM D 2729, with loose, bell-and-spigot joints.

E. Join perforated, concrete pipe and fittings with gaskets according to ASTM C 443/C 443M.

F. Special Pipe Couplings: Join piping made of different materials and dimensions with special couplings made for this application. Use couplings that are compatible with and that fit both pipe materials and dimensions.

3.7 FOUNDATION RETAINING-WALL AND LANDSCAPING SUBDRAINAGE CLEANOUT INSTALLATION

A. Install cleanouts from subdrainage piping to grade. Locate cleanouts at beginning of piping run and at changes in direction. Install fittings so cleanouts open in direction of flow in piping.

B. In vehicular-traffic areas, use NPS 4 (DN 100) cast-iron soil pipe and fittings for subdrainage piping branch fittings and riser extensions to cleanout plug. Set cleanout frames and covers in a cast-in-place concrete anchor, 18 by 18 by 12 inches (450 by 450 by 300 mm) in depth. Set top of cleanout plug flush with grade. Cast-iron pipe may also be used for cleanouts in nonvehicular-traffic areas.

C. In nonvehicular-traffic areas, use NPS 4 (DN 100) PVC pipe and fittings for subdrainage piping branch fittings and riser extensions to cleanout plug. Set cleanout frames and covers in a cast-in-place concrete anchor, 12 by 12 by 4 inches (300 by 300 by 100 mm) in depth. Set top of cleanout plug 1 inch (25 mm) above grade.

3.11 PERMEABLE PAVEMENT AREAS

A. Absolutely no installation of sub-surface drainage system materials shall begin without the prior approval of subbase by Owner, Field Engineer and Geo-technical Engineer. Subbase elevations of the areas shall strictly conform to the grading plan for the permeable area..

B. Install the geotextile across entire subbase. The fabric shall be installed in a roof shingle like pattern with the upslope piece overlapping the down-slope piece.

C. Install the flat drains as indicated on the drawings connecting to the storm drainage system.

D. Install stone over flat drains using properly sized equipment to prevent damage to the flat drains.

3.12 CONNECTIONS

A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect low elevations of subdrainage system to solid building storm drainage system.

3.13 FIELD QUALITY CONTROL

A. Testing: After installing drainage fill to top of pipe, test drain piping with water to ensure free flow before backfilling. Remove obstructions, replace damaged components, and repeat test until results are satisfactory.

3.14 CLEANING

A. Clear interior of installed piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of each day or when work stops.

END OF SECTION 334600

SECTION 334900 - STORM DRAINAGE STRUCTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes storm drainage outside the building.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: Contract descriptions, description of alterations work, work by others, future work, occupancy conditions, use of site and premises, work sequence.

B. Section 012000 - Price and Payment Procedures: Applications for payment, Schedule of Values, modifications procedures, closeout procedures.

C. Section 012200 - Unit Prices: Descriptions of unit price items, administrative requirements.

D. Section 015713 - Temporary Erosion and Sedimentation Control.

1.03 PRICE AND PAYMENT PROCEDURES

A. Unit Prices: See Section 012200 - Unit Prices, for additional unit price requirements.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate Typical precast structure.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.07 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sherman Dixie Precast Concrete Products, Lexington, KY

B. Cloud / Oldcastle Concrete

2.02 CATCH BASINS AND MANHOLES

A. Precast Concrete Catch Basins and Manholes: ASTM C 478, precast, reinforced concrete, of depth shape and dimensions indicated, with provision for rubber gasketed joints, and as required by authorities having jurisdiction

B. Cast-in-Place Concrete, Catch Basins and Manholes: Construct of reinforced concrete; designed according to ASTM C 890 for structural loading; of depth, shape, dimensions, and appurtenances indicated.
   1. Bottom, Walls, and Top: Reinforced concrete.
   2. Channels and Benches: Concrete.

C. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for heavy-duty service, unless otherwise shown on the drawings. Include flat grate with small square or short-slotted drainage openings.

2.03 STORMWATER INLETS

A. Curb Inlets: Made with vertical curb opening per plans and details, of materials and dimensions according to plans, details, and utility standards.

B. Gutter Inlets: Made with horizontal gutter opening, per plans and details, of materials and dimensions according to plans, details, and utility standards. Include heavy-duty frames and grates.

C. Combination Inlets: Made with vertical curb and horizontal gutter openings per plans and details, of materials and dimensions according to plans, details, and utility standards. Include heavy-duty frames and grates.

D. Frames and Grates: Heavy duty

2.04 CLEANOUTS

A. Gray-Iron Cleanouts: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug. Use units with top-loading classifications according to the following applications:
   1. Light Duty: In earth or grass foot-traffic areas.
   2. Medium Duty: In paved foot-traffic areas.
   3. Heavy Duty: In vehicle-traffic service areas.
   4. Extra-Heavy Duty: In roads.
   5. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

B. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

2.05 DRAINS

A. Gray-Iron Area Drains: ASME A112.21.1M, round, gray-iron body with anchor flange and round, secured, gray-iron grate. Include bottom outlet with inside calk or spigot connection, of sizes indicated. Use units with top-loading classifications according to the following applications:
   1. Medium Duty: In paved foot-traffic areas.
   2. Heavy Duty: In vehicle-traffic service areas.

2.06 PIPE OUTLETS

A. Head Walls: Cast-in-place or precast reinforced concrete, with apron (as shown on the drawings.)

B. Riprap Basins: Broken, irregular size and shape, graded stone.

1. Average Size: KTC, Class II channel lining.

C. Filter Stone: KTC #8, #9 or 9M graded stone.

D.

PART 3 EXECUTION

3.01 INSTALLERS

A. Installer List: Qualified installers shall be contractors who have successfully installed and performed on 5 previous similiar scale projects

3.02 DRAIN INSTALLATION

A. Install type of drains in locations indicated.

B. Embed drains in 4-inch (100-mm) minimum depth of concrete around bottom and sides.

C. Fasten grates to drains if indicated.

D. Set drain frames and covers with tops flush with pavement surface.

3.03 CLEANOUT INSTALLATION

A. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 4 inches (450 by 450 by 100 mm) deep. Set with tops flush with the surrounding earth grade.

C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

3.04 TAP CONNECTIONS

A. Make connections to existing piping and underground structures so finished Work complies as nearly as practical with requirements specified for new Work.

B. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.

C. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.

D. Make branch connections from side into existing piping, NPS 21 or larger, or to underground structures by cutting opening into existing unit large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall, unless otherwise indicated. On outside of pipe or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
   1. Use concrete that will attain minimum 28-day compressive strength of 3000 psi, unless otherwise indicated.
   2. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
   3. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.05 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in

place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:

1. Close open ends of piping with at least 8-inch- thick, brick masonry bulkheads.
2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

B. Abandoned Structures: Excavate around structure as required and use one procedure below:

END OF SECTION

SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION

110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

CONSTRUCTION DOCUMENTS
FEBRUARY 26, 2025

OWNER:

SPENCER COUNTY BOARD OF EDUCATION

DR. WILLIE FOSTER, SUPERINTENDENT
SANDY CLEVENGER, BOARD CHAIR
DR. LYNN SHELBURNE, VICE CHAIR
PAMELA SLONE
TIMOTHY TRUITT
JASON PHELPS

INDEX TO DRAWINGS

CODE INFORMATION

GENERAL BUILDING CODE INFORMATION

SPENCER COUNTY PUBLIC SCHOOL BOARD OFFICE ADDITION AND RENOVATION

CODE:	2018 KENTUCKY BUILDING CODE, 3RD EDITION, MAY 2020
USE GROUP:	BUSINESS, GROUP "B"
CONSTRUCTION TYPE:	TYPE "V-B"
FIRE PROTECTION:	PARTIALLY SPRINKLERED (NO FIRE PROTECTION FOR CODE CALC. PURPOSES)
ALLOWABLE HEIGHT:	2-STORIES / 40'-0'
ACTUAL BUILDING HEIGHT:	1-STORY
ALLOWABLE AREA:	9,000 SF $\frac{W}{30}$ $\frac{30}{30}$
FRONTAGE INCREASE FACTOR:	If = [f/p - .25] If = [448 / 600 -.25] If = 0.5
ALLOWABLE AREA WITH FRONTAGE INCREASE:	Aa = [9,000 + (9,000 x 0.5)] 13,500 SF Aa = 13,500 SF
EXISTING BUILDING AREA:	10,447 SF
BUILDING AREA WITH ADDITION:	10,889 SF

NOTE: NO EXISTING WALL CAVITY OR ATTIC INSULATION IS EXPOSED OR REDUCED BY NEW CONSTRUCTION. INSULATION VALUES ARE IMPROVED AT PORTIONS OF EXTERIOR WALLS TO RECEIVE NEW METAL WALL PANELS AND RIGID INSULATION. NEW CONSTRUCTION PROVIDES INSULATED ENVELOPE IN COMPLIANCE WITH CURRENT CODE AND ENERGY REQUIREMENTS

SHERMAN CARTER BARNHART ARCHITECTS

SHERMAN CARTER BARNHART ARCHITECTS, PLLC

PROJECT MANAGER:
ALLISON COMMINGS, AIA

144 TURNER COMMONS WAY
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STRUCTURAL ENGINEER
POAGE ENGINEERS & ASSOCIATES
880 Sparta Ct. Suite 200
Lexington, KY 40504
Phone: (859) 255-9034
Fax: (859) 252-3130

MECHANICAL/ ELECTRICAL ENGINEER
SHROUT TATE WILSON CONSULTING ENGINEERS
628 WINCHESTER ROAD
LEXINGTON, KENTUCKY 40505
P (859) 277-8177

SCB PROJECT NO. 2448

2448
SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
3/10/2025 2:44:46 PM

SPENCER COUNTY SCHOOLS

PLAT OF SURVEY
FOR

SITUATED IN
SPENCER COUNTY
KENTUCKY

SURVEYOR'S CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAT DIRECTS A SURVEY MADE BY ME OR UNDER MY DIRECT SUPERVISION AND MEETS THE REQUIREMENTS OF A CLASS A (URBAN) SURVEY. THIS SURVEY WAS CONDUCTED USING FIX GPS PROCEDURES USING A JAVAD TRIUMPH 3 BASE AND A JAVAD TRIUMPH LS ROVER. THE RELATIVE POSITIONAL ACCURACY FOR ANY ONE POINT ON THIS SURVEY DOES NOT EXCEED 0.05' + 100PPM. THIS PLAT MEETS OR EXCEEDS THE MINIMUM STANDARDS OF PRACTICE FOR PROFESSIONAL SURVEYORS IN KENTUCKY.

MATTHEW D. SIBOLE — 9-9-24
LS 3869 @ SIBOLE, PLS 3869 — DATE

MATTHEW D. SIBOLE
3869
STATE OF KENTUCKY
PROFESSIONAL
LAND SURVEYOR

TOPOGRAPHIC SURVEY

PROPERTY BELONGING TO
SPENCER COUNTY BOARD OF EDUCTION
520 TAYLORSVILLE ROAD
TAYLORSVILLE, KENTUCKY 40071

TOPOGRAPHIC SURVEY OF
ALL OF THE LANDS AS CONVEYED BY DEED TO SPENCER COUNTY BOARD OF EDUCATION IN D.B. 55, PG. 376 & PART OF TRACT 1 AND ALL OF TRACT 2 AS CONVEYED BY DEEDD TO SPENCER COUNTY PUBLIC SCHOOL CORPORATION IN DEED BOOK 40, PAGE 535 OF THE SPENCER CO. KY CLERK'S RECORDS

LOCATED WEST OF JEFFERSON STREET SOUTH OF REASOR AVE.
IN TAYLORSVILLE, KENTUCKY

SCALE: 1"= 20'	MATTHEW SIBOLE SURVEYING
DATE: 9/9/24	PROUDLY SERVING ALL OF KENTUCKY
REV: 11/4/24	P.O. BOX 1008
DWN BY: M.D.S	BRANDENBURG, KENTUCKY 40108
JOB NO.: 24020	270-422-7737

LEGEND

- DENOTES 5/8" IRON PIN FOUND
- OTHERWISE NOTED
- DENOTES LIGHT POLE
- DENOTES UTILITY POLE
- DENOTES SANITARY MAN HOLE
- DENOTES OVERHEAD ELECTRIC
- DENOTES UNDERGROUND ELECTRIC
- DENOTES WATER LINE
- DENOTES GAS LINE

GRAPHIC SCALE IN FEET
0 10 20 30 40

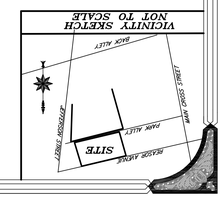
ALL DATA SHOWN HEREON IS BASED ON KENTUCKY SINGLE ZONE STATE PLANE COORDINATE SYSTEM NAD83 (2011) EPOCH 2010. ALL ELEVATION ARE NAVD88 (GEOID12B).

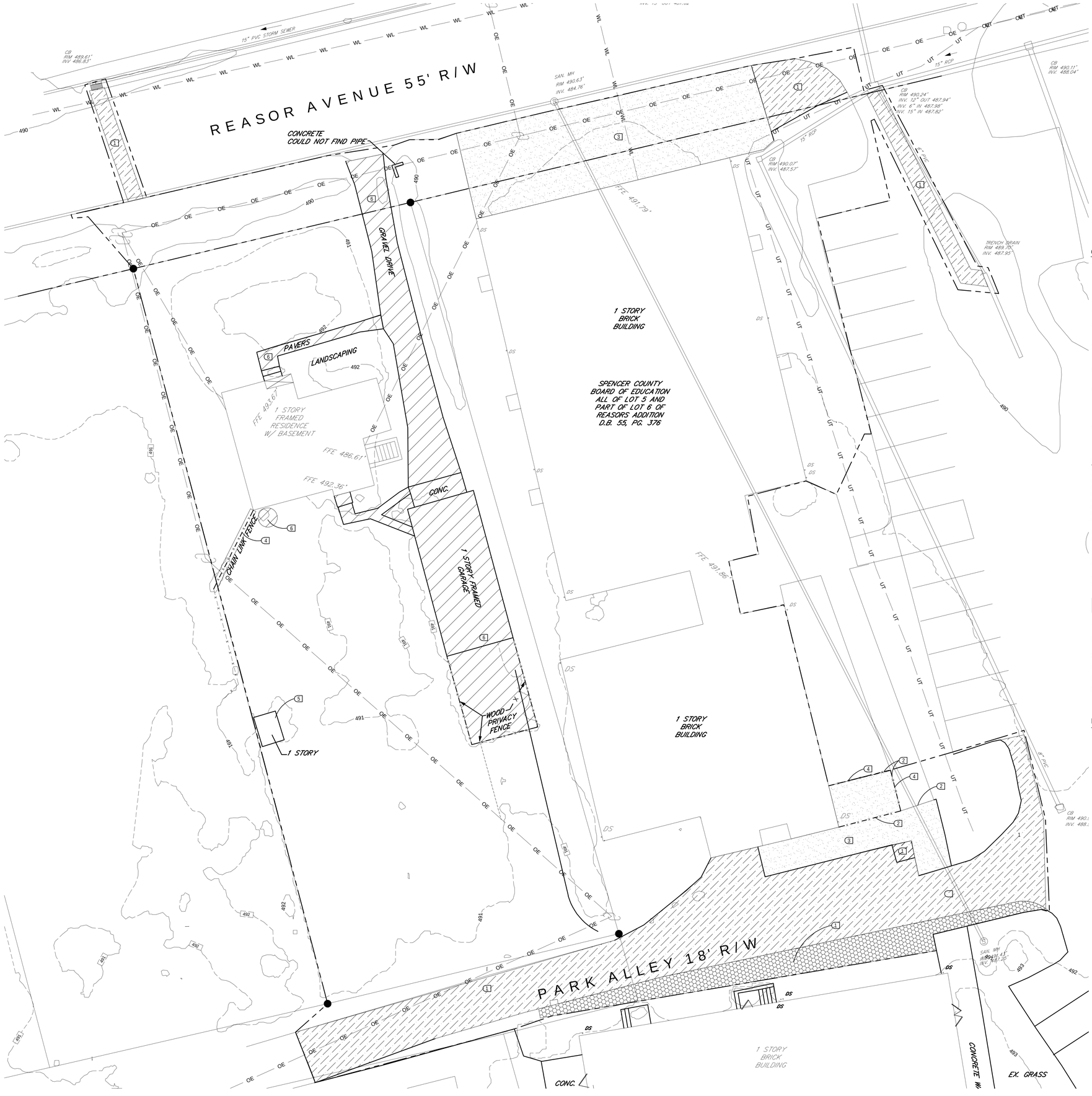
NOTE: NO TILE REPORT WAS PROVIDED FOR THIS SURVEY. NO SUBSURFACE LOCATION HAS BEEN COMPLETED AND THEREFOR ALL UNDERGROUND UTILITIES SHOULD BE FIELD VERIFIED PRIOR TO ANY CONSTRUCTION.

NO UNDERGROUND UTILITY LOCATION SERVICES WERE COMPLETED PRIOR TO THIS SURVEY OR UP TO THE EFFECTIVE DATE ON THIS SURVEY. ALL UTILITY LOCATIONS MUST BE VERIFIED PRIOR TO ANY EXCAVATION.

PART OF THIS PROPERTY IS IN THE AREA WITH FLOOD RISK DUE TO LEVEE (ZONE D) AND PART IS IN AREA OF MINIMAL FLOOD HAZARD (ZONE X) AS SHOWN ON FEMA FLOOD MAP 21215001115 EFFECTIVE DATE 6/3/2009

VICINITY SKETCH
NOT TO SCALE





JOB SITE SAFETY

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SITE SAFETY DURING CONSTRUCTION. JOB SITE SAFETY IS OUTSIDE THE SCOPE OF WORK OF SHERMAN CARTER BARNHART (SCB). NEITHER THE PROFESSIONAL ACTIVITIES OR THE PRESENCE OF SCB EMPLOYEES OR SUBCONSULTANTS AT THE CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR OR ANY OTHER ENTITY OF THEIR OBLIGATION, DUTIES, AND RESPONSIBILITIES INCLUDED, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCES, TECHNIQUES, TO PROCEDURES NECESSARY FOR PERFORMING SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ANY HEALTH AND SAFETY PRECAUTIONS REQUIRED BY GOOD CONSTRUCTION PRACTICES OR ANY REGULATORY AGENCIES. ANYONE USING INFORMATION FROM THESE PLANS ACKNOWLEDGES AND WARRANTS THAT SHERMAN CARTER BARNHART IS NOT RESPONSIBLE FOR SITE SAFETY IN ANY WAY.

GENERAL DEMOLITION NOTES:

1. SITE DEMOLITION DRAWINGS ARE INTENDED TO GENERALLY SHOW THE DEMOLITION NECESSARY TO COMPLETE THE NEW WORK. THE CONTRACTOR SHALL REVIEW ALL DOCUMENTS AND VISIT AND OBSERVE THE SITE PRIOR TO SUBMITTING HIS BID AND SHALL INCLUDE IN HIS BID ALL WORK NECESSARY TO ACCOMPLISH THE NEW WORK, WHETHER OR NOT SHOWN ON THESE DEMOLITION DRAWINGS.
2. NO TREES EXISTING OR PROPOSED ON SITE.
3. REFER TO SITE UTILITY PLANS FOR DEMOLITION AND/OR RELOCATION OF UTILITIES.
4. FOR CONCRETE REMOVAL, REMOVE TO THE NEAREST CONSTRUCTION JOINT. PROVIDE A CLEAN SAW CUT JOINT TO ALL EXISTING EDGES OF CONCRETE TO REMAIN.
5. ALL DEMOLISHED MATERIALS NOT SPECIFICALLY NOTED TO BE RETURNED TO OWNER, ARE TO BE PROPERLY DISPOSED OF OFFSITE.
6. ALL FOUND MEMORIAL MONUMENTS SHALL BE SALVAGED AND RETURNED TO OWNER.
7. ALL EXISTING SITE FURNISHINGS AND TRASH RECEPTACLES, WITHIN DEMOLITION AREAS, SHALL BE SALVAGED AND RETURNED TO OWNER.
8. REFER TO PHASING NOTES SHEET SD1.0

UTILITIES

THE UTILITIES ARE SHOWN ON THE DRAWINGS AS ACCURATELY AS THEY HAVE BEEN PROVIDED TO THE ARCHITECT. THEIR LOCATIONS ARE NOT GUARANTEED. IT IS THE CONTRACTORS RESPONSIBILITY TO CONTACT ALL UTILITY COMPANIES AND TO HAVE ALL UTILITIES FIELD LOCATED, PRIOR TO STARTING CONSTRUCTION. THE UTILITIES SHOWN REPRESENT OBSERVABLE FEATURES ALONG WITH INFORMATION PROVIDED BY THE RESPECTIVE UTILITY COMPANIES, AND IS THEREFORE NOT WARRANTED. PRIOR TO CONSTRUCTION THE CONTRACTOR IS TO FIELD VERIFY ALL UTILITY LOCATIONS, SIZES, TYPE ETC. NEEDED TO COMPLETE THE WORK OF THE CONTRACT.

THE CONTRACTOR SHALL NOTIFY THE ARCHITECT IF A CONFLICT IS ANTICIPATED. IF THE CONTRACTOR PROCEEDS WITHOUT CONTACTING THE UTILITY COMPANIES AND DOES NOT NOTIFY THE ARCHITECT OF POTENTIAL CONFLICTS HE DOES SO AT HIS OWN RISK.

ANY EXISTING SANITARY SEWER PROPERTY SERVICE CONNECTIONS SHALL BE CAPPED PER CITY OF TAYLORSVILLE SPECIFICATIONS.

A CITY INSPECTOR MUST BE PRESENT FOR SEWER CAPS. THE CONTRACTOR MUST MAKE SURE ALL LINES TO BE CAPPED ARE NOT LIVE LINES.

SITE DEMOLITION KEY

1. EXISTING PAVING AND GRAVEL SUB-BASE TO BE REMOVED COMPLETELY. COORDINATE LIMITS WITH SITE DEVELOPMENT AND SITE UTILITY DRAWINGS.
2. SAW CUT TO PROVIDE CLEAN EDGE. COORDINATE EXACT LOCATIONS WITH SITE DEVELOPMENT AND SITE UTILITY DWGS.
3. EXISTING CONCRETE SIDEWALK TO BE REMOVED COMPLETELY.
4. EXISTING FENCE TO BE REMOVED COMPLETELY, INCLUDING POST FOOTINGS
5. EXISTING OUT BUILDING AND FOUNDATION TO BE REMOVED COMPLETELY.
6. VARIOUS ITEMS TO BE DEMOLISHED PRIOR TO CONSTRUCTION (NOT IN CONTRACT)

LEGEND

- LIMITS OF CONSTRUCTION
- CONTRACTOR SHALL REMOVE EXISTING ASPHALT AND STONE BASE COMPLETELY. UNDERCUT SUBGRADE MATERIAL AS REQUIRED TO CONSTRUCT NEW ASPHALT SECTION. TOP ON NEW ASPHALT SHALL BE FLUSH WITH TOP OF ADJACENT EXISTING ASPHALT.
- CONTRACTOR SHALL REMOVE EXISTING CONCRETE AND STONE BASE COMPLETELY. UNDERCUT SUBGRADE MATERIAL AS REQUIRED TO CONSTRUCT NEW CONCRETE SECTION.
- CONTRACTOR SHALL REMOVE EXISTING STONE/GRAVEL COMPLETELY.
- VARIOUS ITEMS TO BE DEMOLISHED PRIOR TO CONSTRUCTION (NOT IN CONTRACT)

SCALE: 1" = 10'-0" SCALE IN FEET

0 5 10 30

SHERMAN CARTER BARNHART ARCHITECTS

STATE OF KENTUCKY DAVID MICHAEL DIAZ 1021 REGISTERED LANDSCAPE ARCHITECT

SPENCER COUNTY BOARD OFFICE RENOVATION, PROPERTY ACQUISITION, NEW PARKING LOT

TAYLORSVILLE, KENTUCKY

SITE DEMOLITION PLAN

JOB NO.	2448
DATE	02/26/2025
DRAWN	DMD
CHECKED	D. DGLS.

REVISIONS

No.	Description	Date

SHEET

DS-1.0

X:\Projects\2024\2448\6_SITE\2448 SD1X.dwg
Day & Time: Feb 26, 2025 - 5:15pm
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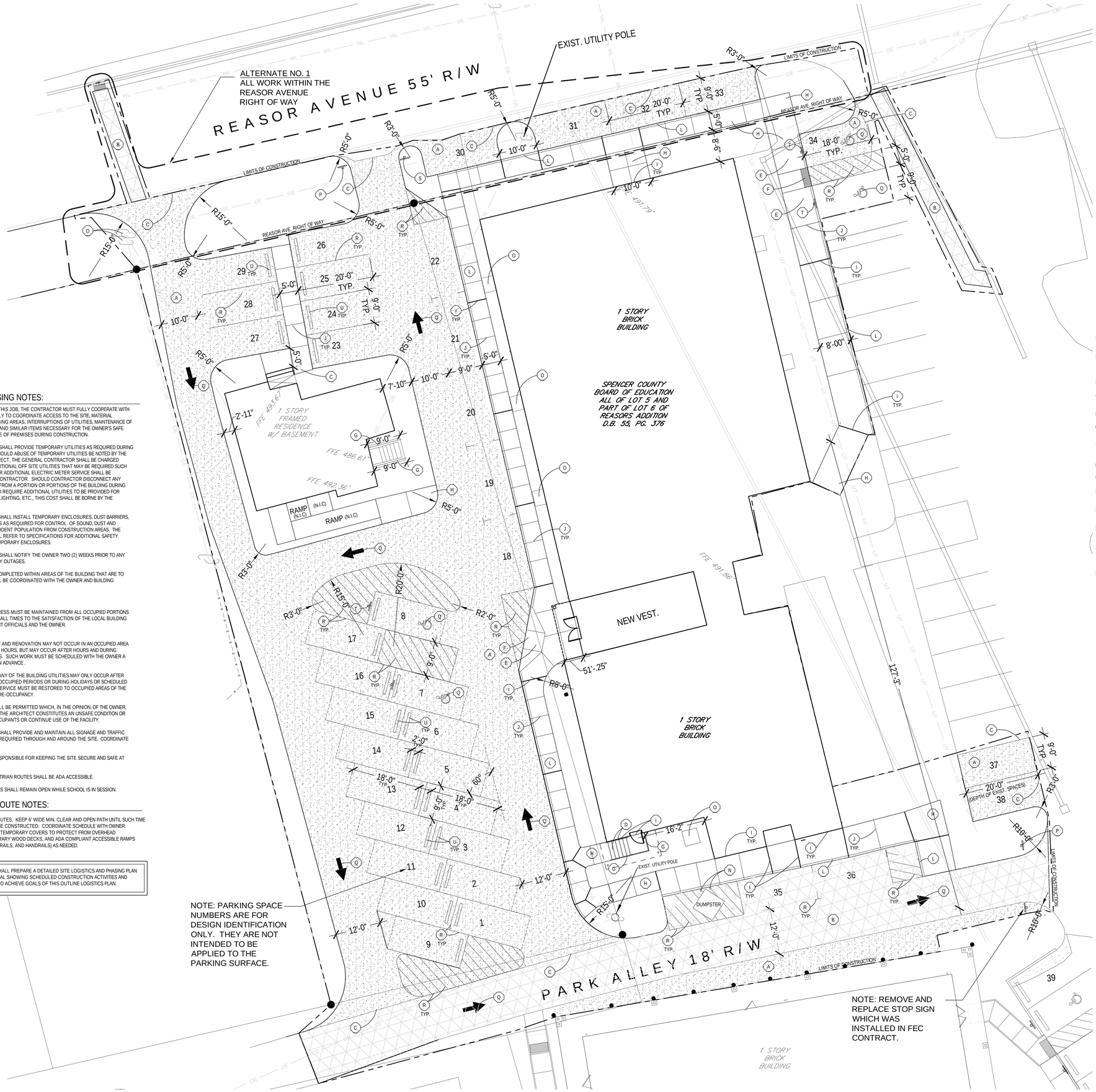

GENERAL PHASING NOTES:

1. IN ALL PHASES OF THIS JOB, THE CONTRACTOR MUST FULLY COOPERATE WITH THE OWNER CLOSELY TO COORDINATE ACCESS TO THE SITE, MATERIAL STORAGE AND STAGING AREAS, INTERRUPTIONS OF UTILITIES, MAINTENANCE OF MEANS OF EGRESS AND SIMILAR ITEMS NECESSARY FOR THE OWNER'S SAFE OPERATION AND USE OF PREMISES DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL PROVIDE TEMPORARY UTILITIES AS REQUIRED DURING CONSTRUCTION. SHOULD ABUSE OF TEMPORARY UTILITIES BE NOTED BY THE OWNER AND ARCHITECT, THE GENERAL CONTRACTOR SHALL BE CHARGED ACCORDINGLY. ADDITIONAL OFF SITE UTILITIES THAT MAY BE REQUIRED SUCH AS PROPANE GAS OR ADDITIONAL ELECTRIC METER SERVICE SHALL BE PROVIDED BY THE CONTRACTOR. SHOULD CONTRACTOR DISCONNECT ANY EXISTING UTILITIES FROM A PORTION OR PORTIONS OF THE BUILDING DURING CONSTRUCTION AND REQUIRE ADDITIONAL UTILITIES TO BE PROVIDED FOR TEMPORARY HEAT, LIGHTING, ETC., THIS COST SHALL BE BORNE BY THE CONTRACTOR.
3. THE CONTRACTOR SHALL INSTALL TEMPORARY ENCLOSURES, DUST BARRIERS, AND EGRESS DOORS AS REQUIRED FOR CONTROL OF SOUND, DUST AND SEPARATION OF STUDENT POPULATION FROM CONSTRUCTION AREAS. THE CONTRACTOR SHALL REFER TO SPECIFICATIONS FOR ADDITIONAL SAFETY MEASURES AND TEMPORARY ENCLOSURES.
4. THE CONTRACTOR SHALL NOTIFY THE OWNER TWO (2) WEEKS PRIOR TO ANY ANTICIPATED UTILITY OUTAGES.
5. ALL WORK TO BE COMPLETED WITHIN AREAS OF THE BUILDING THAT ARE TO REMAIN OPEN SHALL BE COORDINATED WITH THE OWNER AND BUILDING OCCUPANTS.
6. THE MEANS OF EGRESS MUST BE MAINTAINED FROM ALL OCCUPIED PORTIONS OF THE FACILITY AT ALL TIMES TO THE SATISFACTION OF THE LOCAL BUILDING CODE ENFORCEMENT OFFICIALS AND THE OWNER.
7. MINOR DEMOLITION AND RENOVATION MAY NOT OCCUR IN AN OCCUPIED AREA DURING OPERATING HOURS, BUT MAY OCCUR AFTER HOURS AND DURING UNOCCUPIED HOURS. SUCH WORK MUST BE SCHEDULED WITH THE OWNER A MIN. OF (2) WEEKS IN ADVANCE .
8. INTERRUPTION OF ANY OF THE BUILDING UTILITIES MAY ONLY OCCUR AFTER HOURS, DURING UNOCCUPIED PERIODS OR DURING HOLIDAYS OR SCHEDULED VACATIONS. FULL SERVICE MUST BE RESTORED TO OCCUPIED AREAS OF THE FACILITY PRIOR TO RE-OCCUPANCY.
9. NO CONDITIONS WILL BE PERMITTED WHICH, IN THE OPINION, OF THE OWNER, CODE OFFICIAL, OR THE ARCHITECT CONSTITUTES AN UNSAFE CONDITION OR HAZARD TO THE OCCUPANTS OR CONTINUE USE OF THE FACILITY.
10. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL SIGNAGE AND TRAFFIC CONTROL DEVICES REQUIRED THROUGH AND AROUND THE SITE. COORDINATE WITH THE OWNER.
11. CONTRACTOR IS RESPONSIBLE FOR KEEPING THE SITE SECURE AND SAFE AT ALL TIMES.
12. TEMPORARY PEDESTRIAN ROUTES SHALL BE ADA ACCESSIBLE.
13. ALL EXISTING DRIVES SHALL REMAIN OPEN WHILE SCHOOL IS IN SESSION.

PEDESTRIAN ROUTE NOTES:

FOR ALL PEDESTRIAN ROUTES, KEEP 6' WIDE MIN. CLEAR AND OPEN PATH UNTIL SUCH TIME THAT NEW WALKS WILL BE CONSTRUCTED. COORDINATE SCHEDULE WITH OWNER. ROUTES SHALL INCLUDE TEMPORARY COVERS TO PROTECT FROM OVERHEAD CONSTRUCTION, TEMPORARY WOOD DECKS, AND ADA COMPLIANT ACCESSIBLE RAMPS (WITH LANDINGS, GUARDRAILS, AND HANDRAILS) AS NEEDED.

THE CONTRACTOR SHALL PREPARE A DETAILED SITE LOGISTICS AND PHASING PLAN FOR OWNER APPROVAL SHOWING SCHEDULED CONSTRUCTION ACTIVITIES AND FENCING OF AREAS TO ACHIEVE GOALS OF THIS OUTLINE LOGISTICS PLAN.

SITE DETAILS KEY

KEY	DESCRIPTION	DETAIL
A	HEAVY DUTY ASPHALT PAVEMENT	AP / SD-3.0
B	ASPHALT MILL AND OVERLAY	AP / SD-3.0
C	EDGE KEY	EK / SD-3.0
D	CONCRETE STEPS AND HANDRAIL	CS/HR / SD-3.0
E	CONCRETE RAMP	CR / SD-3.0
F	A.D.A. TACTILE DETECTABLE WARNING SURFACE	TS / SD-3.0
G	GUARDRAIL	GR / SD-3.0
H	CONCRETE WALK	CW / SD-3.0
I	1/2" EXPANSION JOINT MATERIAL W / SEALANT (TYP.)	
J	1/4" TOOLED CONTROL JOINT (TYP.)	
K	NOT USED	
L	CONCRETE WALK WITH TURNED DOWN EDGE	TW / SD-3.0
M	NOT USED	
N	PIPE BOLLARD	BD / SD-3.0
O	SITE UTILITY	SEE MECH/ELEC
P	DO NOT ENTER SIGN	SS / SD-3.0
Q	PAVEMENT APPLIED GRAPHICS	PG / SD-3.0
R	4" WIDE WHITE PAINT STRIPE (TYP.)	SEE SPECS.
S	STOP SIGN	SS / SD-3.0
T	ACCESSIBLE PARKING SIGN	AS / SD-3.0
U	CONCRETE WHEEL STOP	WS / SD-3.0

GENERAL SITE NOTES:

1. PROVIDE 1/2" EXP. JT. MATERIAL W / SEALANT WHERE NEW CONC. CURBS, WALKS, OR PAVING ABUT STORM SEWER STRUCTURES, BUILDINGS, ETC.
2. AT END OF PROJECT, CONTRACTOR SHALL REMOVE ALL TEMPORARY FENCING, TEMPORARY EROSION CONTROL STRUCTURES, AND OTHER TEMPORARY SERVICES ON SITE.
3. ALL RADII ARE TO BE 5' UNLESS SHOWN OTHERWISE.
4. CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL LOCAL, STATE, FEDERAL GOVERNING AGENCIES.
5. ALL PERMITS AND BONDS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
6. ANY AREAS DAMAGED SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
7. UTILITIES ON THIS SHEET ARE FOR REFERENCE ONLY, REFER TO UTILITY DRAWINGS FOR LOCATIONS. UNLESS OTHERWISE SHOWN ON THIS SHEET.
8. ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS SHOWN OTHERWISE.
9. NO TREES ON THIS SITE.
10. CONTRACTOR TO COORDINATE STAGING, CONSTRUCTION ENTRANCE, AND NEW WORK WITH OWNER.
11. REFER TO MECH/ELEC/PLUM SITE UTILITY SHEETS FOR ADDITIONAL CUT AND PATCHING OF PAVEMENTS.
12. REFER TO STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR CONCRETE WALK CONNECTION TO BUILDING SLAB AT DOORWAYS.
13. CAD FILES WILL BE AVAILABLE TO SUCCESSFUL CONTRACTOR FOR LAYOUT PURPOSES UPON CONTRACTOR SIGNING OF RELEASE FORM. ANY ADDITIONAL DIMENSIONS REQUIRED FOR LAYOUT SHALL BE REQUESTED BY THE CONTRACTOR.
14. WHERE NEW WORK OCCURS IN EXISTING PAVEMENT, CONTRACTOR SHALL CUT AND PATCH PAVEMENT AS REQUIRED TO COMPLETE NEW WORK AND RESTORE PAVEMENT. MATCH PAVEMENT TYPE. SEE SPECIFIC DETAILS FOR NEW PAVEMENT SECTIONS. IF SPECIFIC DETAIL IS NOT INCLUDED CONTRACTOR SHALL MATCH EXISTING PAVEMENT SECTION. FOR ASPHALT PATCHING SEE DETAIL EK/AS2.0 FOR EDGE KEY. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL DRAWINGS INCLUDING ALL SITE UTILITY DRAWINGS AND ASSOCIATED UTILITY TRENCHING

LEGEND

PROPERTY LINE (LIMITS OFCONSTRUCTION)

CONCRETE WALK - CW / SD-3.0

KEY TO SHADING

HEAVY DUTY ASPHALT PAVEMENT

ASPHALT MILLING AND OVERLAY
SEE DETAIL AP/SD3.0:1

SCALE: 1" = 10'-0"

SCALE IN FEET
0 5 10 30

SHERMAN CARTER BARNHART ARCHITECTS

STATE OF KENTUCKY
DAVID MONROE DIAZ
1021
REGISTERED LANDSCAPE ARCHITECT

SPENCER COUNTY BOARD OFFICE RENOVATION, PROPERTY ACQUISITION, NEW PARKING LOT

TAYLORSVILLE, KENTUCKY

SITE DEVELOPMENT PLAN

JOB NO.	2448
DATE	02/26/2025
DRAWN	DMD
CHECKED	D. DGLS.

REVISIONS

No.	Description	Date

SHEET

SD-1.0

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GRADING SITE LEGEND

REFER TO TOPOGRAPHIC SURVEY FOR EXISTING UTILITIES LEGEND

SYMBOLS	DESCRIPTION
500	EXISTING CONTOUR MINOR
500	EXISTING CONTOUR MAJOR
500	PROPOSED CONTOUR MINOR
500	PROPOSED CONTOUR MAJOR
×979.5	EXISTING SPOT ELEVATION
979.55	PROPOSED SPOT ELEVATION (AT GUTTER LINE ADD 6" FOR TOP OF CURB ELEVATION)
979.55 FL	CHANNEL FLOW LINE ELEVATION
979.55 HP	SPOT ELEVATION HIGH POINT @ BREAKLINE
979.55 TC	SPOT ELEVATION TOP OF CURB/CONCRETE
979.55 GL	SPOT ELEVATION GUTTER LINE
979.55 CW	SPOT ELEVATION CONCRETE WALK
ME MATCH EXIST	EXISTING FIELD VERIFIED SPOT ELEVATION (AT GUTTER LINE ADD 6" FOR CURB ELEVATION)
979.55 FL	SPOT ELEVATION FLUSH AT GUTTER LINE
979.55 FF	FINISH FLOOR ELEVATION
979.55 CC	CURB CUT ELEVATION
979.55 TW	SPOT ELEVATION TOP OF WALL
979.55 BW	SPOT ELEVATION BOTTOM WALL AT GRADE
DI	DROP INLET SQUARE /RECTANGULAR OR ROUND DI/SD4.0
EDS DS	NEW OR EXISTING DOWNSPOUTS ARE SHOWN FOR REFERENCE ONLY REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION PROVIDE BOOTS PER(DS EDS/SD4.0)
CD	CANOPY DRAIN CD/SD4.0
ST	STORM SEWER ST/SD4.0
	EXISTING STORM SEWER
FD	4" DIA FOUNDATION DRAIN SMOOTH INTERIOR FD/SD4.0
UD	SUBSURFACE UNDER DRAIN W/FILTER FABRIC UD/SD4.1 REFER TO PLAN FOR SIZE
1.0 %	GRADE/SLOPE
	RUNOFF FLOW ARROW
	HANDICAPPED RAMP MAX SLOPE 8.33%
F.V.	FIELD VERIFY EXISTING CONDITIONS AND ADJUST ACCORDINGLY

GRADING AND DRAINAGE NOTES:

1. ALL EARTHWORK FOR THIS PROJECT SHALL BE UNCLASSIFIED EXCAVATION TO PLAN BOTTOM DEPTH. PLAN BOTTOM DEPTH IS DEFINED AS THE LOWEST ELEVATION OF EXCAVATION. THIS INCLUDES BOTTOM OF EXCAVATION FOR FOUNDATIONS, UTILITIES, ROADS. PARKING, SIDEWALKS, REQUIRED UNSUITABLE SOILS UNDERCUTTING , EXISTING FILL REMOVAL AND/OR ROCK REMOVAL AS INDICATED OR NOTED ON DRAWINGS OR GEOTECHNICAL REPORT.

2. AREAS THAT WILL SUPPORT FOUNDATIONS, FLOORS, PAVEMENTS, SHALL BE PROPERLY PREPARED AS SPECIFIED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL EXPLORATION REPORT PROVIDED BY VECTOR ENGINEERS, INC AND DATED DECEMBER 9, 2024 AND SHALL BE APPROVED BY ON-SITE THE GEOTECHNICAL ENGINEER/TESTING AGENCY.

3. PRIOR TO CONSTRUCTION OR THE PLACEMENT OF NEW ENGINEERED FILL, THE EXPOSED SUBGRADE SHALL BE EVALUATED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE EVALUATION SHALL INCLUDE PROOFROLLING OF THE EXPOSED SUBGRADE. IF UNSUITABLE MATERIALS AREA DISCOVERED, AN APPROPRIATE REMEDIAL MEASURE WOULD BE RECOMMENDED BY THE GEOTECHNICAL ENGINEER AT THAT TIME.

4. CARE MUST BE EXERCISED DURING GRADING AND FILL PLACEMENT OPERATIONS. THE COMBINATION OF CONSTRUCTION EQUIPMENT TRAFFIC AND EXCESS SURFACE MOISTURE CAN CAUSE PUMPING AND DETERIORATION OF THE NEAR SURFACE SOILS. THE SEVERITY OF THIS POTENTIAL PROBLEM DEPENDS TO A GREAT EXTENT ON THE WEATHER CONDITIONS PREVAILING DURING CONSTRUCTION. THE CONTRACTOR MUST EXERCISE DISCRETION WHEN SELECTING EQUIPMENT SIZES AND ALSO MAKE A CONCERTED EFFORT TO CONTROL SURFACE WATER WHILE THE SUBGRADE SOILS ARE EXPOSED. IF SUCH PROBLEMS DO ARISE, THE GEOTECHNICAL ENGINEER SHOULD BE CONTACTED TO EVALUATE THE CONDITION.

5. ENGINEERED FILL PLACEMENT AND COMPACTION OPERATIONS SHALL BE MONITORED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE. FIELD DENSITY TESTS MUST BE PERFORMED ON EACH LIFT AS NECESSARY TO CHECK THAT THE SPECIFIED COMPACTION IS BEING ACHIEVED

6. THE CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING STORM SEWER STRUCTURES, PIPES, AND ALL OTHER UTILITIES PRIOR TO CONSTRUCTION, AND SHALL CLOSELY MONITOR UTILITY INSTALLATION BY OTHERS. IT IS RECOMMENDED TO INSTALL GRAVITY STORM AND SANITARY LINES PRIOR TO ELECTRICAL, COMMUNICATION AND WATER LINES. BURY DEPTH CONFLICTS DUE TO NON COORDINATION WILL NOT SUBJECT TO CHANGE REQUEST.

7. EXCAVATION, ROCK REMOVAL, TOPSOIL STOCKPILES, DETENTION POND BERMS, UTILITY TRENCHES, AND OTHER ASPECTS OF CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE OSHA REGULATIONS 1926.650-652.

8. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT CIVIL ENGINEER OF ANY DISCREPANCIES FOUND BETWEEN THESE PLANS AND FIELD CONDITIONS PRIOR TO CONSTRUCTION.

9. THE PRINCIPLES OF POSITIVE DRAINAGE SHALL BE APPLIED UNIVERSALLY ACROSS THE SITE. WATER SHALL BE MOVED AWAY FROM THE BUILDINGS. WATER SHOULD NOT BE ALLOWED TO POND AT LOW POINTS OR IN LOW AREAS. FINISH SUBGRADE TO REQUIRED ELEVATION WITHIN THE FOLLOWING TOLERANCES:

LAWN OR UNPAVED AREAS: PLUS OR MINUS 0.1FT.
SIDEWALKS: PLUS OR MINUS 0.1FT.
PAVEMENT: PLUS OR MINUS 0.05FT.
GRADING INSIDE BUILDING LINE TO A TOLERANCE OF 0.05 FT WHEN TESTED WITH A 10 FOOT STRAIGHTEDGE

10. AFTER COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL PERFORM SITE CLEANUP TO REMOVE ALL TRASH, DEBRIS, EXCESS MATERIALS, EQUIPMENT, AND OTHER DELETERIOUS MATERIALS ASSOCIATED WITH CONSTRUCTION. THE SITE CONTRACTOR IS EXPRESSLY RESPONSIBLE FOR ENSURING THE SITE IS CLEAN AND IN OPERABLE CONDITION AT THE TIME OF FINAL ACCEPTANCE.

11. PROPOSED ROAD AND PARKING AREAS ARE NOT DESIGNED TO ACCOMMODATE HIGH LOADS CREATED BY CONSTRUCTION VEHICLES. CONTRACTOR SHALL MAINTAIN, STABILIZE AND REPAIR SUBGRADE/STONE BASE AND EXISTING ASPHALT PAVEMENT DAMAGED BY CONSTRUCTION TRAFFIC AS REQUIRED AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR IS RESPONSIBLE PROVIDE AND MAINTAIN TEMPORARY CONSTRUCTION ROAD IN ACCORDANCE WITH CONTRACTOR CONSTRUCTION METHOD AND SCHEDULE.

12. IF EXISTING FOUNDATION DRAINS EXIST AT EXISTING FOUNDATIONS. RECONNECT AND EXTEND EXISTING FOUNDATION DRAIN AS REQUIRED TO PROVIDE SUBSURFACE DRAINAGE.

13. ALL VALVE, METERS AND MANHOLE COVERS AT AREAS OF NEW WALK SHALL BE ADJUSTED TO MATCH THE PROPOSED GRADES AT AREAS OF NEW WORK. (TYP)

ACCESSIBILITY INFORMATION:

1. THE ELEVATION OF ALL EXTERIOR WALKS AND SLABS SHALL BE FLUSH WITH FINISH FLOOR ELEVATION AT ALL DOORS, AND SHALL SLOPE NO MORE THAN 2% WITHIN 5' OF THOSE DOORS. ELSEWHERE EXTERIOR WALKS AND SLABS SHALL CONFORM TO THE SPOT ELEVATIONS AND CONTOURS INDICATED AND IN NO CASE SHALL EXCEED 5% SLOPE EXCEPT AT CURBS RAMPS WHICH SHALL SLOPE 8.33% (MAX.). CROSS SLOPE OF WALKING SURFACES SHALL NOT BE STEEPER THAN 2.0%.

2. GRATING LOCATED WITHIN ROUTE SHALL BE POSITIONED PERPENDICULAR TO DIRECTION OF THE TRAVEL. SLOT WIDTH SHALL NOT EXCEED 1/2" UNLESS OTHERWISE NOTED.

3. PARKING SPACES AND ACCESS AISLES SHALL BE LEVEL WITH SURFACES SLOPES NOT EXCEEDING 2.0% (1:50)

4. TRANSITIONS FROM RAMPS TO WALKS, SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.

5. RAMPS TO BUILDING: WHERE INDICATED

a. MINIMUM WIDTH 48" SEE PLAN FOR ACTUAL DIMENSION.
b. SLOPE TO BE 1:12 MAXIMUM TO 1:20.
c. CROSS SLOPE 2% MAXIMUM.
d. FLARED SIDES: MAXIMUM SLOPE 1:10.

SITE UTILITIES NOTES: REFER TO M & E DRAWINGS FOR DEMOLITION AND INSTALLATION OF NEW UTILITIES. SANITARY AND WATER LINES ARE SHOWN FOR COORDINATION ONLY.

1. CONTRACTOR SHALL CALL KENTUCKY 811 AT LEAST 2 BUSINESS DAYS PRIOR TO ANY EXCAVATION, TO LOCATE AND MARK EXISTING UTILITIES.

2. EXISTING UTILITY LINES SHOWN ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LINE LOCATIONS PRIOR TO ANY CONSTRUCTION. ANY DEVIATIONS FROM THE DESIGN LOCATIONS SHALL BE REPORTED TO THE OWNER OR ENGINEER PRIOR TO BEGINNING CONSTRUCTION.

3. THE CONTRACTOR WILL PROVIDE ALL NECESSARY PROTECTIVE MEASURES TO SAFE GUARD UTILITIES FROM DAMAGE DURING CONSTRUCTION OF THIS PROJECT. IN THE EVENT THAT SPECIAL EQUIPMENT IS REQUIRED TO WORK OVER AND AROUND THE UTILITIES, THE SITE CONTRACTOR WILL BE REQUIRED TO FURNISH SUCH EQUIPMENT. IF SERVICE IS INTERRUPTED CONTRACTOR IS RESPONSIBLE FOR RESTORING SERVICE BY REPAIRING THE DAMAGED UTILITY AT NO ADDITIONAL COST TO THE OWNER.

4. THE CONTRACTOR SHALL NOTIFY EACH INDIVIDUAL UTILITY OWNER OF HIS PLAN OF OPERATION IN THE AREA OF THE UTILITIES PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL CONTACT THE UTILITY OWNERS AND REQUEST THEM TO PROPERLY LOCATE THEIR UTILITY ON THE GROUND. THIS NOTIFICATION SHALL BE GIVEN AT LEAST (3) BUSINESS DAYS PRIOR TO COMMENCEMENT OF OPERATIONS AROUND THE UTILITY.

5. ALL SANITARY AND STORM SEWERS SHOWN ARE EXISTING. LOCATIONS OF EXISTING SEWERS ARE APPROXIMATE AND ARE NOT KNOWN. CONTRACTOR SHALL PROBE TEST 8' PRIOR TO DRILLING OR TRENCHING.

FIELD QUALITY CONTROL:

OWNER WILL ENGAGE A QUALIFIED TESTING AGENCY TO PERFORM THE SPECIAL INSPECTION AND QUALITY ASSURANCE TESTING AS REQUIRED IN ACCORDANCE WITH THE LATEST EDITION OF KENTUCKY BUILDING CODE CHAPTER 17 AND EARTHWORK SPECIFICATION. CONTRACTOR IS RESPONSIBLE FOR QUALITY CONTROL SCHEDULING, PLANNING AND INSPECTION TO ENSURE PROPER TESTING BY OWNER'S TESTING AGENCY IN ACCORDANCE WITH GEOTECHNICAL RECOMMENDATIONS AND EARTHWORK SPECIFICATION.

UNSUITABLE SOILS ALLOWANCE BELOW PLAN BOTTOM DEPTH

INCLUDE AN ALLOWANCE BASED ON THE FOLLOWING WORK SCOPE: THE CONTRACTOR SHALL INCLUDE IN THE BASE BID, AN ALLOWANCE TO REMOVE AND DISPOSE OFF-SITE AN ADDITIONAL 100 CY OF UNSUITABLE SOIL, WHICH MAY BE ENCOUNTERED BELOW PLAN BOTTOM DEPTH. THE ALLOWANCE PRICE SHALL INCLUDE REPLACEMENT WITH 100 CY OF DGA PLACED AND COMPACTED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL REPORT AND ON-SITE TESTING AGENCY RECOMMENDATIONS. THE ALLOWANCE PRICE SHALL ALSO INCLUDE INSTALLATION OF 1500SF OF 6 OZ NON-WOVEN FILTER FABRIC. ACTUAL VOLUMES IN THE ALLOWANCE SHALL BE MEASURED BY THE ON-SITE TESTING AGENCY AND THE CONTRACT WILL BE ADJUSTED USING UNIT PRICES. THE ALLOWANCE SHALL BE INCLUDED IN THE BASE BID WITH A LINE ITEM SHOWN ON THE BID FORM.

SCALE: 1" = 10'-0" SCALE IN FEET
0 5 10 40

SHERMAN CARTER BARNHART ARCHITECTS

SPENCER COUNTY BOARD OFFICE RENOVATION, PROPERTY ACQUISITION, NEW PARKING LOT

TAYLORSVILLE, KENTUCKY

SITE GRADING AND DRAINAGE PLAN

JOB NO.	2448
DATE	02/26/2025
DRAWN	MB
CHECKED	D. DGLS.

REVISIONS

No.	Description	Date

SHEET
SD2.0

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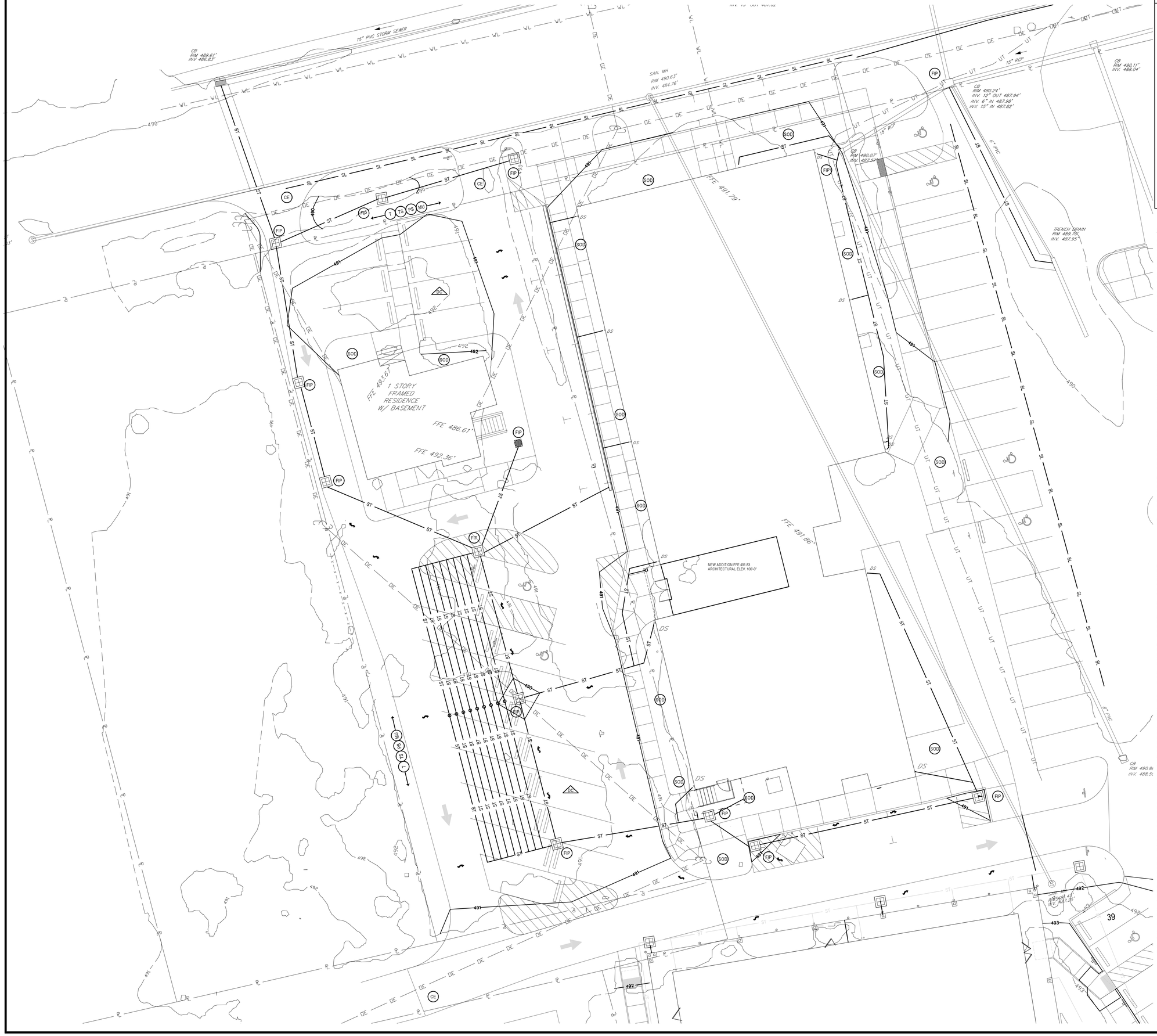

EROSION CONTROL LEGEND

SYMBOLS	DESCRIPTION
CE	TEMPORARY STONE CONSTRUCTION ENTRANCE CE/SD4.1
SL	SEDIMENT LOG SL/SD4.1
ECB	EROSION CONTROL BLANKETS SHORT-TERM DEGRADABLE BLANKET NORTH AMERICAN GREEN SC150BN OR EQ.
SLOPE STEEPER THAN 4:1	VELOCITY 8FPS & SHEAR STRESS 2.0 #/SQFT.
SLOPE STEEPER THAN 3:1	VELOCITY 10FPS & SHEAR STRESS 2.5 #/SQFT.
	REFER TO MANUFACTURE SPECIFICATIONS FOR INSTALLATION REQUIREMENTS
PS	PERMANENT SEEDING REFER TO LANDSCAPING SPECIFICATION FOR DETAILS
MU	MULCHING
TS	TEMPORARY SEEDING
T	TOPSOILING
GR	GRAVEL PAVEMENT REFER TO SD1.0
SOD	SOD ON MIN 6" TOPSOIL
FIP	FILTER FABRIC INLET PROTECTION FIP/SD4.1
DC	DUST CONTROL USE OF WATER SPRAY FOR DUST CONTROL DURING EARTH WORK AND DEMOLITION. DUST CONTROL WATER RUNOFF SHALL BE CONTAINED AND MANAGED PROPERLY TO PREVENT THE TRANSPORT OF CONTAMINANTS FROM SITE

EROSION SEDIMENT CONTROL NOTES

1. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF THE APPROPRIATE PERSONNEL NEEDED TO CREATE AND MAINTAIN SWPPP, A BEST MANAGEMENT PRACTICES (BMP) PLAN IN ACCORDANCE WITH, KYDES STORMWATER GENERAL PERMIT KYR10, AND "KENTUCKY EROSION PREVENTION AND SEDIMENT CONTROL FIELD GUIDE".

2. THE EROSION CONTROL MEASURES NOTED AND SHOWN ARE MINIMUMS AND DO NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY FOR COMPLIANCE WITH ANY AND ALL U.S. EPA AND / OR KENTUCKY DIVISION OF WATER REQUIREMENTS. CONTRACTOR IS RESPONSIBLE TO PROVIDE EROSION SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH CONTRACTOR CONSTRUCTION METHODS AND SCHEDULE. ANY ADDITIONAL ITEMS THAT ARE REQUIRED BY THE GOVERNING AUTHORITIES SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER WHETHER THEY APPEAR ON THIS PLAN OR NOT.

3. PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ALL REQUIRED PERMITS AND NOTIFYING THE KENTUCKY DIVISION OF WATER IN WRITING OF INTENT TO DISTURB. THE CONTRACTOR SHALL OBTAIN, SIGN AND SUBMIT THE NOTICE OF INTENT (NOI) TO THE KENTUCKY DIVISION OF WATER. A COPY OF THE SUBMITTAL AND PERMIT SHALL BE SENT TO THE OWNER AND THE ARCHITECT

4. ALL SILT FENCE SHALL BE INSTALLED PRIOR TO MOBILIZATION. SILT FENCES TO BE CLEANED OUT WHEN THEY BECOME ONE THIRD FULL OR AFTER EVERY RAIN IN EXCESS OF ONE HALF INCH.

5. THE CONTRACTOR SHALL HAVE QUALIFIED PERSONNEL INSPECT AND ENSURE THAT ROUTINE MAINTENANCE AND NONROUTINE REPAIR IS PERFORMED TO KEEP THE BMP IN GOOD WORKING ORDER. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED EVERY SEVEN (7) DAYS OR AFTER EACH RAINFALL OCCURRENCE THAT EXCEEDS ONE-HALF (1/2) INCH. IF SITE INSPECTIONS IDENTIFY BMPS THAT ARE DAMAGED OR ARE NOT OPERATING EFFECTIVELY, MAINTENANCE MUST BE PERFORMED AS SOON AS PRACTICAL OR AS REASONABLY POSSIBLE AND BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE. DAMAGED OR INEFFECTIVE DEVICES SHALL BE REPAIRED OR REPLACED, AS NECESSARY.

6. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. BARE SOIL AREAS MUST BE SEEDED, MULCHED OR COVERED AFTER 14 DAYS WHEN FINAL OR TEMPORARY GRADE IS ESTABLISHED IF NO WORK IS PLANNED IN THAT AREA DURING THE FOLLOWING 7 DAYS (I.E. 21 CONSECUTIVE DAYS). BUT IN NO CASE MORE THAN (21) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW.
WHERE STABILIZATION BY THE 21ST DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 21 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE. TEMPORARY SEEDING SHALL BE PROVIDED IN ACCORDANCE WITH "KENTUCKY EROSION PREVENTION AND SEDIMENT CONTROL FIELD GUIDE."

7. TOPSOIL STOCKPILES AND BORROW SITES SHALL BE SURROUNDED BY SILT FENCES AND RESEEDED.

8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR REMOVING DIRT AND CONSTRUCTION DEBRIS CAUSED BY CONSTRUCTION ACTIVITIES FROM THE ADJACENT ROADWAYS FOR THE DURATION OF THE PROJECT.

9. ALL POTENTIAL EROSION SHALL BE CONTROL IN SUCH MANNER SO AS TO PREVENT ANY DISPLACEMENT OF SILT TO THE ADJACENT PROPERTY OWNERS OR RIGTH-OF-WAY. THIS CONTROL SHALL BE IMPLEMENTED THROUGH PROPER INSTALLATION OF SILT FENCE DURING CONSTRUCTION AND MAINTAINED UNTIL PROPER GROUND COVER HAS BEEN ESTABLISHED.
IT IS THE CONTRACTOR'S RESPONSIBILITY TO PREVENT EROSION ONTO ADJACENT PROPERTY. ANY REMEDIAL MEASURES REQUIRED TO CORRECT DAMAGE CREATED BY EROSION SHALL BE AT THE CONTRACTOR'S EXPENSE.

10. THE EROSION CONTROL PLAN IS PREPARED AS GUIDE FOR INITIAL EROSION CONTROL MEASURES TO BE INSTALLED AT THE JOB SITE. IF EROSION OCCURS IN OTHER SPECIFIC AREAS OF THE PROPERTY DURING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING SILT FENCE, OR OTHER EROSION CONTROL MEASURES AS NEEDED TO PREVENT EROSION AND/OR CONTROL SEDIMENTATION.

11. CONTRACTOR IS SOLELY RESPONSIBLE FOR THE REMOVAL OF EROSION PREVENTION AND SEDIMENTATION CONTROL STRUCTURES AFTER CONSTRUCTION IS COMPLETE, BUT ONLY AFTER PROPER GROUND COVER HAS BEEN ESTABLISHED.

12. THE EROSION SEDIMENT CONTROL PLAN IS CONSIDERED A "LIVING DOCUMENT". THE SWPPP WILL BE REVISED FOR ANY OF THE FOLLOWING REASONS:

- WHEN THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, PROCEDURES, OR MAINTENANCE OF THE FACILITY THAT HAS A SIGNIFICANT EFFECT ON THE POTENTIAL TO CAUSE STORM WATER POLLUTION
- IF IT IS DISCOVERED THAT THE SWPPP FAILS TO PROTECT THE WATERS OF THE U.S. FROM POLLUTION
- IF AN EVALUATION OR INSPECTION RESULTS IN THE NEED FOR REVISION OF THE SWPPP

15. ANY ALTERATIONS OR REVISIONS TO THE BEST MANAGEMENT PRACTICES / EROSION CONTROL (BMP) PLAN BASED ON THE RESULTS OF THE INSPECTION SHALL BE IMPLEMENTED WITHIN SEVEN (7) DAYS. A REPORT SUMMARIZING THE SCOPE OF THE INSPECTION, NAMES AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTION, THE DATE OF THE INSPECTION, MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE BMP PLAN, AND ANY CORRECTIVE ACTIONS TAKEN SHALL BE MADE AND KEPT AS PART OF THE BMP PLAN FOR AT LEAST THREE (3) YEARS AFTER THE DATE OF INSPECTION, OR UNTIL ONE (1) YEAR AFTER COVERAGE UNDER THIS PERMIT ENDS. THE REPORT SHALL BE SIGNED IN ACCORDANCE WITH PART II OF THIS PERMIT.

16. A COPY OF THE APPROVED SWPPP, EROSION AND SEDIMENT CONTROL PLANS AND COPIES OF THE WEEKLY INSPECTION REPORT SHALL BE MAINTAINED ON THE SITE AT ALL TIMES IN THE JOB TRAILER.

17. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK.

18. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.

19. TEMPORARY DIVERSION BERMS AND/OR DITCHES SHALL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR TO DIVERT SEDIMENT-LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.

20. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS NEEDED BUT NOT LESS THAN DAILY.

21. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.

22. CONTAMINATED MATERIALS:
ALL PAINT, SOLVENT, PETROLEUM PRODUCTS (FUEL, LUBE OILS, GREASE AND CUTTING OILS) AND PETROLEUM WASTE PRODUCTS SHALL BE STORED IN CONTAINERS (SUCH AS DRUMS, CANS, OR CARTONS) SO THAT THESE MATERIALS ARE NOT EXPOSED TO STORM WATER. SUFFICIENT PRACTICES OF SPILL PREVENTION CONTROL, AND/OR MANAGEMENT SHALL BE PROVIDED TO PREVENT ANY SPILLS OF THESE POLLUTANTS FROM ENTERING A WATER OF THE STATE. ANY CONTAINMENT SYSTEM USED TO IMPLEMENT THIS REQUIREMENTS SHALL BE CONSTRUCTED OF MATERIALS COMPATIBLE WITH THE SUBSTANCES CONTAINED AND ALSO PREVENT CONTAMINATION OF GROUNDWATER.

A. CHEMICAL MANAGEMENT:
DO NOT STORE CHEMICALS, DRUMS AND BAGGED MATERIAL DIRECTLY ON THE GROUND. USE SECONDARY CONTAINMENT OR USE WOODEN PALLETS.
PROVIDE SPILL CONTAINMENT DIKES AROUND CHEMICAL AND FUEL STORAGE TANKS. LINE WITH PLASTIC FILM TO PREVENT SOIL CONTAMINATION.
STORE HAZARDOUS WASTES IN AN APPROPRIATE TYPE PF CONTAINER AND PROPERLY LABELED PER EPA, OSHA AND DOT REQUIREMENTS.

B. SOLID WASTE MANAGEMENT;
ONSITE TRASH SHOULD BE COLLECTED AND DISPOSED OF ON REGULAR BASIS. SANITARY SYSTEMS SHOULD BE REGULARLY SERVICED.
REPAIR TRASH CONTAINERS AND DUMPSTERS ON AS-NEEDED BASIS. WHERE POSSIBLE PROVIDE COVER FOR WASTE CONTAINERS TO PREVENT THE ENTRY OF RAINWATER AND LOSS OF CONTENTS BY WIND.
MAINTAIN A CONTINGENCY PLAN IN THE CASE THAT HAZARDOUS OR TOXIC MATERIALS ARE DISCOVERED.

C. EQUIPMENT MAINTENANCE;
MAINTAIN WASTE FLUID CONTAINERS IN LEAK PROOF CONDITION.
VEHICLES AND EQUIPMENT SHOULD BE INSPECTED ON EACH DAY OF USE. LEAKS SHOULD BE REPAIRED IMMEDIATELY OR THE PROBLEM VEHICLE(S) OR EQUIPMENT SHOULD BE REMOVED FROM THE PROJECT SITE.

D. DESIGNATED WASH DOWN AREAS, (BY GENERAL CONTRACTOR)
PERFORM WASHOUT OF CONCRETE IN DESIGNATED AREAS ONLY. PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MIL POLYETHYLENE SHEETING AND SHOULD FREE OF HOLES, TEARS OR OTHER DEFECTS. HARDENED CONCRETE SHOULD BE BROKEN UP, REMOVED AND DISPOSED OF IN ACCORDANCE WITH SOLID WASTE MANAGEMENT.
MONITOR ON SITE CONCRETE WASTE STORAGE AND DISPOSAL PROCEDURE AT LEAST WEEKLY.

E. SPILL CONTAINMENT PLAN
COMPLY WITH SUGGESTIONS AND REQUIREMENTS SET BY LOCAL FIRE DEPARTMENT. VERIFY WEEKLY THAT SPILL CONTROL CLEAN UP MATERIALS ARE LOCATED NEAR MATERIAL STORAGE, UNLOADING AND USE AREAS. RESTOCK APPROPRIATE CLEAN UP MATERIALS AFTER A SPILL INCIDENT HAS OCCURRED.

23. AFTER COMPLETION OF CONSTRUCTION, THE SITE CONTRACTOR SHALL PERFORM SITE CLEANUP TO REMOVE ALL TRASH, DEBRIS, EXCESS MATERIALS, EQUIPMENT, AND OTHER DELETERIOUS MATERIALS ASSOCIATED WITH CONSTRUCTION. THE SITE CONTRACTOR IS EXPRESSLY RESPONSIBLE FOR ENSURING THE SITE IS CLEAN AND IN OPERABLE CONDITION AT THE TIME OF FINAL ACCEPTANCE.

24. REMOVE TEMPORARY SEDIMENT CONTROL MEASURES WITHIN 30 DAYS AFTER FINAL STABILIZATION IS ACHEVED AND TEMPORARY BEST MANAGEMENT PRACTICES (BMPS) ARE NO LONGER NEEDED.

25. ALL SLOPES 4:1 AND STEEPER THAN 4:1 SHALL REQUIRE EROSION CONTROL BLANKET S150 NORTH AMERICAN GREEN OR EQ. REFER TO MANUFACTURE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

SCALE: 1" = 10'-0"

SCALE IN FEET

0 5 10 40

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Last Saved by: mbankhead
Sheet Layout: SD2.1

SHERMAN CARTER BARNHART ARCHITECTS

COMMONWEALTH OF KENTUCKY · MICHAEL G. BANKHEAD · 19510 · LICENSED PROFESSIONAL ENGINEER

SPENCER COUNTY BOARD OFFICE RENOVATION, PROPERTY ACQUISITION, NEW PARKING LOT

TAYLORSVILLE, KENTUCKY

EROSION AND SEDIMENT CONTROL PLAN

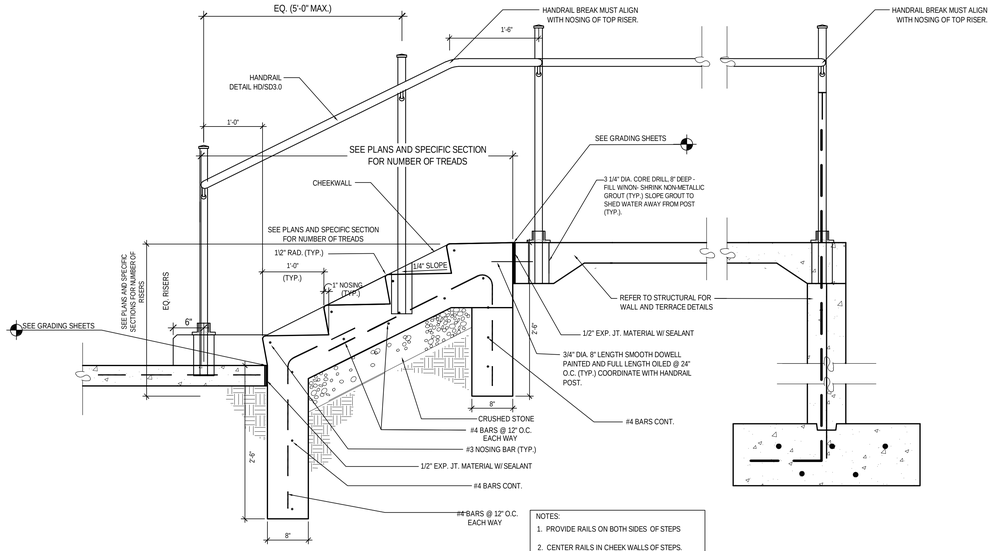
JOB NO.	2448
DATE	02/26/2025
DRAWN	MB
CHECKED	D. DGLS.

REVISIONS

No.	Description	Date

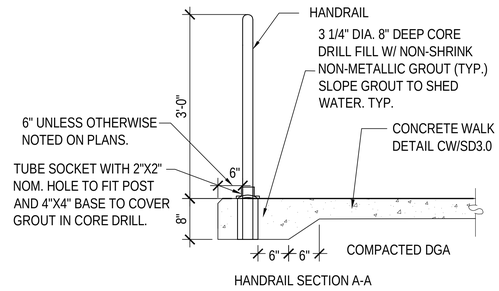
SHEET

SD2.1



NOTES:
1. PROVIDE RAILS ON BOTH SIDES OF STEPS
2. CENTER RAILS IN CHEEK WALLS OF STEPS.
3. STEPS SHALL HAVE EQUAL RISERS (5" MIN. AND 7" MAX.). REFER TO GRADING PLAN FOR TOP AND BOTTOM ELEVATIONS.

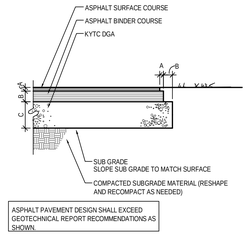
CONCRETE STEP DETAIL — CS
1" = 1'-0"



HANDRAIL SECTION A-A

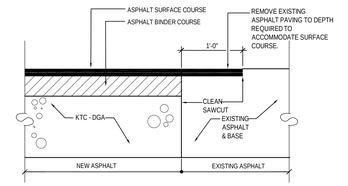
HANDRAIL — HR
1" = 1'-0"

DIM.	LIGHT DUTY	HEAVY DUTY	ASPHALT OVERLAY
A	1-1/4"	1-1/2"	1 1/2"
B	2"	2-1/2"	EXISTING
C	8"	8"	EXISTING



ASPHALT PAVEMENT DESIGN SHALL EXCEED GEOTECHNICAL REPORT RECOMMENDATIONS AS SHOWN.

ASPHALT PAVEMENT DETAIL — AP
N.T.S.



EDGE KEY — EK
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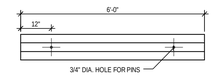
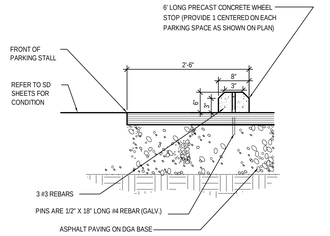
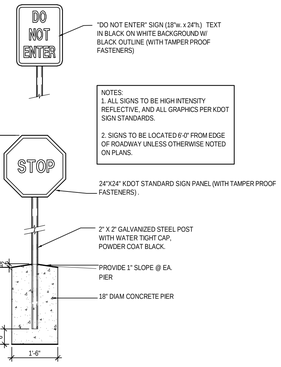


PLAN

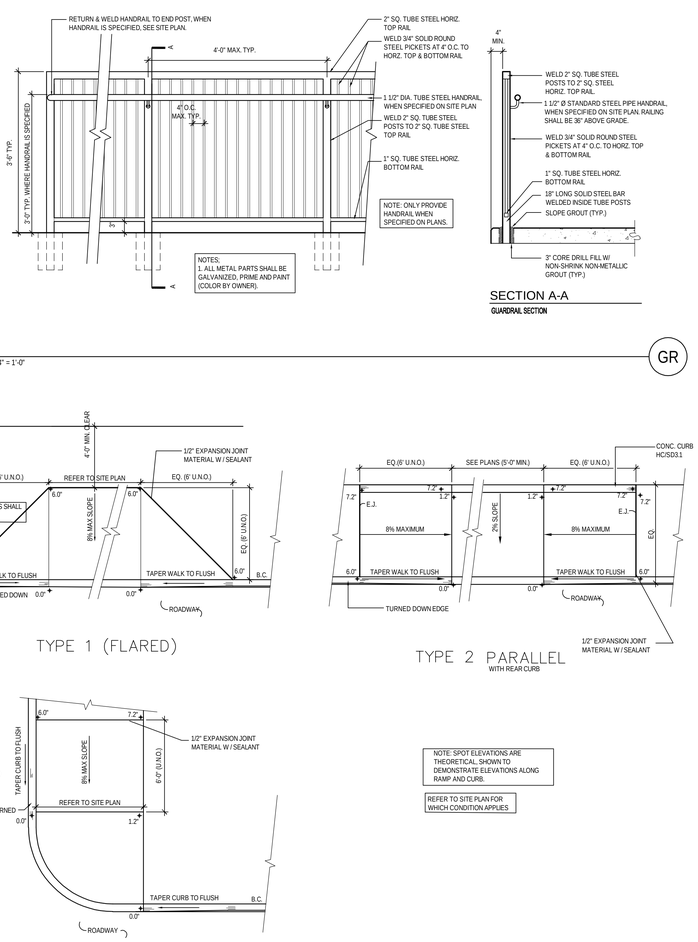


SECTION

WHEEL STOP — WS
N.T.S.



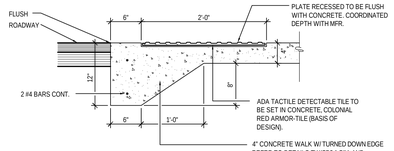
STOP SIGN DETAIL — SS
1/2" = 1'-0"



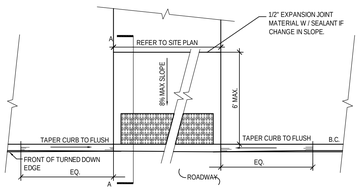
SECTION A-A
GUARDRAIL SECTION

GUARDRAIL — GR
3/4" = 1'-0"

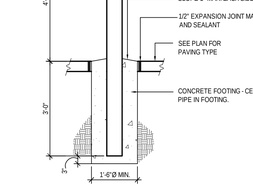
NOTES:
1. MAINTAIN 6" MIN. CONCRETE EDGE ON ALL SIDES OF TILES UNLESS OTHERWISE SHOWN ON PLANS.
2. TILES SHALL BE INSTALLED SQUARE TO EACH OTHER WITH NO GAPS. IN RADIUS CONDITIONS, TILES SHALL BE CUT TO FIT RADIUS.
3. REFER TO PLAN FOR LOCATIONS AND CONDITION OF TACTILE SURFACE.
4. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION.
5. KEEP WET CONCRETE OFF THE TOP SURFACE OF THE PLATES AT ALL TIMES.
6. COLOR TO BE COLONIAL RED.
7. TILES SHALL MEET ADA AND STATE REQUIREMENTS.



SECTION VIEW A-A

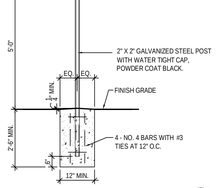


ADA TACTILE DETECTABLE WARNING SURFACE — TS
1/4" = 1'-0"

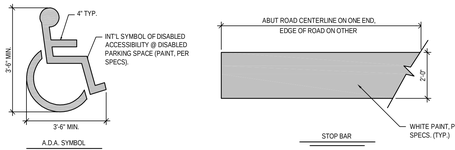


PIPE BOLLARD — BD
N.T.S.

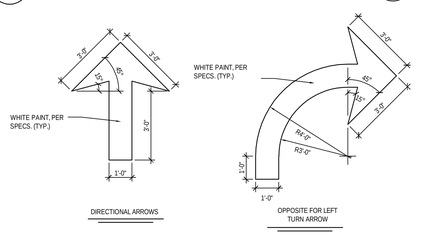
SIGN POST SHALL BE 2'-0" FROM FRONT EDGE OF PARKING SPACE UNLESS OTHERWISE SHOWN ON PLAN.



ACCESSIBLE PARKING SIGNAGE — AS
N.T.S.

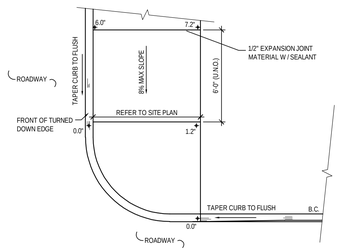


PAVEMENT APPLIED GRAPHICS — PG
3/8" = 1'-0"



TYPE 1 (FLARED)

TYPE 2 PARALLEL
WITH REAR CURB

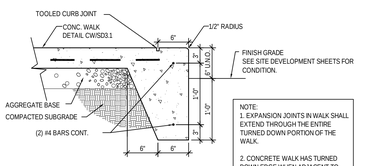


TYPE 3 (PERPENDICULAR)

NOTE: SPOT ELEVATIONS ARE THEORETICAL, SHOWN TO DEMONSTRATE ELEVATIONS ALONG RAMP AND CURB.

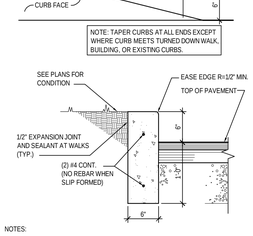
REFER TO SITE PLAN FOR WHICH CONDITION APPLIES

CURB RAMP DETAIL — CR
N.T.S.

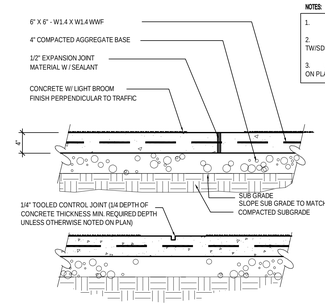


NOTE:
1. EXPANSION JOINTS IN WALK SHALL EXTEND THROUGH THE ENTIRE TURNED DOWN PORTION OF THE WALK.
2. CONCRETE WALK HAS TURNED DOWN EDGE WHEN ADJACENT TO PAVEMENT. U.N.O.

CONCRETE WALK WITH TURNED DOWN EDGE — TW
1" = 1'-0"

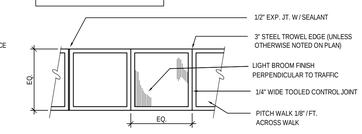


HEADER CURB — HC
1" = 1'-0"



NOTES:
1. SEE PLAN FOR CONTROL JOINTS
2. TURN DOWN WALK EDGE WHERE WALK MEETS PAVEMENT (REFER TO DETAIL TW/SD3.1)
3. U.N.O. EXPANSION JOINTS SHALL BE SPACED 50' MAX. O.C. AND WHERE SHOWN ON PLAN. CONTROL JOINTS SHALL BE PLACED 8' MAX. O.C.

CONTRACTOR TO PROVIDE SMOOTH TROWLED CUSTOM 3" BORDER FOR CONCRETE PATTERN. (WIDTH OF BORDER SHALL BE EQUAL AT EDGES AND TOOLED JOINTS. USE CUSTOM FINISHING TOOLS AS REQUIRED.)



CONCRETE WALK — CW
N.T.S.

SHERMAN CARTER BARNHART ARCHITECTS

STATE OF KENTUCKY
DAVID MICHAEL DIAZ 1021
REGISTERED LANDSCAPE ARCHITECT

SPENCER COUNTY BOARD OFFICE RENOVATION, PROPERTY ACQUISITION, NEW PARKING LOT

TAYLORSVILLE, KENTUCKY

SITE DETAILS

JOB NO.	2448
DATE	02/26/2025
DRAWN	DMD
CHECKED	D. DGLS.

REVISIONS

No.	Description	Date
1		

SHEET

SD3.0

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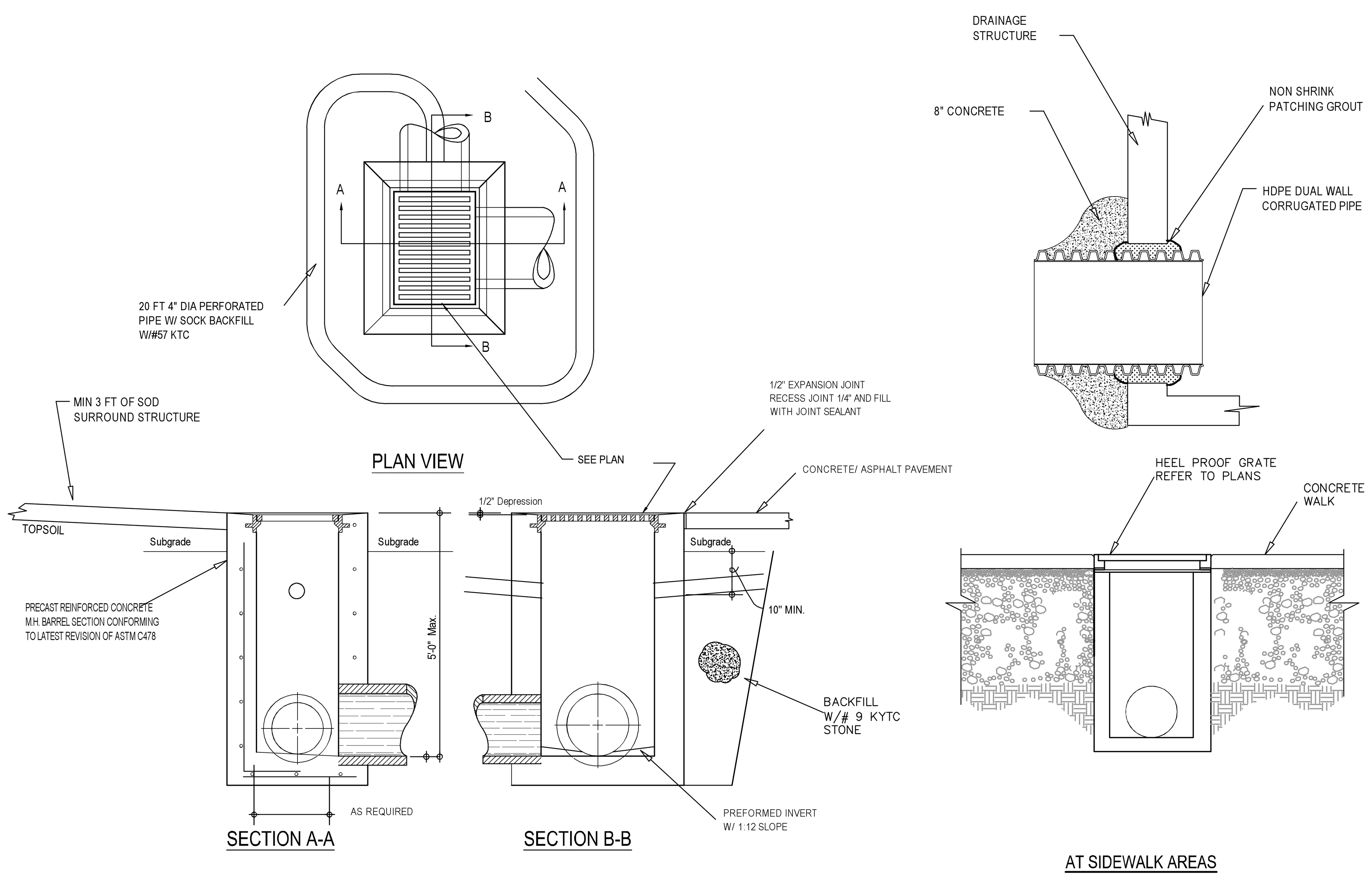
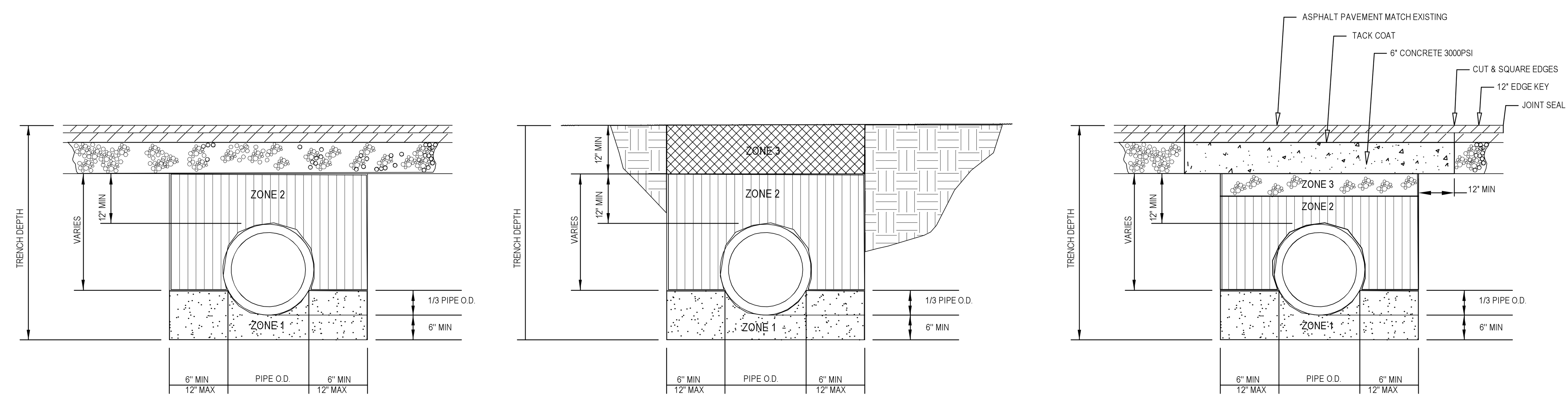


DROP INLET

N.T.S. DIMENSIONS AND REINFORCEMENT DESIGN BY PRECAST MANUFACTURER

DI



ZONE 2 - COMPACTED KTC NO. 9 STONE (FOR PIPING UNDER AND WITHIN 3' OF PAVED AREAS.)

ZONE 1 - PIPE BEDDING MATERIAL, KTC NO. 9 STONE

ZONE 3 - COMPACTED SOIL BACKFILL (COMPACT SOIL IN 6" LIFTS)

ZONE 2 - COMPACTED SELECT MATERIAL KTC #9 OR EQ.

ZONE 1 - PIPE BEDDING MATERIAL, KTC NO. 9 STONE

ZONE 3 - 6" MIN COMPACTED DGA

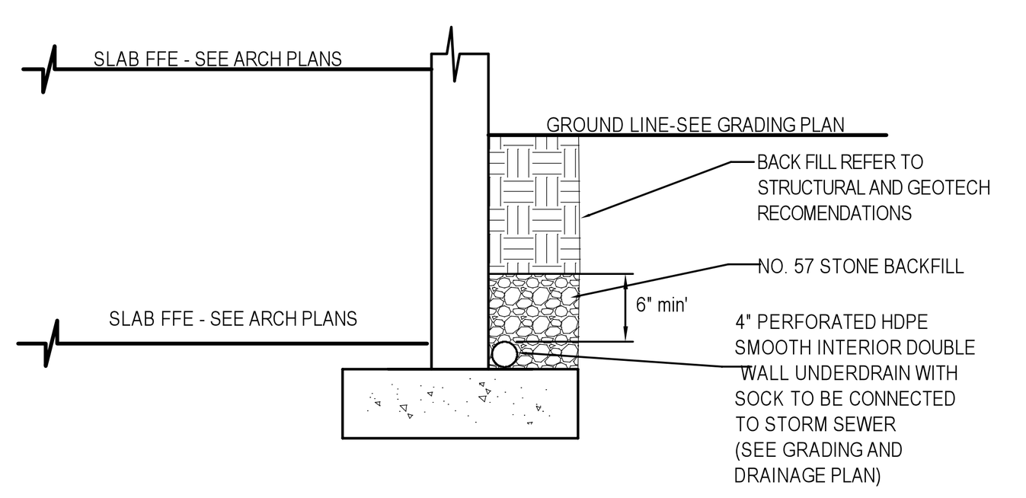
ZONE 2 - COMPACTED KTC NO. 9 STONE (FOR PIPING UNDER AND WITHIN 3' OF PAVED AREAS.)

ZONE 1 - PIPE BEDDING MATERIAL, KTC NO. 9 STONE

FOR EXTERIOR STORM PIPING ONLY

PIPE BEDDING DETAILS

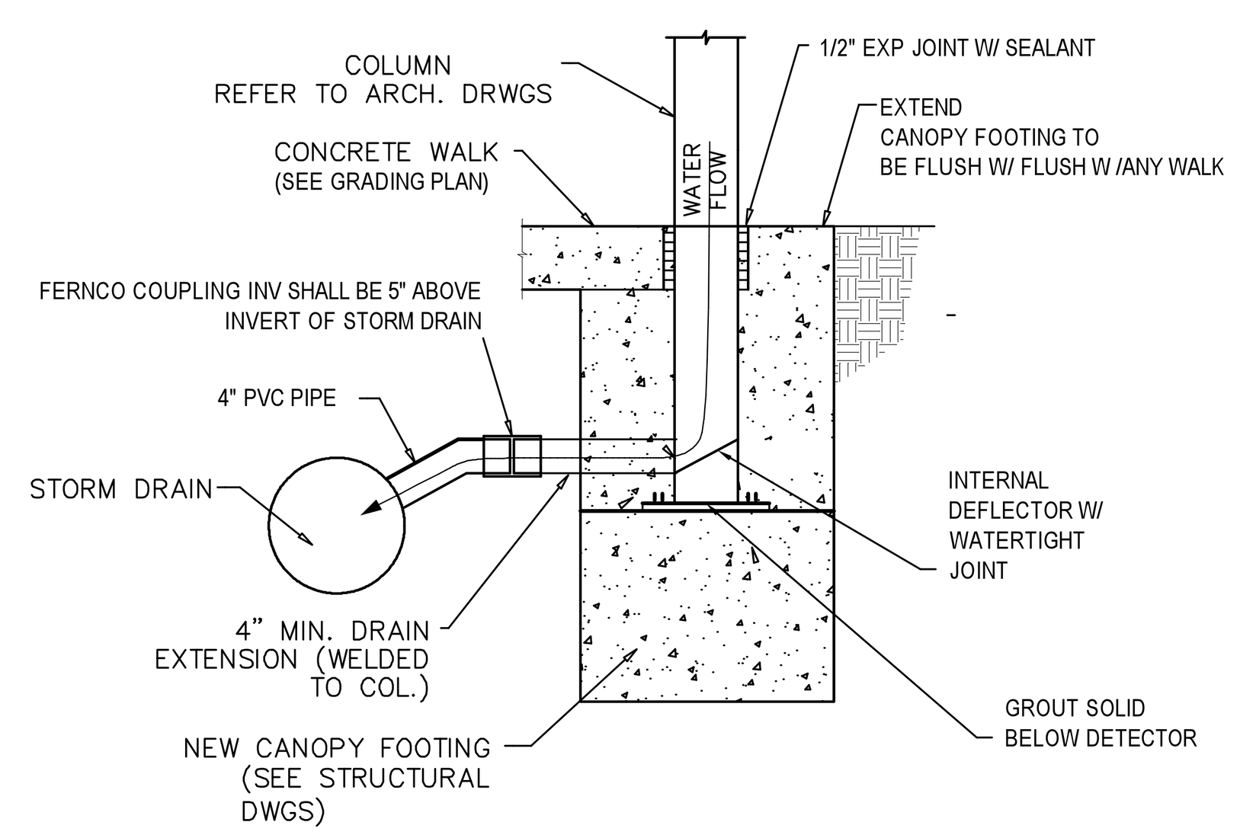
ST



FOUNDATION DRAIN DETAIL

N.T.S.

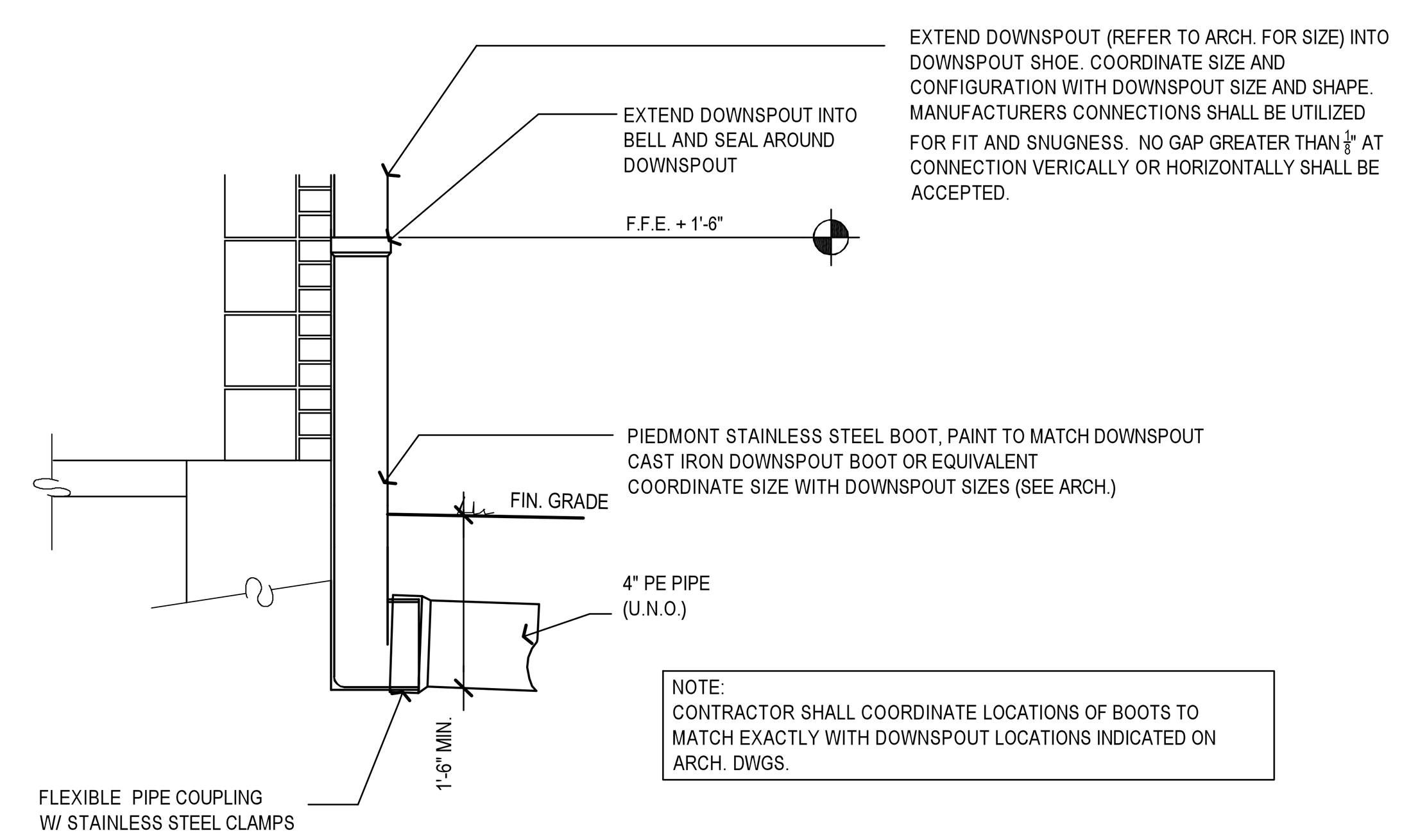
FD



CANOPY DRAIN CONNECTION DETAIL

N.T.S

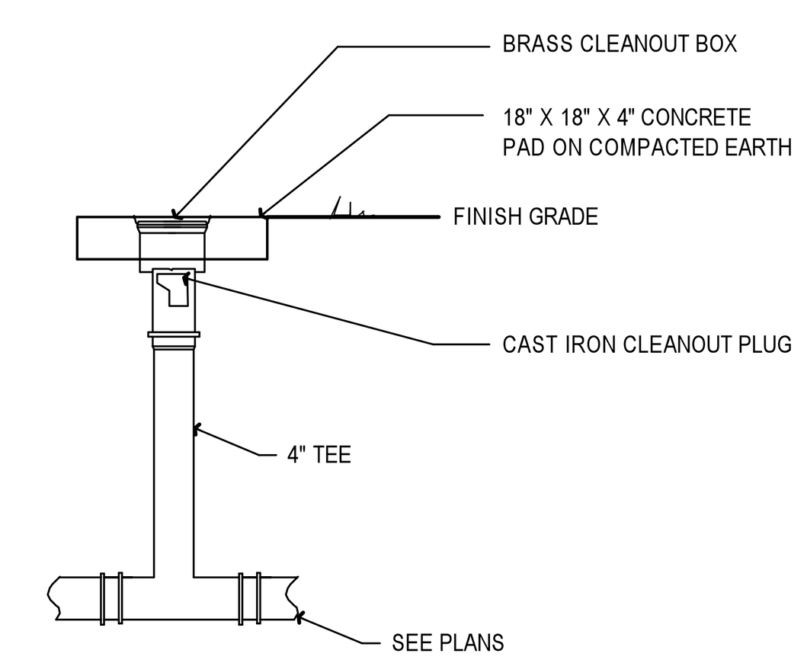
CD



DOWNSPOUT CONNECTION DETAIL

N.T.S.

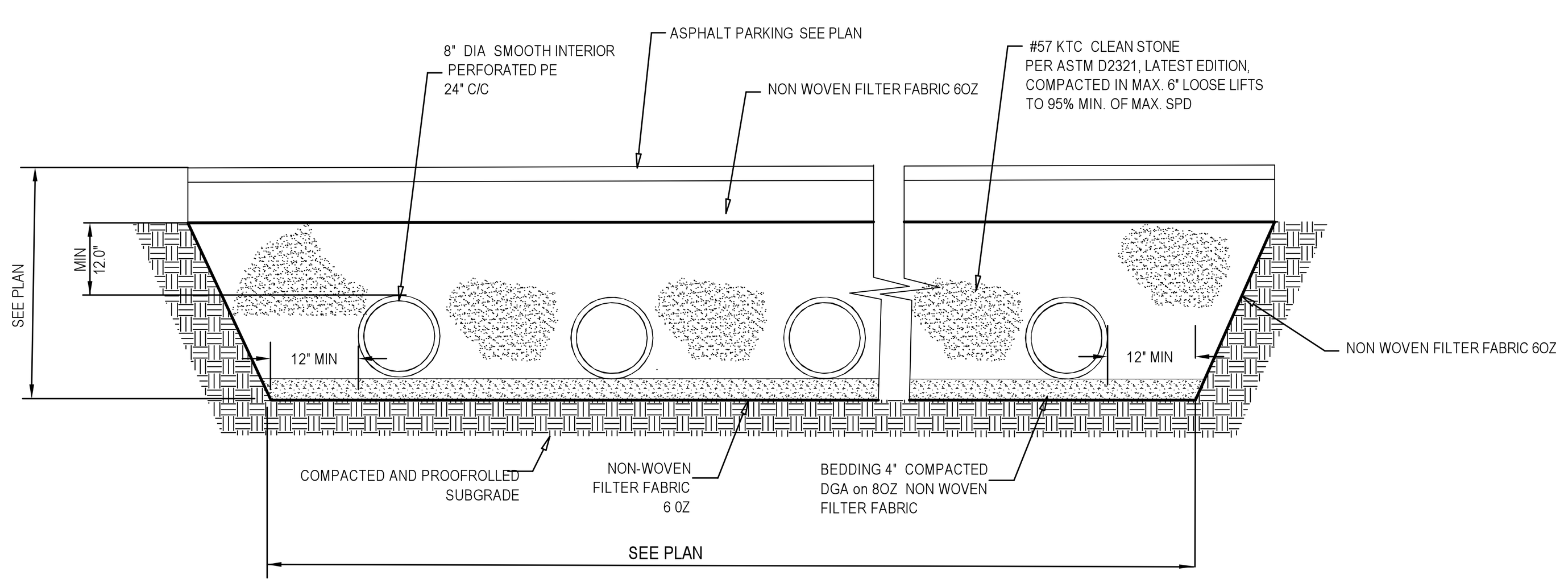
DS EDS



EXTERIOR CLEANOUT DETAIL

N.T.S.

CO



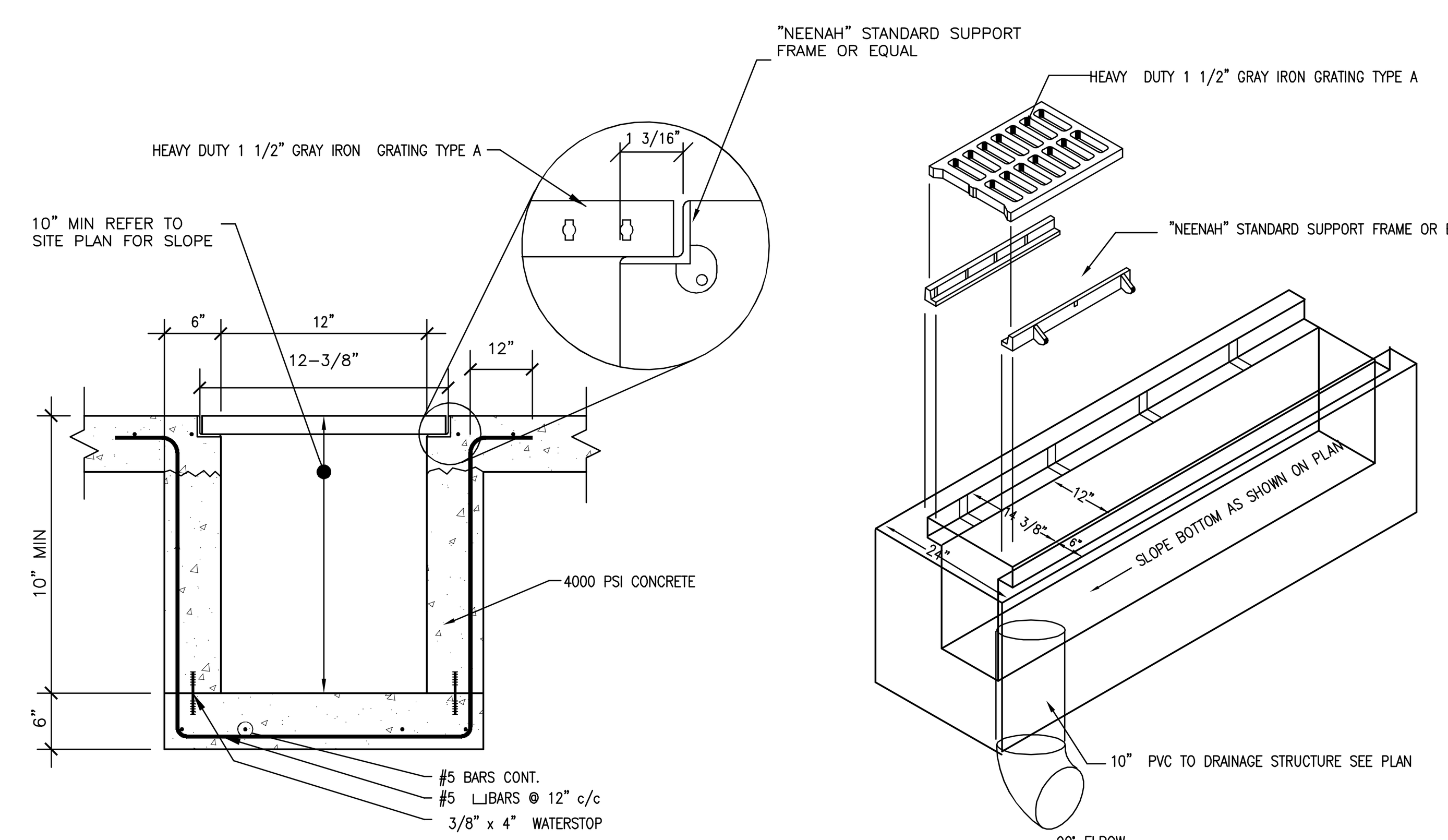
1. ALL RETENTION AND DETENTION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.

2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE SOIL FINES INTO BACKFILL MATERIALS

UNDERGROUND DETENTION

N.T.S.

UD



TRENCH DRAIN

N.T.S.

TR

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Login Name: mbashkhes
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SHERMAN CARTER BARNHART ARCHITECTS

STATE OF KENTUCKY MICHAEL D. HASHKHES 19810 LICENSED PROFESSIONAL ENGINEER

SPENCER COUNTY BOARD OFFICE RENOVATION, PROPERTY ACQUISITION, NEW PARKING LOT

TAYLORSVILLE, KENTUCKY

SITE DETAILS

JOB NO.	2448
DATE	02/26/2025
DRAWN	MB
CHECKED	D. DGLS.

REVISIONS

No.	Description	Date

SHEET

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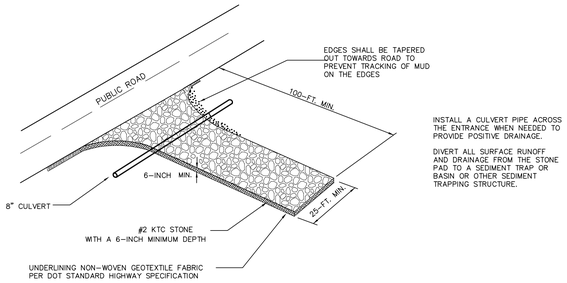


INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.

DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN OR OTHER SEDIMENT TRAPPING STRUCTURE.

STABILIZED CONSTRUCTION ENTRANCE

WHEN AND WHERE TO USE IT

STABILIZED CONSTRUCTION ENTRANCES SHOULD BE USED AT ALL POINTS WHERE TRAFFIC WILL BE LEAVING A CONSTRUCTION SITE AND MOVING DIRECTLY ONTO A PUBLIC ROAD.

IMPORTANT CONSIDERATIONS

IF WASHING IS USED, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFFSITE. WASHDOWN FACILITIES SHALL BE REQUIRED AS DIRECTED BY INSPECTOR AS NEEDED. WASHDOWN AREAS IN GENERAL MUST BE ESTABLISHED WITH CRUSHED GRAVEL AND DRAIN INTO A SEDIMENT TRAP OR SEDIMENT BASIN. CONSTRUCTION ENTRANCES SHOULD BE USED IN CONJUNCTION WITH THE STABILIZATION OF CONSTRUCTION ROADS TO REDUCE THE AMOUNT OF MUD PICKED UP BY VEHICLES.

UINSTALLATION:

REMOVE ALL VEGETATION AND ANY OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA.

DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM STONES TO A SEDIMENT TRAP OR BASIN.

INSTALL A NON-WOVEN GEOTEXTILE FABRIC PRIOR TO PLACING ANY STONE. INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.

THE ENTRANCE SHALL CONSIST OF #2 KTC STONE PLACED AT A MINIMUM DEPTH OF 6-INCHES. MINIMUM DIMENSIONS OF THE ENTRANCE SHALL BE 24-FEET WIDE BY 100-FEET LONG, AND MAY BE MODIFIED AS NECESSARY TO ACCOMMODATE SITE CONSTRAINTS.

THE EDGES OF THE ENTRANCE SHALL BE TAPERED OUT TOWARDS THE ROAD TO PREVENT TRACKING OF MUD AT THE EDGE OF THE ENTRANCE.

INSPECTION AND MAINTENANCE:

INSPECT CONSTRUCTION ENTRANCES EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES ½-INCHES OR MORE OF PRECIPITATION, OR AFTER HEAVY USE. CHECK FOR MUD AND SEDIMENT BUILDUP AND PAD INTEGRITY. MAKE DAILY INSPECTIONS DURING PERIODS OF WET WEATHER. MAINTENANCE IS REQUIRED MORE FREQUENTLY IN WET WEATHER CONDITIONS. RESHAPE THE STONE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.

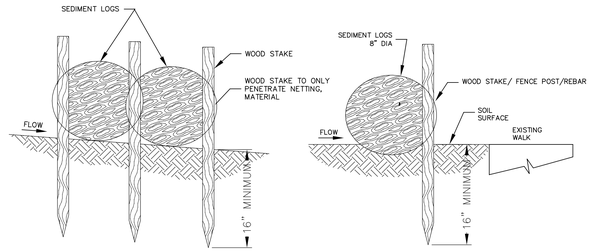
WASH OR REPLACE STONES AS NEEDED AND AS DIRECTED BY THE INSPECTOR. THE STONE IN THE ENTRANCE SHOULD BE WASHED OR REPLACED WHENEVER THE ENTRANCE FAILS TO REDUCE MUD BEING CARRIED OFF-SITE BY VEHICLES. FREQUENT WASHING WILL EXTEND THE USEFUL LIFE OF STONE.

IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. FLUSHING SHOULD ONLY BE USED WHEN THE WATER CAN BE DISCHARGED TO A SEDIMENT TRAP OR BASIN.

REPAIR ANY BROKEN PAVEMENT IMMEDIATELY.

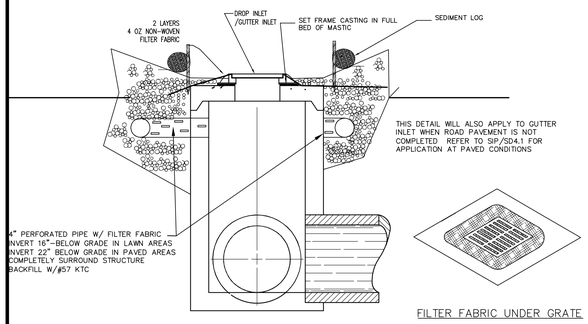
CONSTRUCTION ENTRANCE
N.T.S.

CE



STRAW ROLL SEDIMENT LOGS
N.T.S. DIMENSIONS AND REINFORCEMENT DESIGN BY PRECAST MANUFACTURER

SL



FILTER FABRIC UNDER GRATE

FILTER FABRIC INLET PROTECTION

USE FILTER FABRIC THAT CONFORMS TO DOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (LATEST EDITION).

INSTALLATION:

EXCAVATE A TRENCH 6-INCHES WIDE AND 6-INCHES DEEP AROUND THE OUTSIDE PERIMETER OF THE INLET UNLESS THE FABRIC IS PNEUMATICALLY INSTALLED.

INSTALL THE FILTER FABRIC TO A MINIMUM HEIGHT OF 24-INCHES ABOVE GRADE. SPACE THE POSTS AROUND THE PERIMETER OF THE INLET A MAXIMUM OF 3-FEET APART AND DRIVE THEM INTO THE GROUND A MINIMUM OF 24-INCHES.

CUT THE FILTER FABRIC FROM A CONTINUOUS ROLL TO THE LENGTH OF THE PROTECTED AREA TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY, WRAP FILTER FABRIC TOGETHER ONLY AT A SUPPORT POST WITH BOTH ENDS SECURELY FASTENED TO THE POST, WITH A MINIMUM 6-INCH OVERLAP.

EXTEND THE FILTER FABRIC A MINIMUM OF 12-INCHES INTO THE TRENCH. BACKFILL THE TRENCH WITH SOIL OR CRUSHED STONE AND COMPACT OVER THE FILTER FABRIC UNLESS THE FABRIC IS PNEUMATICALLY INSTALLED.

ATTACH FABRIC TO STEEL POSTS WITH HEAVY-DUTY PLASTIC TIES. ATTACH AT LEAST FOUR (4) EVENLY SPACED TIES IN A MANNER TO PREVENT SAGGING OR TEARING OF THE FABRIC. IN ALL CASES, AFFIX TIES IN NO LESS THAN FOUR (4) PLACES.

INSPECTION AND MAINTENANCE:

INSPECTIONS SHOULD BE MADE EVERY 7 CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH STORM THAT PRODUCES ½-INCHES OR MORE OF RAIN. IF THE FABRIC BECOMES CLOGGED, IT SHOULD BE REPLACED. SEDIMENT SHOULD BE REMOVED WHEN IT REACHES APPROXIMATELY 1/3 THE HEIGHT OF THE FENCE.

TAKE CARE NOT TO DAMAGE OR UNDERCUT FABRIC WHEN REMOVING SEDIMENT. IF A SUMP IS USED, SEDIMENT SHOULD BE REMOVED WHEN IT FILLS APPROXIMATELY 1/3 THE DEPTH OF THE HOLE.MAINTAIN THE POOL AREA, ALWAYS PROVIDING ADEQUATE SEDIMENT STORAGE VOLUME FOR THE NEXT STORM.

STORM DRAIN INLET PROTECTION STRUCTURES SHOULD BE REMOVED ONLY AFTER THE DISTURBED AREAS ARE PERMANENTLY STABILIZED. REMOVE ALL CONSTRUCTION MATERIAL AND SEDIMENT, AND DISPOSE OF THEM PROPERLY. GRADE THE DISTURBED AREA TO THE ELEVATION OF THE DROP INLET STRUCTURE CREST. USE APPROPRIATE PERMANENT STABILIZATION METHODS TO STABILIZE BARE AREAS AROUND THE INLET.

FABRIC INLET PROTECTION
N.T.S.

FIP

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Day & Time: Feb 28, 2025 - 8:46am
Login Name: mbaldwin
Sheet Layout: SD4.1

SHERMAN CARTER BARNHART ARCHITECTS

COMMONWEALTH OF KENTUCKY * LICENSED * MICHAEL G. BALDWIN 19410 LICENSED PROFESSIONAL ENGINEER

SPENCER COUNTY BOARD OFFICE
RENOVATION, PROPERTY ACQUISITION,
NEW PARKING LOT

TAYLORSVILLE, KENTUCKY

SITE DETAILS

JOB NO.	2448
DATE	02/26/2025
DRAWN	MB
CHECKED	D. DGLS.

REVISIONS

No.	Description	Date

SHEET

SD4.1

STRUCTURAL QUALITY ASSURANCE PLAN

GENERAL

THE NEW STRUCTURE TO BE CONSTRUCTED IS ASSIGNED BY THE KENTUCKY BUILDING CODE, 2018 EDITION, TO SEISMIC USE GROUP AND SEISMIC DESIGN AS SPECIFIED. AS SUCH, THE BUILDING CODE MANDATES SPECIAL INSPECTION (SECTION 1704), SPECIAL INSPECTIONS FOR WIND RESISTANCE (SECTION 1705.11), SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE (SECTION 1705.12). STRUCTURAL OBSERVATION FOR SEISMIC RESISTANCE (SECTION 1704.6.1) AND STRUCTURAL OBSERVATIONS FOR WIND REQUIREMENTS (SECTION 1704.6.2). STRUCTURAL QUALITY ASSURANCE PLAN SPECIFICALLY IDENTIFIES THE RESPONSIBILITIES OF THE CONTRACTOR AND THE SPECIAL INSPECTOR IN PERFORMING THE REQUIRED TESTING AND INSPECTION OF THE STRUCTURAL WORK.

CONTRACTOR RESPONSIBILITIES

In accordance with Section 1704.4 of the Building Code, the Contractor shall submit to the Building Official and the Architect a written statement of responsibility that contains the following:

1) Acknowledgement of awareness of the special requirements contained within this Structural Quality Assurance Plan.

2) Acknowledgement that control shall be exercised to obtain conformance with the construction documents approved by the Building Official.

3) Procedures for exercising control with the Contractor's organization, the method and frequency of reporting, and the distribution of reports.

4) Identification and qualifications of the person(s) exercising such control and their position(s) in the organization.

The Structural Testing / Inspection Agency that is to act as the Special Inspector will be hired by the Owner.

Contractor shall pay for any additional structural testing/inspection required for work or materials not complying with the Construction Documents due to negligence or nonconformance and shall pay for any additional structural testing/inspection required for his convenience.

The Contractor is responsible to ensure that the Special Inspector is present for all work requiring special inspection. Any work that requires special inspection and is performed without the Special Inspector being present is subject to being demolished and reconstructed.

The Contractor has the following responsibilities to the Special Inspector:

1) Provide copy of Construction Documents to the Special Inspector.

2) Notify the Special Inspector sufficiently in advance of operations to allow assignment of personnel and scheduling of tests.

3) Cooperate with Special Inspector and provide access to work.

4) Provide samples of materials to be tested in required quantities.

5) Provide storage space for the Special Inspector's exclusive use, such as for storing and curing concrete testing samples.

6) Provide labor to assist the Special Inspector in performing tests/inspections.

SOILS

The Special Inspector shall perform the following:

1) Verify structural fill complies with specifications and the geotechnical report

2) Observer proofrolling.

3) Perform field density tests to verify compaction of structural fill. As a minimum, perform one test per lift for every 2500 square feet of fill placed.

LIGHT-GAGE METAL FRAMING

The Contractor shall perform the following:

1) Trusses shall be manufactured and designed in accordance with the North American specifications for the design of cold-formed steel structural members AISI S100. Submit letter of compliance and calculations.
2) Submit shop drawings signed and sealed by KY P.E.

The Special Inspector shall perform periodic inspections of the following:

1) Visual inspection of ALL bearings and connections.
2) Verify installation of bridging or braces.
3) Verify connection for top and bottom chords.
4) Verify reinforcement of members for concentrated loads.
5) Verify proper bearing.
6) Check all framing layout and confirm compliance with plans, specs, and shop drawings.
7) Visually inspect truss layout and anchorage and confirm compliance with plans, specs, and shop drawings.
8) Visually inspect all roof and wall sheathing attachments and confirm compliance with plans, specs, and shop drawings.

CAST-IN-PLACE CONCRETE

The Contractor shall perform the following:

1. Establish concrete mix design proportions per ACI 318, Chapter 5. Submit 5 copies (minimum) of the concrete mix designs. Include the following:

a. Type and quantities of materials
b. Slump
c. Air content
d. Fresh unit weight
e. Aggregates sieve analysis
f. Design compressive strength
g. Location of placement in structure
h. Method of placement
i. Method of curing
j. Seven-day and 28-day compressive strengths

2. Submit a certification from each manufacturer or supplier stating that materials meet the requirements of the specified ASTM and ACI standards.

3. Submit certification that the ready-mixed concrete plant complies with the requirements of the National Ready Mix Concrete Association.

The Special Inspector shall perform the following:

1. Verify quantity, location, and placement of reinforcing steel prior to concrete placement.

2. Examine concrete in truck to verify that concrete appears properly mixed.

3. Perform a slump test as deemed necessary for each concrete load. Record if water or admixtures are added to the concrete at the job site. Perform additional slump tests after job site adjustments.

4. Mold four specimens per set for compressive strength testing; one set for each 50 cubic yards (or portion thereof) of each mix design in any one day. For each set set molded, record:

a. Slump
b. Air content
c. Unit weight
d. Temperature, ambient and concrete
e. Location of placement
f. Any pertinent information, such as addition of water, addition of admixtures, etc.

5. Perform one 7-day and two 28-day compressive strength tests. (Use one as a spare to be broken as directed by the Structural Engineer if compressive strengths do not appear adequate.)

6. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, concrete design compressive strength, location of concrete placement in structure, concrete mix proportions and materials, compressive breaking strength and type of break.

NON-SHRINK GROUT UNDER STEEL BASE PLATES

The Special Inspector shall perform the following:

1. Compressive strength tests per ASTM C109.

2. Number of Tests: One test for each ten bags of grout used or minimum of one test for each day of grouting.

3. Cube Size: 2-inch x 2-inch.

4. Test Schedule: One cube at 3 days, two cubes at 7 days, three cubes at 28 days.

CONCRETE MASONRY

Contractor shall perform the following:

1. Submit a certification from each manufacturer or supplier stating that the following materials comply with the specified ASTM or ACI Standards:

a. Concrete masonry units.
b. Mortar materials: Portland cement, hydrated lime, and aggregates.
c. Grout materials: Portland cement and aggregates.
d. Joint reinforcement steel.
e. Reinforcing steel.

2. For reinforcing steel used in concrete masonry walls, submit certified mill test reports.

Special Inspector shall perform the following:

1. Verify compressive strength of concrete masonry units, mortar, and coarse grout for every 5,000 sq. ft. of surface area (or portion thereof) as follows:

a. Three (3) concrete masonry units shall be tested in accordance with ASTM C140.
b. Six (6) mortar cube specimens shall be tested, three (3) at 7-days and three (3) at 28-days, in accordance with ASTM C109.
c. Four (4) coarse grout specimens shall be tested, two (2) at 7-days and two (2) at 28-days, in accordance with ASTM C-109.
d. In lieu of individual tests of masonry units, mortar, and grout, perform one (1) prism test (which consists of three prisms) in accordance with ASTM E447.

2. Provide continuous inspection to verify compliance of the following:
a. Cleanliness of grout space prior to grouting.
b. Placement of grout in reinforced cells.
c. Preparation of required grout and mortar specimens.
d. Welding of reinforcing bars.

3. Provide periodic inspection to verify compliance of the following:

a. Proportions of site-prepared mortar or grout.
b. Construction of mortar joints.
c. Quantity, size, location, and support of reinforcing steel.
d. Quantity, size, and placement of horizontal joint reinforcement.
e. Type, size and location of anchors.
f. Protection of masonry during cold or hot weather.

STRUCTURAL STEEL

The Contractor shall perform the following:

1) The steel fabricator shall be AISC or AWS Certified, refer to Spec. 05120.

2) Submit certified mill test reports for structural steel.

3) Submit manufacturer's certificate of compliance fro high-strength bolting and weld filler materials.
** If the fabricator is not certified, then the fabricator shall reimburse the owner for the costs of these tests.

The Special Inspector shall perform the following:

1) Provide continuous inspection to verify compliance of the following:
a. Inspection of slip-critical connections, except periodic inspection may be performed when using torque control bolts (twist off)
b. Complete and partial penetration groove welds. Ultrasonically inspect 100% of the complete penetration welds.
c. Multi-pass fillet welds and single-pass fillet welds greater than 5/16".
2) Provide periodic inspection to verify compliance of the following:
a. Material verification of high-strength bolts, nuts, and washers.
b. Material verification of structural steel.
c. Material verification of weld filler material.
d. Anchor bolt size, configuration, and embedment shall be verified prior to placement of concrete.
e. Visually inspect all field-welded connection. Visual inspection of welded joints includes periodic examination of fitup.
f. Verify stud shear connector spacing and location. Visually inspect welding of stud shear connectors.

3) Weld Inspections
a. Weld inspections shall be in accordance with AWS D1.1.
b. Review and verify compliance of written welding procedures with AWS requirements.
c. Verify that welding procedures are being adhered to during field welding.
d. Verify welder qualifications.
e. Use all means necessary to determine the quality of welds. The inspector may use gamma ray, magnafluz, trepanning, sonics or any other aid to visual inspection that the Special Inspector may deem necessary to be assured of the adequacy of the welding.
f. Keep a systematic record of all welds that include, in addition to other required records, the identification marks of welders, a list of defective welds, and the manner of correcting defects.

4) Bolting inspection and testing shall be in accordance with AISC Specifications for Structural Joints Using ASTM A325 or A490 Bolts.

STEEL JOIST

The Contractor shall perform the following:

1) Joists shall be manufactured and designed in accordance with the Steel Joist Institute specifications. Submit letter of compliance.

2) Submit shop drawings from a SJI certified firm.

The Special Inspector shall perform periodic inspections of the following:

1) Visual inspection of bolted and welded connections.

2) Verify installation of bridging or braces.

3) Verify connection for top and bottom chords.

4) Verify reinforcement of members for concentrated loads.

5) Verify proper bearing.

STEEL DECK

The Contractor shall perform the following:

1) Submit mill certification that the supplied steel complies with the specifications.

The Special Inspector shall perform periodic inspections of the following:

1) Verify general alignment and deck lap.

2) Verify screws/welds for size and pattern.

3) Verify spacing and type of sidelap attachments.

4) Verify installation of deck closures.

SPECIAL INSPECTOR RESPONSIBILITIES

The Special Inspector shall maintain records of inspections in accordance with Section 1704.2.4 and shall distribute these records to the Architect and Structural Engineer on a weekly basis. At the conclusion of the project, the Special Inspector shall submit a final report including a written statement that the special inspections during construction have complied with this Structural Quality Assurance Plan and that any discrepancies noted during construction have been corrected.

SPECIAL INSPECTIONS PER CHAPTER 17 OF THE KENTUCKY BUILDING CODE

SECTION	ITEM	REQUIRED? YES	REQUIRED? NO	REMARKS
1704.2.5	FABRICATORS	X		STEEL FABRICATION SPECIAL INSPECTION IS REQUIRED IF THE FABRICATOR IS NOT A.I.S.C. OR AWS CERTIFIED
1704.6.1	STRUCTURAL OBSERVATION FOR SEISMIC REQUIREMENTS		X	SEISMIC DESIGN CATEGORY "B"
1704.6.2	STRUCTURAL OBSERVATION FOR WIND REQUIREMENTS		X	Vasd = 89mph.
1705.2	STEEL	X		PER AISC 360 & TABLE 1705.2.2
1705.3	CONCRETE	X		PER TABLE 1705.3
1705.4	MASONRY	X		LEVEL B TMS 402/ACI 530/ASCE 5 FOR MASONRY BRG. WALL FOUNDATIONS MEET EXCEPTION
1705.5	WOOD		X	PER SECTION 1705.5
1705.6	SOILS	X		PER SECTION 1705.6
1705.7	DRIVEN DEEP FOUNDATIONS		X	NONE
1705.8	CAST IN PLACE DEEP FOUNDATIONS		X	NONE
1705.9	HELICAL PILE FOUNDATIONS		X	NONE
1705.11.1	WIND - STRUCTURAL WOOD		X	Vasd OF 89MPH
1705.11.2	WIND - COLD FORMED STEEL FRAMING		X	Vasd OF 89MPH
1705.11.3	WIND - WIND RESISTING COMPONENTS		X	Vasd OF 89MPH
1705.12.1	SEISMIC - STRUCTURAL STEEL		X	SEISMIC DESIGN CATEGORY "B"
1705.12.2	SEISMIC - STRUCTURAL WOOD		X	NONE
1705.12.3	SEISMIC - COLD FORMED STEEL FRAMING		X	NONE
1705.12.4	DESIGNATED SEISMIC SYSTEMS		X	SEISMIC CATEGORY "C"
1705.12.5	SEISMIC - ARCHITECTURAL COMPONENTS - INTERIOR/EXTERIOR NON-LOAD BEARING WALLS AND VENEER IN STRUCTURES		X	SEISMIC DESIGN CATEGORY "B"
1705.12.6	SEISMIC - MECHANICAL AND ELECTRICAL COMPONENTS		X	SEISMIC DESIGN CATEGORY "B"
1705.12.7	SEISMIC - STORAGE RACKS AND ACCESS FLOORS		X	NONE
1705.14	SPRAYED FIREPROOFING		X	NONE
1705.15	MASTIC & INTUMESCENT FIREPROOFING		X	NONE
1705.16	E.I.F.S.		X	NONE
1705.17	FIRE RESISTANT PENETRATIONS & JOINTS		X	RISK CATEGORY III, NON-HIGH RISE
1705.18	SMOKE CONTROL		X	NONE

EARTHQUAKE DESIGN DATA

RISK CATEGORY	III
IMPORTANCE FACTOR	1.25
S_S	0.187
S_1	0.1
SITE CLASS	C
S_{DS}	0.149
S_{D1}	0.113
SEISMIC DESIGN CATEGORY	B
BASIC SEISMIC-FORCE RESISTING SYSTEM	ORDINARY REINFORCED MASONRY SHEAR WALLS
DESIGN BASE SHEAR	0.0828 x W (kips)
SEISMIC RESPONSE COEFFICIENT (C_S)	0.0828
RESPONSE MODIFICATION FACTOR	3.5
ANALYSIS PROCEDURE	ELFP

SNOW DESIGN DATA

GROUND SNOW LOAD (P_g)	15 PSF
MINIMUM SLOPED ROOF SNOW LOAD (P_m)	10.4 PSF
FLAT ROOF SNOW LOAD (P_f)	10.4 PSF
IMPORTANCE FACTOR	1.1
THERMAL FACTOR (C_t)	1.0
SNOW EXPOSURE FACTOR (C_e)	0.9

DESIGN LIVE LOADS

ROOF	20 PSF

WIND DESIGN DATA

ULTIMATE DESIGN WIND SPEED (Vult)	120 MPH
NOMINAL WIND SPEED (Vasd)	93 MPH
RISK CATEGORY	III
WIND PRESSURE CATEGORY	B
INTERNAL PRESSURE COEFFICIENT	+/- 0.18

COMPONENTS AND CLADDING [H<30 FT]

	EXPOSURE B (PSF)	
ROOF 0 TO 7 DEGREES		
INTERIOR ZONE	10.5	-25.9
END ZONE	10.5	-43.5
CORNER ZONE	10.5	-65.4
ROOF >7 TO 27 DEGREES		
INTERIOR ZONE	14.9	-23.7
END ZONE	14.9	-41.3
CORNER ZONE	14.9	-61.0
ROOF >27 TO 45 DEGREES		
INTERIOR ZONE	23.7	-25.9
END ZONE	23.7	-30.3
CORNER ZONE	23.7	-30.3
WALLS		
INTERIOR ZONE	25.9	-28.1
END ZONE	25.9	-34.7

NOTE: NEGATIVE NUMBERS INDICATE A SUCTION/UPLIFT PRESSURE

SHERMAN CARTER BARNHART ARCHITECTS

STATE OF KENTUCKY * BRIAN D. SCOTT 21768 * LICENSED PROFESSIONAL ENGINEER
2/28/2025

POAGE ENGINEERS & ASSOCIATES
880 Sparta Court Suite 200
Lexington, KY 40504
Phone: (859) 255-9034
Fax: (859) 252-3130

SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

STRUCTURAL NOTES

JOB NO.	2448
DATE	02-26-25
DRAWN	srf(p24179)
CHECKED	BDS

REVISIONS

No.	Description	Date

SHEET
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GENERAL

1. Reference to standards or specifications of technical societies, organizations, or associations, or to codes of local/state authorities, means the latest standard, specification, or code adopted by the date shown on the Drawings, unless specifically noted otherwise.

2. Material, workmanship, and design shall conform to the referenced Building Code.

3. For dimensions not shown in the Structural Drawings, see the Architectural Drawings.

4. Contractor responsibilities include, but are not limited to, the following:

4.1 Coordinate the Structural Documents with the Architectural, Mechanical, Electrical, Plumbing, and Civil Documents. Architect/Structural Engineer shall be notified of any discrepancy or omission.

4.2 The structure is stable only in its completed form. Temporary supports required for stability during all intermediate stages of construction shall be designed, furnished, and installed by the Contractor.

4.3 Contractor has sole responsibility for job site safety and complying with all health and safety precautions as required by any regulatory agency. In performing construction observation visits to the job site, for the Contractor's means, methods, sequences, techniques, or procedures in performing the work.

5. Contractor shall field verify all existing conditions, elevations, and site conditions prior to construction and fabrication. Contractor shall immediately notify Structural Engineer of any existing conditions that are in conflict with the Structural Documents.

CONCRETE

1. All concrete shall conform and be designed, mixed, placed, tested, and cured in accordance with the provisions of the ACI Manual of Concrete Practice, (current edition). Special care shall be taken in curing floors, stairs, walls, and other exposed surfaces in accordance with the specifications.

2. All concrete shall develop 3,500 PSI compressive strength in 28 days.

a. W/C ratio, 0.45 for interior slabs and 0.46 for other concrete.

b. Flyash substitution is only permitted in slabs with a 15% max. content. Flyash substitution is NOT permitted in foundations.

c. Concrete structures and slabs exposed to freeze/thaw or subject to hydraulic pressure: air content 3% to 5%.

d. Other concrete, air content 2% to 4%

e. Slump limits (without a water reducer)
-Ramps & sloping surfaces: no more than 3"
-Reinforced foundations not less than 1" not more than 5"
-Other concrete not less than 1" not more than 5"

3. Dropping the concrete in excess of 10 feet, depositing in a large quantity at any point and running or working it along the forms, or any method tending to cause segregation or separation of the aggregates will not be permitted.

REINFORCEMENT STEEL

1. Reinforcement steel shall have a minimum yield strength of 60,000 PSI and conform with material specifications for reinforcing bars, ASTM A615 thru A617; see manual of standard practice, Concrete Reinforcing Steel Institute.

2. Welded wire fabric shall conform to ASTM A185.

3. All rebars shall be securely tied and held in place with a minimum concrete protection cover to all steel as follows:

Walls, Columns, Beams, and Pilasters	1 1/2"
Slabs	3/4"
Footings	3"

4. Reinforcing steel bends shall be made as per diagram, and/or in accordance with A.C.I. Code.

5. Lap all splices as specifically called for, but at least 38 bar diameters for bars less than or equal to #6, and 48 bar diameters, for bars greater than #6, (always 12 in. minimum) unless noted otherwise. Lap all splices in masonry reinforcement a minimum of 48 bar diameters.

FOUNDATION DESIGN

1. Foundations were designed using a maximum earth bearing pressure of 2,500 PSF . Refer to geotechnical report from Vector Engineers, Inc. dated 12/9/24 (project no. 24050104SHE). The contractor shall verify that field conditions comply with these recommendations. This verification shall be performed by Licensed Geotechnical Engineer.

SHALLOW FOUNDATIONS ON SOIL

1. Any soils can lose strength if they become wet, so the foundation sub grades must be protected from exposure to water. Foundation construction the following procedures.
A. For soils that will remain exposed overnight or for an extended period of time, place a "lean" concrete mud-mat over the bearing areas. The concrete should be at least 4 inches thick. Flowable fill concrete or low-strength concrete is suitable for this cover, as conditions allow;
B. Disturbed soil must be removed prior to foundation concrete placement.
C. Foundation bearing conditions must be benched level.
D. Areas loosened by excavation operations must be recompacted prior to reinforcing steel placement.
E. Loose soil, debris, and excess surface water must be removed from the bearing surface prior to concrete placement.
F. The Special Inspector shall observe all foundation excavations and provide recommendations for treatment of any unsuitable conditions encountered.
G. The bearing conditions of foundation soils (stiff or better residual soil) shall be checked by means of portable dynamic cone penetration (DCP) testing at the direction of the special inspector.

GRADE SUPPORTED FLOOR SLABS

1. The following features are required as part of grade support slab construction:

A. Keep the crushed stone moist, but not wet, immediately prior to slab concrete placement to minimize curling of the slab due to differential curing conditions between the top and bottom of the slab.

B. The Special Inspector shall review the actual subgrade conditions prior to slab construction and to make recommendations for any unsuitable conditions encountered.

C. Slab subgrade conditions are also considered earthwork areas; thus, the recommendations contained in the Earthwork section of the report apply.

WOOD

1. Structural framing plans depict the primary structural framing system. Contractor shall provide secondary and miscellaneous framing as required to complete the project (see architectural drawings).

2. Dressed Seasoned Lumber: S4S, 15% maximum moisture content at the time of dressing.

2.1 Interior and Exterior Load bearing Walls: Spruce-Pine-Fir, No. 2 grade

2.2 Lintels, Floor Joists and Beams: Southern Pine, No. 2 grade

2.3 Wood in Contact with Concrete or Masonry or Exposed to Weather: Foundation grade pressure-treated. Use galvanized nails in pressure-treated wood.

3. Engineered Lumber Products

3.1 Laminated Veneer Lumber (LVL):

Allowable Bending Stress	Fb	=2,600 psi
Compression Perpendicular to Grain	Fcper	=750 psi
Compression Parallel to Grain	Fcpar	=2,310 psi
Horizontal Shear	Fv	=285 psi
Modulus of Elasticity	E	=1,900,000 psi

4. Structural Panels

4.1 Floor Panels: Tongue-and-groove APA rated Sturd-I-Floor.
a. Panels shall have a Span Rating of 24 and Exposure 1.
b. Panels shall be placed with the "Strength Axis" perpendicular to the supports. End joints shall be staggered.
c. Floor panels shall be both glued and nailed.
d. Panels shall be nailed with 10d ring or screw-shank nails. Nailing shall be completed before glue sets.
e. Panels shall have glue applied at supports, end joints and tongue and groove joints. Adhesive shall conform to APA Specification AFG-01 or ASTM D3498, and applied in accordance with the adhesive use only solvent-based glues in accordance with panel manufacturer's recommendation.

4.2 Wall Panels: APA rated sheathing
a. Panels may be installed either horizontally or vertically.
b. Panels shall be a minimum of 24" wide.
c. There shall be a 1/8" gap at panel edges and ends.

4.3 Roof Panels: APA rated sheathing, Plywood or OSB
a. Panels shall have a Span Rating of 40/20 and Exposure 1.
b. Panels shall be placed with the long direction perpendicular to the supports and shall be a minimum of 24" wide and continuous over at least 2 supports.
c. Roof panels shall be both glued (exterior glue) and nailed.
d. Long panel edges shall be supported with Edge Clips; one located 1/8" gap at panel midway between each support. There shall be an edges and ends.
e. OSB panels shall be installed with textured side up.

5. Wood Shear walls

5.1 Shear walls shall be constructed with APA 7/16" Douglas Fir-Larch or Southern Pine structural panels. Panels shall be oriented with the long dimension in the vertical direction. Oriented strand board (OSB) may be used in lieu of plywood. OSB panels shall be APA rated and shall comply with Product Standard PS 2.

5.2 Solid 2x blocking shall be provided at unsupported, horizontal panel edges.

5.3 See shear wall schedule for nailing requirements.

5.4 Double 2x framing studs shall be used at the ends of each shear wall, UNO.

SHOP-FABRICATED WOOD TRUSSES

1. Design of wood trusses and their connections shall be the sole responsibility of the Contractor. Design and shop drawing submittals shall comply with the Specifications. Shop drawings shall be sealed by an Engineer licensed in the project state.

2. Wood trusses shall be designed for the following superimposed loads:

Roof Trusses:
Top Chord: Dead 10 psf Live 20 psf
Bottom Chord: Dead 5 psf Live 5 psf UNO

Wind Load: per KBC

Snow Load: per KBC

2.1 Superimposed dead loads due to over built wood framing shall be added to the loads given above.

STRUCTURAL STEEL

1. Steel Shapes

1.1 W-Shapes: ASTM A992 (Grade 50)

1.2 Angles, Channels, Plates, UNO: ASTM A36

1.3 Square/Rectangular/Round Hollow Structural Sections (HSS): ASTM A500, Grade B

1.4 Structural steel exposed to weather shall be galvanized.

2. Anchor Rods, Bolts, and Studs

2.1 Anchor Rods: ASTM F1554, Grade 36. Headed Rods or threaded rods with plate washer and heavy hex nut.

2.2 All bolts for structural steel joint fasteners shall be 3/4"Ø high strength structural bolts, ASTM A325, Torque Control (Tension Set), unless otherwise noted.

3. Post-Installed Anchors: The procedure listed below are the design basis for these project. Installation of expansion anchors shall be in accordance with the ICC ES report and manufacturer's instructions for the particular anchor.

3.1 Expansion Anchors: Hilti Kwik Bolt TZ2 (ICC-ES ESR-4266), Simpson Strong-Tie Bolt 2 (ICC-ES ESR-3037), or Power-Stud+ SD2 (ICC_ES ESR-2502). Minimum embedment = 6 times anchor diameter, UNO.

3.2 Adhesive Anchors

3.2.1 All-thread steel anchor conforming to ASTM A307 Grade A or ASTM A36 or ASTM F1554 Grade A36, zinc plated in accordance with ASTM B633.

3.2.2 Adhesive conforming to Hilti HIT-RE-500 V3 (ICC-ES ESR-3814) or Hilti HIT-HY200 V3 (ICC-ES ESR-4868 (conc.) ESR-4878 (grouted cmu), Simpson SET-XP Epoxy-Tie (ICC-ES ESR-2508), or Powers PE1000+ Epoxy Adhesive (ICC-ES ESR-2583), or Powers AC100+ Gold Adhesive (ICC_ES ESR-2582). Minimum embedment = 6 times anchor diameter, UNO.

3.2.3 For hollow concrete masonry, use screen tube approved by manufacturer and an adhesive conforming to Hilti HY-270 (ICC-ES ESR-4143) or Simpson Strong-Tie SET (ICC-ES ESR-1772).

3.3 Screw Anchors: Hilti KH-EZ (ICC-ES ESR-3027 (conc.) ESR-3056 (grouted cmu) or Simpson Titan-HD (Concrete: ICC-ES ESR-2713; Grouted Masonry: ICC-ES ESR-1056) or Powers Wedge-Bolt+ (ICC-ES ESR-2526). Minimum Embedment = 6 times anchor diameter, UNO.

3.4 Substitutions will only be considered for products that have a code report recognizing the product for the appropriate application. The substitution request shall be accompanied by calculations that demonstrate the substituted product is capable of achieving the equivalent performance values of the design-basis product.

4. Structural steel shall be fabricated and erected according to the "Specification for Structural Steel Buildings" dated August 1, 2022 and the AISC "Code of Standard Practice for Steel Buildings and Bridges" dated May 9, 2022.

5. Connections shall be detailed based on the design information provided in the Structural Documents

5.1 Standard Shear Connections: Details as bolted or welded double-angle, sible-plate, single-angle, or tee connections in accordance with the connection tables in the "Manual of Steel Construction", Thirteenth Edition.

5.1.1 Shear connections not defined in the AISC Manual shall be designed by an Engineer licensed in the project state. This design service shall be included in the Contractor's scope of services. Shop drawings of such connections shall be sealed by the Engineer.

5.2 Factored Design Forces/Reactions: As shown on the Structural Drawings or, if not shown, the factored design reaction shall be half of the "Maximum Total Uniform Load (LRFD)" tabulated in the "Manual of Steel Construction", Thirteenth Edition.

5.3 Steel connections not specifically detailed in the Structural Drawings shall be designed by the Contractor. This design service shall be included in the Contractor's scope of services. Shop drawings of such connections shall be sealed by an Engineer licensed in the project state.

6. Shop Drawings: Submittal shall adequately depict structural members and connections.

7. All structural steel shall be fabricated and erected in accordance with the latest OSHA regulations regarding steel erection.

CONCRETE MASONRY

1. CMU Minimum Compressive Strength, f'm = 1,500 psi.

2. Mortar: Walls below grade Type M
Bearing Walls Type M or S

3. Coarse Grout: 3,000 psi. min. compressive strength conforming to ASTM C476.

3.1 Grout solid bond beams, reinforced CMU cores, and CMU cores and wall cavities below grade.

3.2 Masonry webs on each side of grouted cells shall be fully mortared.

4. Horizontal Joint Reinforcement: Two (2) No. 9 gage longitudinal wires at 16" vertically, UNO. Provide accessories for corners, intersections, etc.

5. Provide open bottom beam block units with 3" deep minimum web openings at horizontal reinforcement locations. A minimum clear space of one bar diameter shall be provided between the reinforcing bars and the face of masonry units.

6. CMU has been designed assuming "running bond" placement. Do no use "stack bond" unless approved by Structural Engineer.

7. Submit written construction procedures prior to the start of masonry construction.

8. No chases, risers, conduits, or toothing of masonry shall occur in masonry walls within 18 inches of beam bearing centerline.

9. Lap splices in reinforcing to be 48 bar diameters.

10. In addition to spacing indicated on plans, provide vertical bars at all corners, ends, jambs, intersections and both sides of control joints.

11. Extend all vertical reinforcement thru or into bond beams.

12. Provide dowels from supporting member (footing, beam, or slab) for all reinforced walls same size, location and spacing as wall reinforcing.

13. Vertical reinforcement shall be centered in cells of masonry unit, unless otherwise noted.

14. Bar positioners shall be used to hold vertical and bond beam reinforcement in proper alignment.

15. Vertical bars shall be held in position at top and bottom and at intervals not exceeding 200 bars diameters or 8 feet.

16. Grouting of masonry lintels over openings shall be accomplished in one continuous operation.

17. Grouting shall be stopped 1 1/2" below the top of a course to form a key at the pour joint.

18. Grout all cells of concrete masonry units below grade or slab.

19. Provide cleanout holes at least 3 inches in least dimension for grout pours over 5 feet in height.

A. At structurally reinforced walls provide cleanout holes at each structural vertical reinforcing bar.

B. Cleanout closures shall be braced to resist grout pressures.

20. See architectural drawings for locations of vertical control joints.

21. At vertical control joints, bond beam reinforcement and joint reinforcement shall be discontinuous. Provide two 3/4" diameter smooth dowels by 1'-4" across each control joint. Grease one end.

22. Special Inspections are required for the masonry construction on this project. The inspections include but are not limited to contiuous inspections during the grouting process. Refer to Chapter 17 of the Kentucky Building Code, current edition, for specific requirements.

NOTE TO CONTRACTOR:

The contractor shall coordinate the Structural Drawings with the Architectural, Mechanical, and Electrical Drawings and make certain all pipes, sleeves, ducts, inserts, and openings are located and in place before each concrete pour.

The Contractor shall verify all dimensions shown on the Structural Drawings with dimensions shown on the Architectural Drawings. The Contractor shall check and approve, with reasonable promptness, shop drawings and schedules for coordination of details, sizes, fitting tolerances, and dimensions. The Contractor shall stamp or sign these drawings and schedules with his approval and then submit them to the Architect for review.

SHERMAN CARTER BARNHART ARCHITECTS

STATE OF KENTUCKY · BRIAN DAVID SCOTT · LICENSED PROFESSIONAL ENGINEER · 28202 · 2/28/2025

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SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

STRUCTURAL NOTES

JOB NO.	2448
DATE	02-26-25
DRAWN	srf(p24179)
CHECKED	BDS

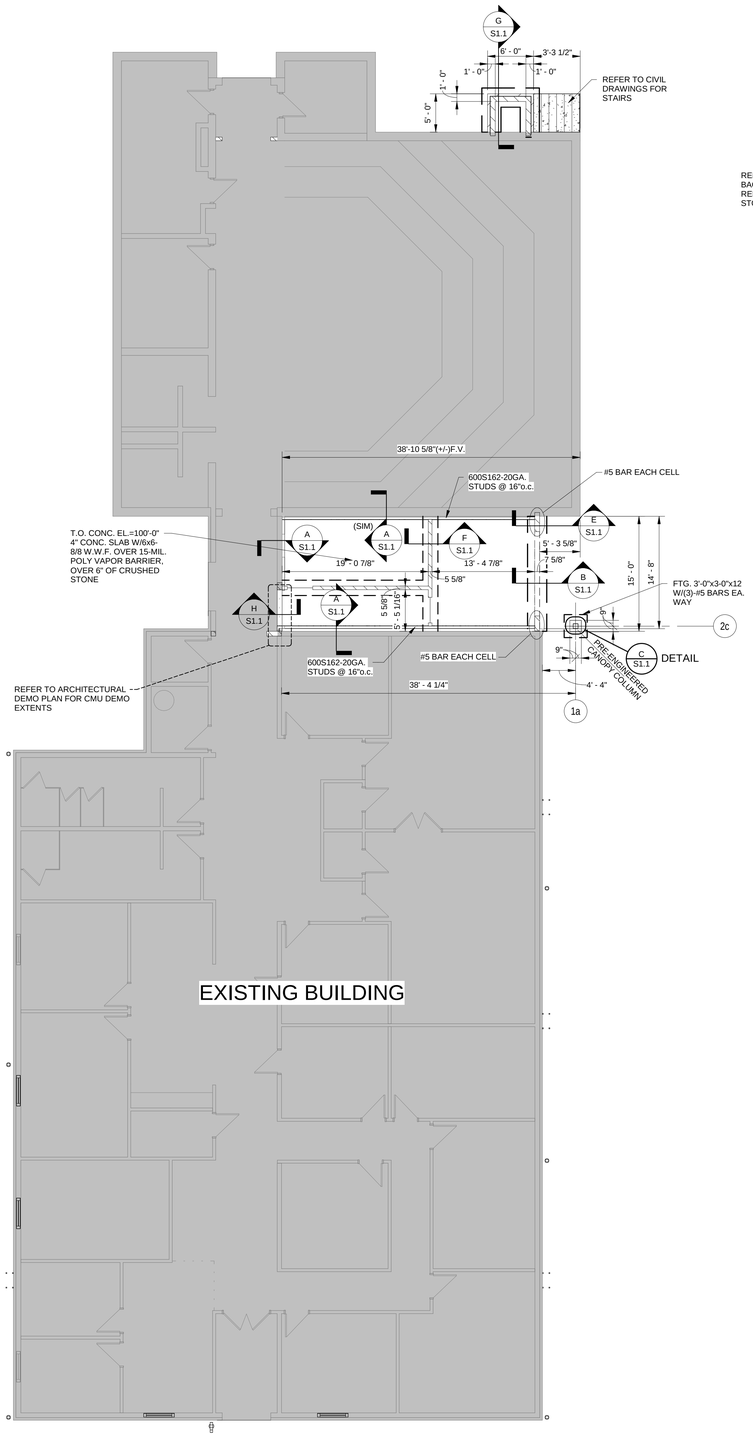
REVISIONS

No.	Description	Date

SHEET

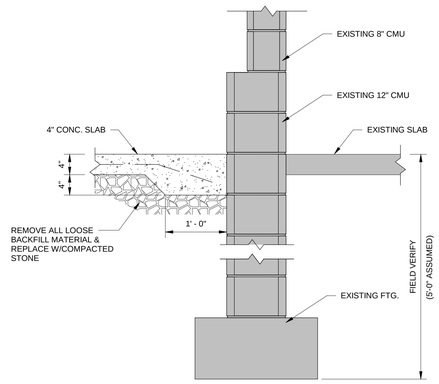
S0.1

2448
SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
2/28/2025 2:21:06 PM



VESTIBULE FOUNDATION PLAN

-INDICATES EXISTING CONSTRUCTION



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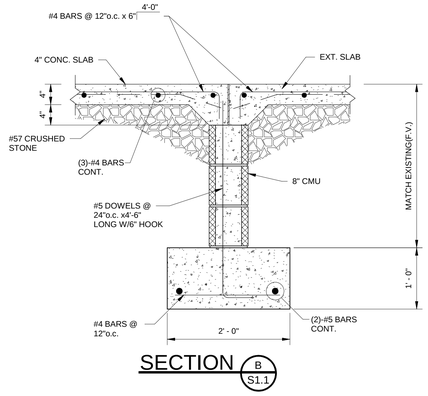

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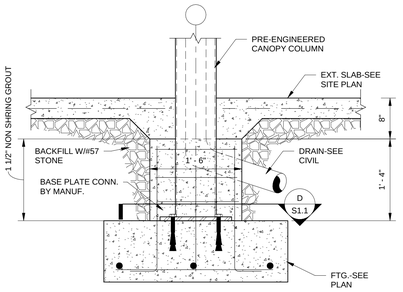

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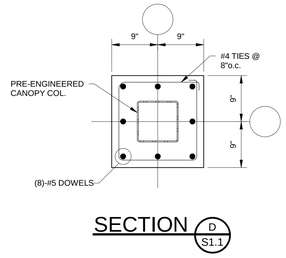

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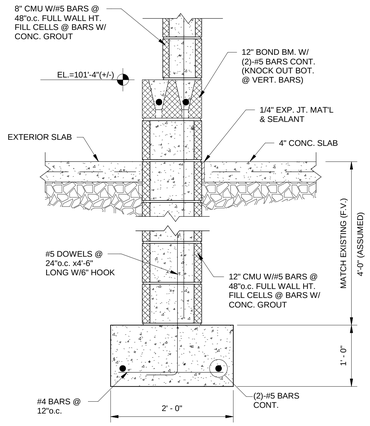

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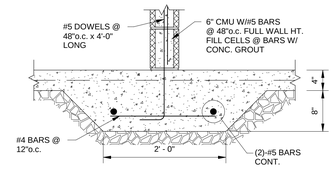

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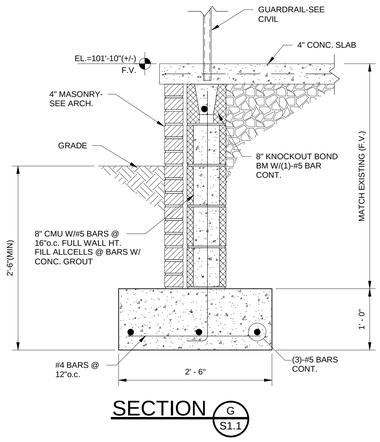

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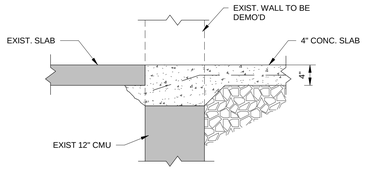

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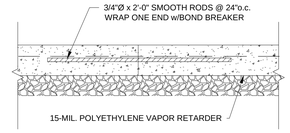

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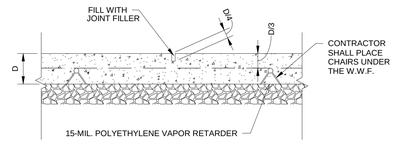

TYPICAL CONTROL JOINT DETAIL

SHERMAN CARTER BARNHART ARCHITECTS

COMMONWEALTH OF KENTUCKY · BRIAN DAVID SCOTT · 27277 · LICENSED ARCHITECT · STATE OF KENTUCKY
2/28/2025

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SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION

110 REASOR AVENUE

TAYLORSVILLE, KENTUCKY

ADMIN. BLDG VESTIBULE FOUNDATION PLAN

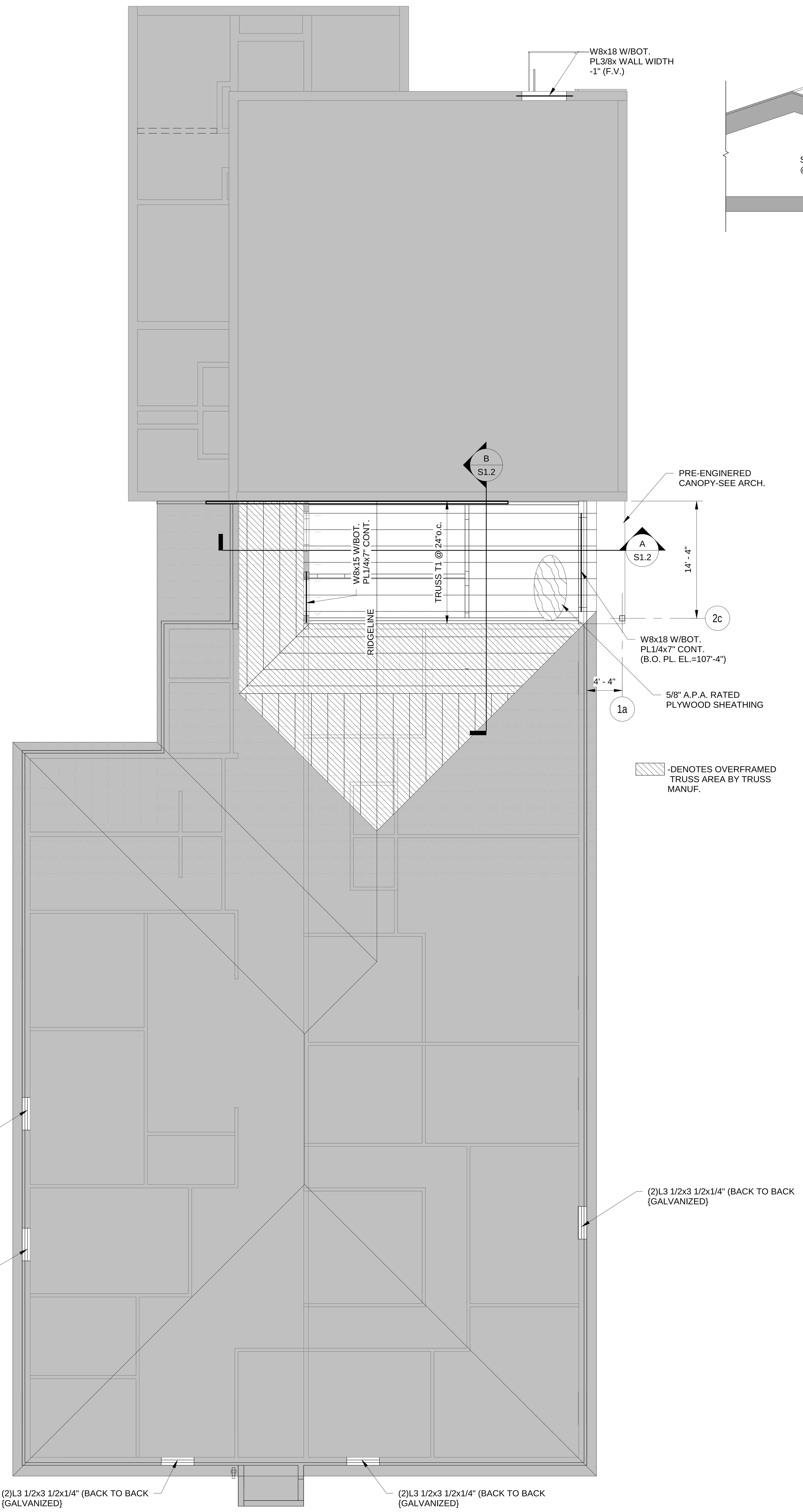
JOB NO.	2448
DATE	02-26-25
DRAWN	srf(p24179)
CHECKED	BDS

REVISIONS

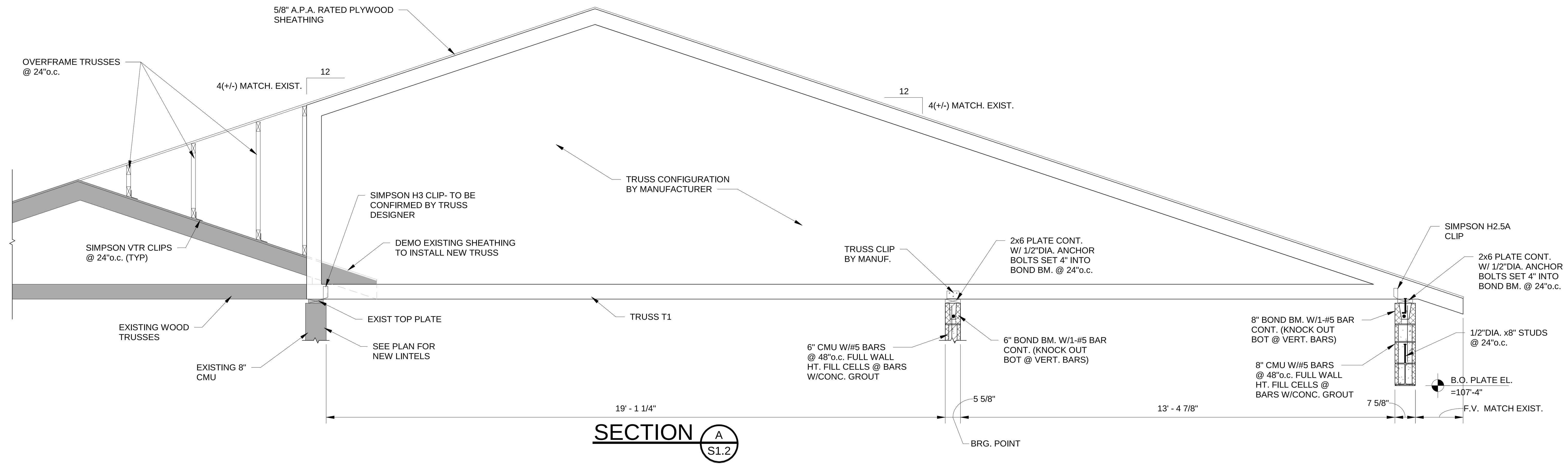
No.	Description	Date

SHEET

S1.1



ADMIN. BLDG. VESTIBULE ROOF FRAMING PLAN



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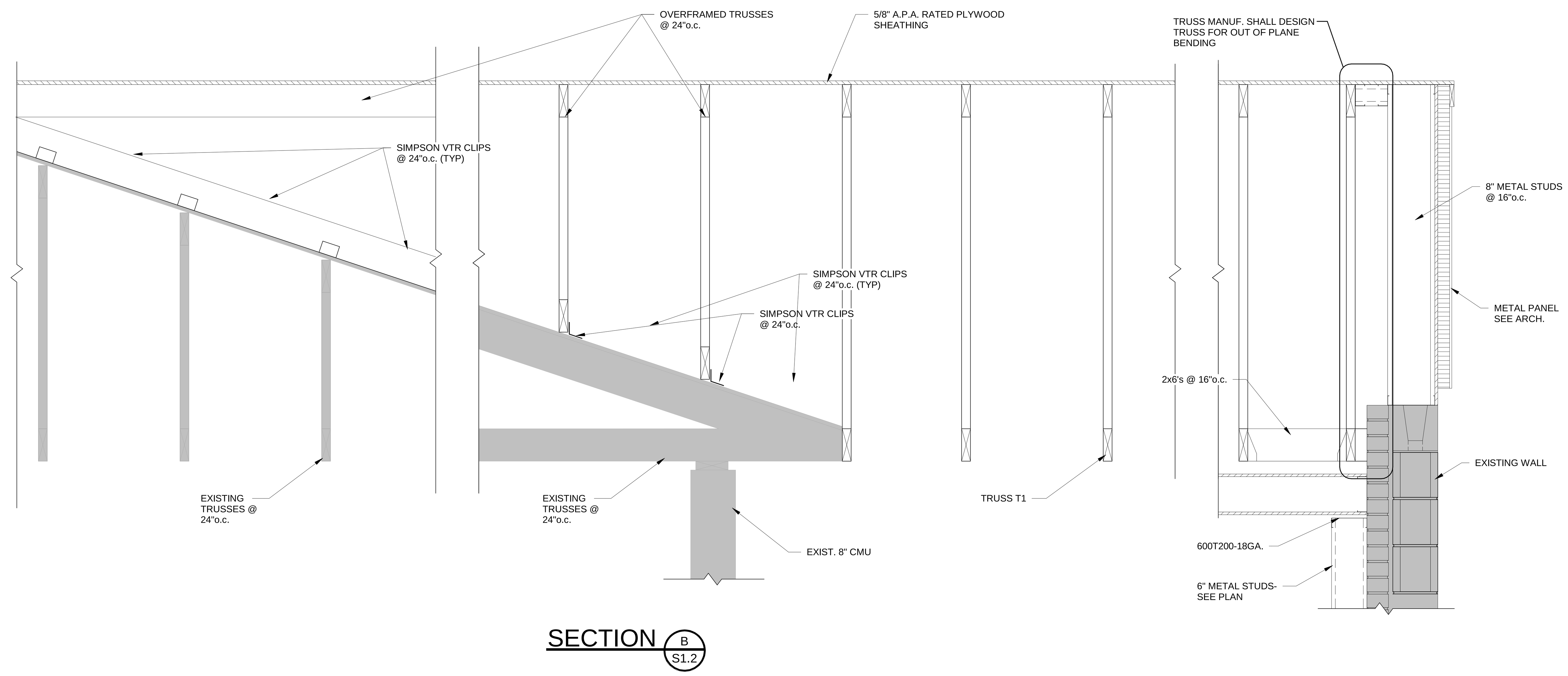

SECTION B S1.2

SHERMAN CARTER BARNHART ARCHITECTS

STATE OF KENTUCKY BRIAN SCOTT 21138 LICENSED PROFESSIONAL ENGINEER 2/28/2025

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SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

ADMIN. BLDG. VESTIBULE ROOF FRAMING PLAN

JOB NO.	2448
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SHEET

S1.2

2448
SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
2/28/2025 2:21:08 PM

COLD FORMED STEEL HEADERS					
OPENING SIZE	WALL TYPE	WEB MEMBERS	TRACKS	JACK STUDS[2]	KING STUDS[2]
0'-8" to 6'-0"	6" CFS WALL	(2)800S162-18GA	(2)600T200-18GA	(2)600S162-18GA(BTB)	(2)600S162-18GA(BTB)
6'-0" to 13'-0"	6" CFS WALL	(2)1000S162-16GA	(2)600T300-16GA	(2)600S162-16GA(BTB)	(2)600S162-16GA(BTB)
0'-8" to 6'-0"	8" CFS WALL	(2)1000S162-18GA	(2)800T200-18GA	(2)800S162-18GA(BTB)	(2)800S162-18GA(BTB)
6'-0" to 13'-0"	8" CFS WALL	(2)1200S162-16GA	(2)800T300-16GA	(2)800S162-16GA(BTB)	(2)800S162-16GA(BTB)

NOTES: (BTB) = BACK-TO-BACK
1. FOR CONNECTION INFORMATION REFER TO CFS DETAILS ON FOLLOWING 'SECTIONS & DETAILS' SHEETS.
2. JACK & KING STUDS SHALL MATCH THE GAUGE & TYPE OF STUD WALL WHERE THE OPENINGS ARE LOCATED.

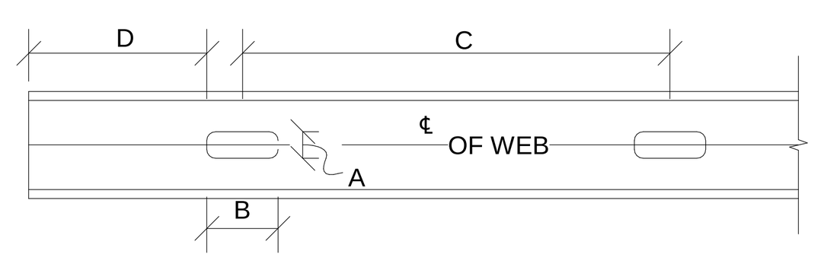
TYPICAL WALL FASTENING SCHEDULE FOR CFS WALLS	
CONNECTION	FASTENING
WALL BOTTOM TRACK TO FLOOR	#8 SCREWS @12"o.c.
WALL BOTTOM TRACK TO FOUNDATION	1/2"Ø ANCHOR BOLTS @24"o.c.
WALL BOTTOM TRACK TO WOOD SILL PLATE	STEEL PLATE SPACED @4'-0"o.c. w/(4) #8 SCREWS & (4) 10d NAILS OR (6) 8d COMMON NAILS
WALL STUD TO TOP OR BOTTOM TRACK	(2) #8 SCREWS AT EACH END PER FLANGE
STRUCTURAL PANELS, SUBFLOORS, & ROOFS (NAIL & GLUE SUBFLOORS)	#10 SCREWS @6"o.c. ALONG ALL EDGES & @12"o.c. ALONG INTERMEDIATE MEMBERS
* SHEARWALLS	N/A
*NON-STRUCTURAL WALLS (GYPSUM BOARD ON FRAMING)	#6 SCREWS @12"o.c.

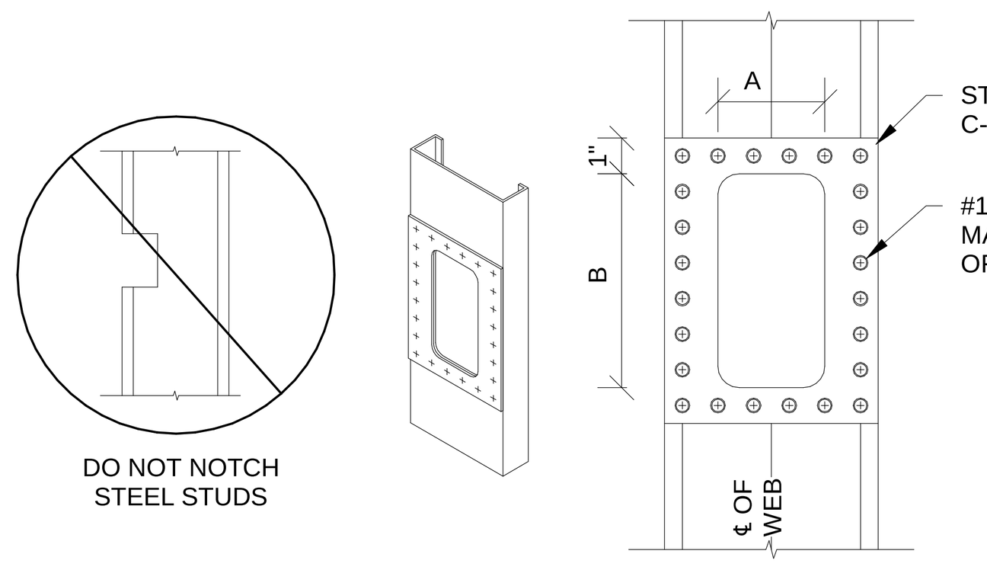
NOTE:
ALL WOOD STRUCTURAL PANELS SHALL BE ATTACHED TO STEEL FRAMING w/FLAT-HEAD SELF-DRILLING TAPPING SCREWS w/MINIMUM HEAD DIAMETER OF 0.292 IN (8MM)

MAXIMUM HOLE SIZE W/O REINFORCING WALL FRAMING				
STUD SIZE	MAX. HOLE DEPTH (A)	MAX. HOLE LENGTH (B)	MAX. HOLE SPACING (C)	MAX. HOLE EDGE DIST. (D)
3 5/8" STUD	1 1/2"	4"	7"	10"
6" STUD	1 1/2"	4"	11"	10"
8" STUD	1 1/2"	4"	18"	10"
10" STUD	1 1/2"	4"	20"	10"
12" STUD	1 1/2"	4"	24"	10"

MAXIMUM HOLE SIZE W/ REINFORCING WALL FRAMING				
STUD SIZE	MAX. HOLE DEPTH (A)	MAX. HOLE LENGTH (B)	MAX. HOLE SPACING (C)	MAX. HOLE EDGE DIST. (D)
3 5/8" STUD	1 3/4"	6"	16"	10"
6" STUD	3"	6"	16"	10"
8" STUD	4"	8"	24"	10"
10" STUD	5"	10"	24"	10"
12" STUD	6"	12"	24"	10"

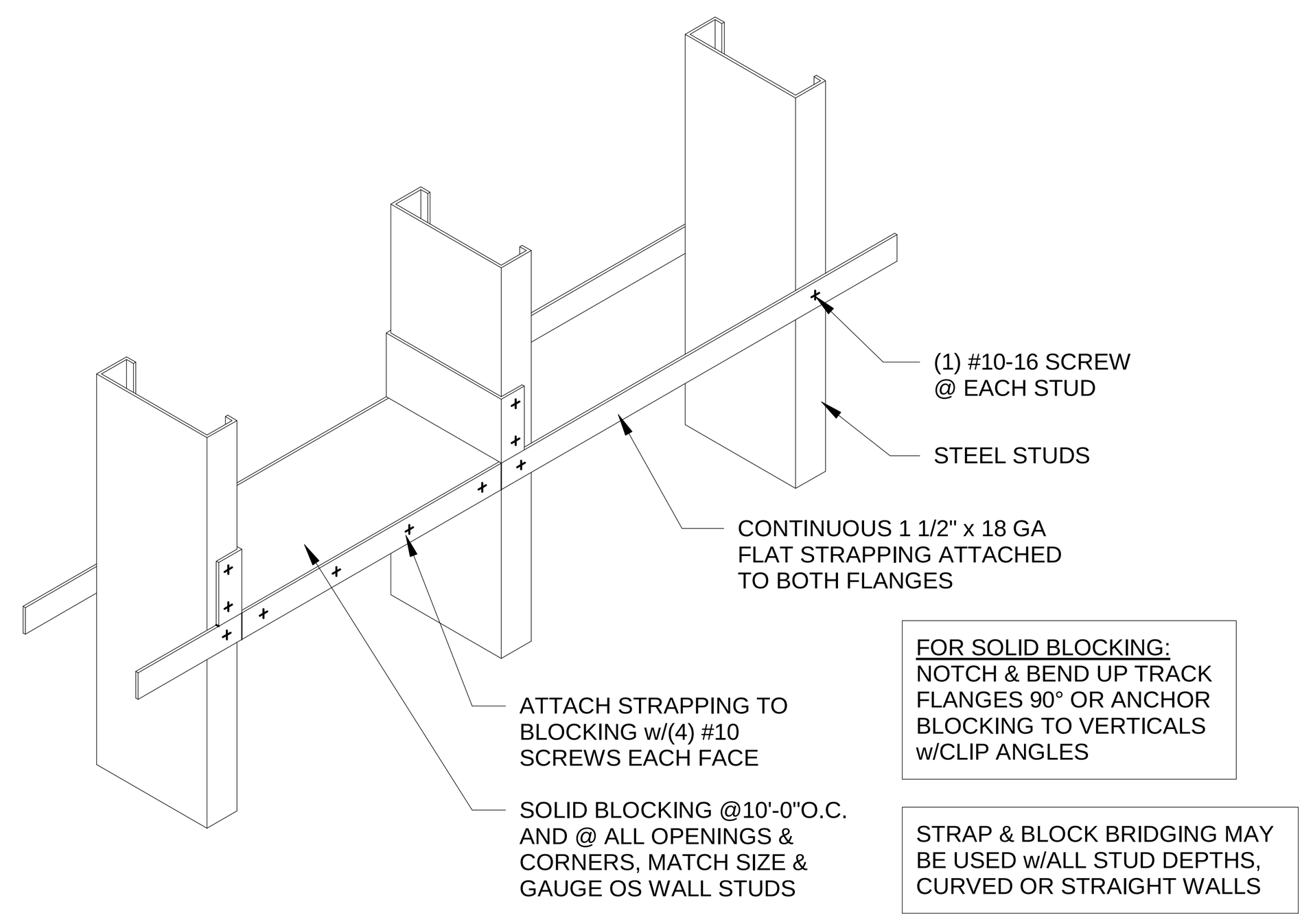
MAXIMUM HOLE SIZE W/O REINFORCING JOIST FRAMING				
STUD SIZE	MAX. HOLE DEPTH (A)	MAX. HOLE LENGTH (B)	MAX. HOLE SPACING (C)	MAX. HOLE EDGE DIST. (D)
6" STUD (20,18,16, 14,12 GA.)	1 1/2"	4"	7"	10"
8" STUD (18,16,14, 12 GA.)	1 1/2"	4"	11"	10"
10" STUD (16,14,12 GA.)	1 1/2"	4"	16"	10"
12" STUD (16 GA.)	1 1/2"	4"	20"	10"
12" STUD (14 & 12 GA.)	1 1/2"	4"	24"	10"





NOTE:
STEEL PATCH SHALL BE OF A THICKNESS EQUIVALENT TO OR GREATER THAN THE RECEIVING MEMBER AND SHALL EXTEND A MINIMUM OF 1" BEYOND ALL EDGES OF THE HOLE.

STUD HOLE PENETRATION



LOAD BEARING WALL BRIDGING

(FOR WALLS WITH SHEATHING PLACED PERPENDICULAR TO FRAMING)

LINTEL SCHEDULE: NEW AND EXISTING WALLS

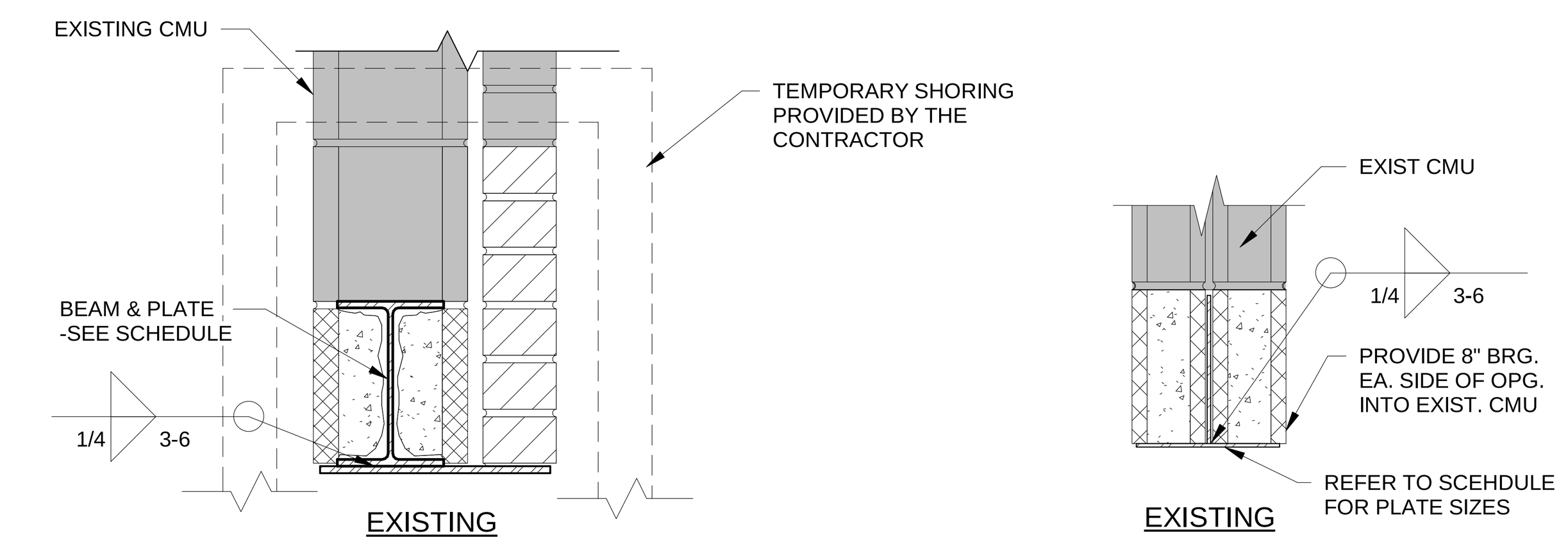
OPENING	4" BRICK		4" BLOCK		6" BLOCK		8" BLOCK* (EXIST.)		8" BLOCK	
	SIZE	SHAPE	SIZE	SHAPE	SIZE	SHAPE	SIZE	SHAPE	SIZE	SHAPE
0 TO 4'-0"					BOND BM. w/1-#5 BAR		PL1/4x7"(H) PL1/4x4"(V)		BOND BM. w/1-#5 BAR	
4'-1" TO 6'-0"					W8x10 w/ PL1/4x51/4"		PL5/16x7"(H) PL5/16x6"(V)		16" BOND BM w/2-#5 BARS	
6'-1" TO 8'-0"					W8x13 w/ PL1/4x51/4"		W8x18 w/ PL1/4x7"		W8x15 w/ PL1/4x7"	
8'-1" TO 10'-0"					W8x15 w/ PL1/4x5 1/4"		W8x21 w/ PL5/16x7"		W8x18 w/ PL5/16x7"	
10'-1" TO 12'-0"							W8x24 w/ PL5/16x7"		W8x21 w/ PL5/16x7"	
12'-1" TO 14'-0"							W8x24 w/ PL5/16x7"		W8x24 w/ PL5/16x7"	
14'-1" TO 16'-0"							W8x28 w/ PL5/16x7"		W8x28 w/ PL5/16x7"	

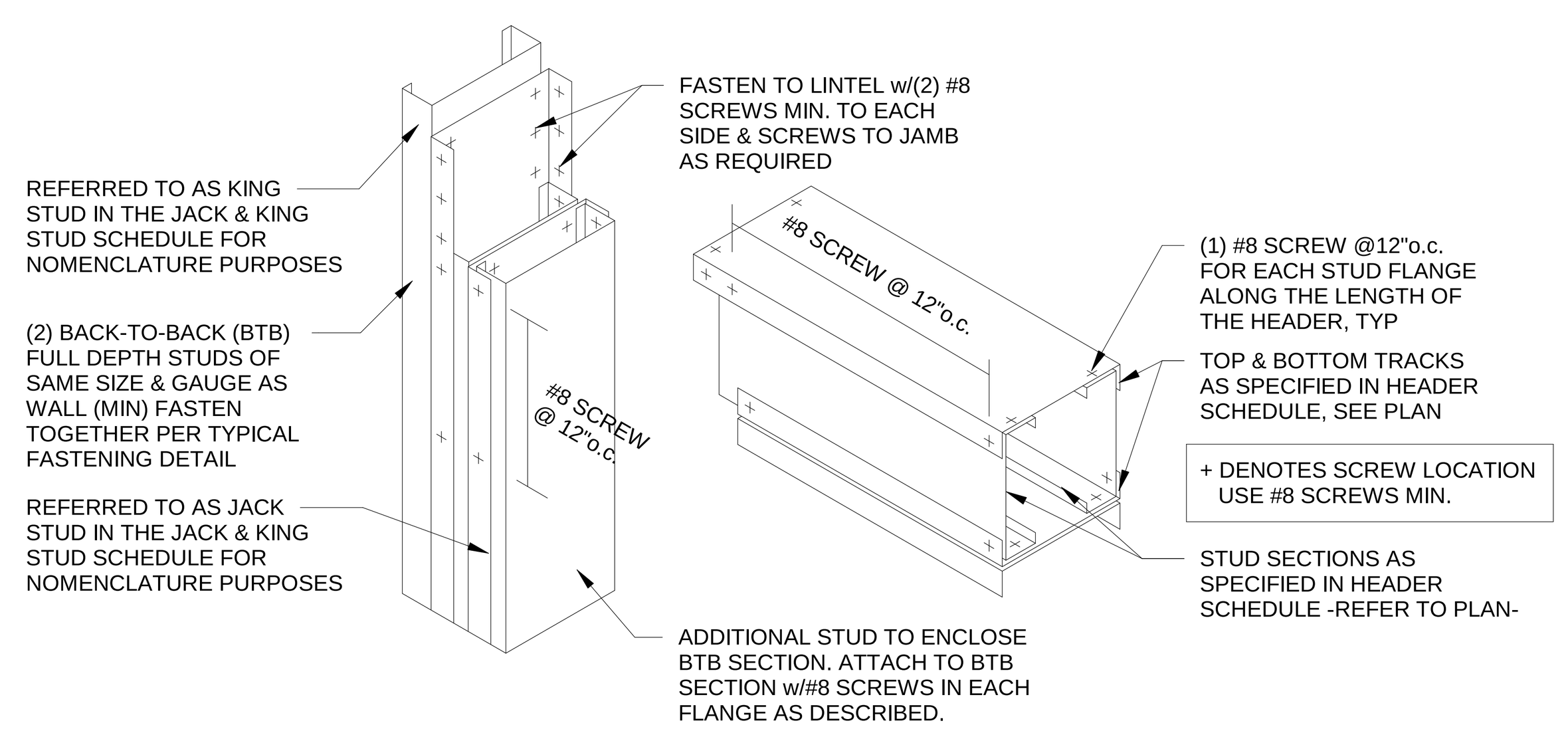
OPENING	12" BLOCK (EXIST.)		12" BLOCK		8" BLOCK & 4" BRICK (EXIST.)		8" BLOCK & 4" BRICK		12" BLOCK & 4" BRICK		4" BLOCK & 12" BLOCK & 4" BRICK	
	SIZE	SHAPE	SIZE	SHAPE	SIZE	SHAPE	SIZE	SHAPE	SIZE	SHAPE	SIZE	SHAPE
0 TO 4'-0"					W8x10 W/ PL5/16x13"							
4'-1" TO 6'-0"					W8x15 W/ PL5/16x13"							
6'-1" TO 8'-0"					W8x21 w/ PL5/16x13"							
8'-1" TO 10'-0"					W8x24 w/ PL5/16x13"							
10'-1" TO 12'-0"					W8x28 w/ PL3/8x13"							
12'-1" TO 14'-0"					W8x31w/ PL3/8x13"							
14'-1" TO 16'-0"					W8x35 w/ PL3/8x13"							

*OR (2)4" CMU WALLS

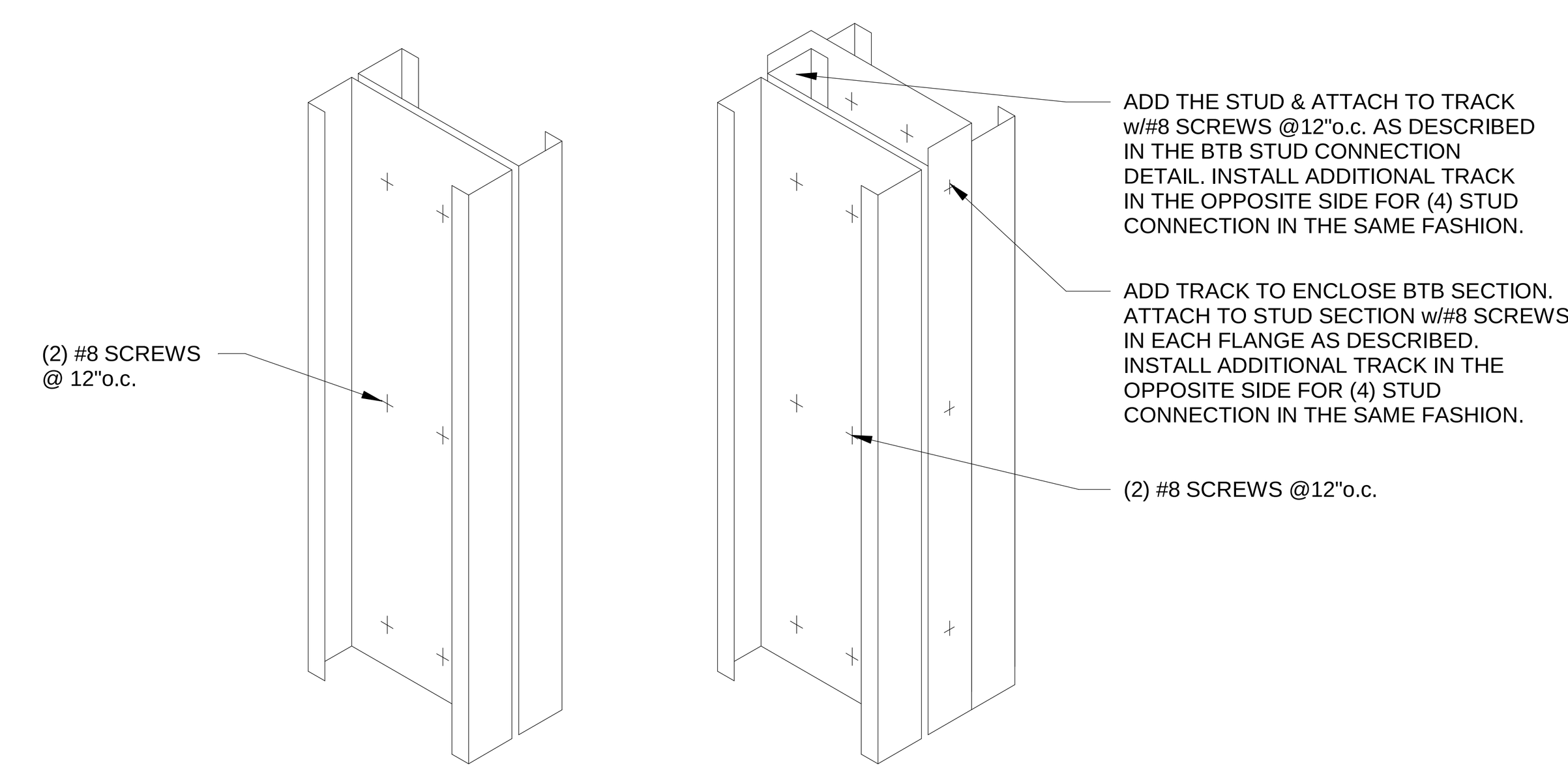
NOTE:
1.) THIS LINTEL SCHEDULE IS FOR ALL MASONRY OPENINGS SHOWN ON THE ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS. THE CONTRACTOR SHALL REVIEW ALL DRAWINGS AND PROVIDE ALL NECESSARY STEEL LINTELS AND MISC. FRAMING REQUIRED TO COMPLETE THE PROJECT WHETHER SHOWN ON THIS LINTEL SCHEDULE OR NOT.
2.) AT EXTERIOR WALL CONDITIONS, ONLY THE STEEL PLATE SHALL BE GALVANIZED, PROVIDED THE STEEL BEAM IS NOT EXPOSED.
3.) IF THE LINTEL OCCURS AT A CORNER, THE STEEL PLATE SHALL BE EXTENDED TO A MITERED CORNER.
4.) ALL LINTEL BEAMS OVER MASONRY OPENINGS GREATER THAN 6'-0" SHALL HAVE NELSON STUDS. REFER TO TYPICAL LINTEL BEAM DETAIL.
5.) ALL LINTEL BEAMS SPANNING GREATER THAN 8'-0" SHALL HAVE BEARING PLATES AND THE BOTTOM PLATE SHALL EXTEND FULL BEAM LENGTH. REFER TO TYPICAL BEAM BEARING DETAIL.
6.) PLATE WIDTH MAY VARY FROM STANDARD SIZES SHOWN. CONTRACTOR SHALL VERIFY SIZE SO THAT WIDTH=(WALL THICKNESS - 1").
7.) IN LOCATIONS WHERE BOND BEAMS WILL ATTACH TO STEEL COLUMNS, THE CONTRACTOR SHALL SUBSTITUTE A STEEL BEAM AND PLATE. REFER TO THE SCHEDULE FOR THE NEXT AVAILABLE SIZE.
8.) THIS SCHEDULE APPLIES FOR MASONRY OPENINGS REQUIRED BY SOFFITS OR RECESSED DOOR OPENINGS SHOWN ON ARCHITECTURAL DRAWINGS UNLESS SHOWN ON THE STRUCTURAL DRAWINGS.
9.) ALL LINTELS SHALL BEAR A MINIMUM OF 8" ON CMU. BEARING ON BRICK VENEER DOES NOT COUNT TOWARDS THE MINIMUM BEARING REQUIREMENTS.
10.) REFER TO ARCH. DEMO PLANS FOR NEW OPENINGS IN EXISTING WALLS.

TYPICAL LINTEL BEAM DETAILS





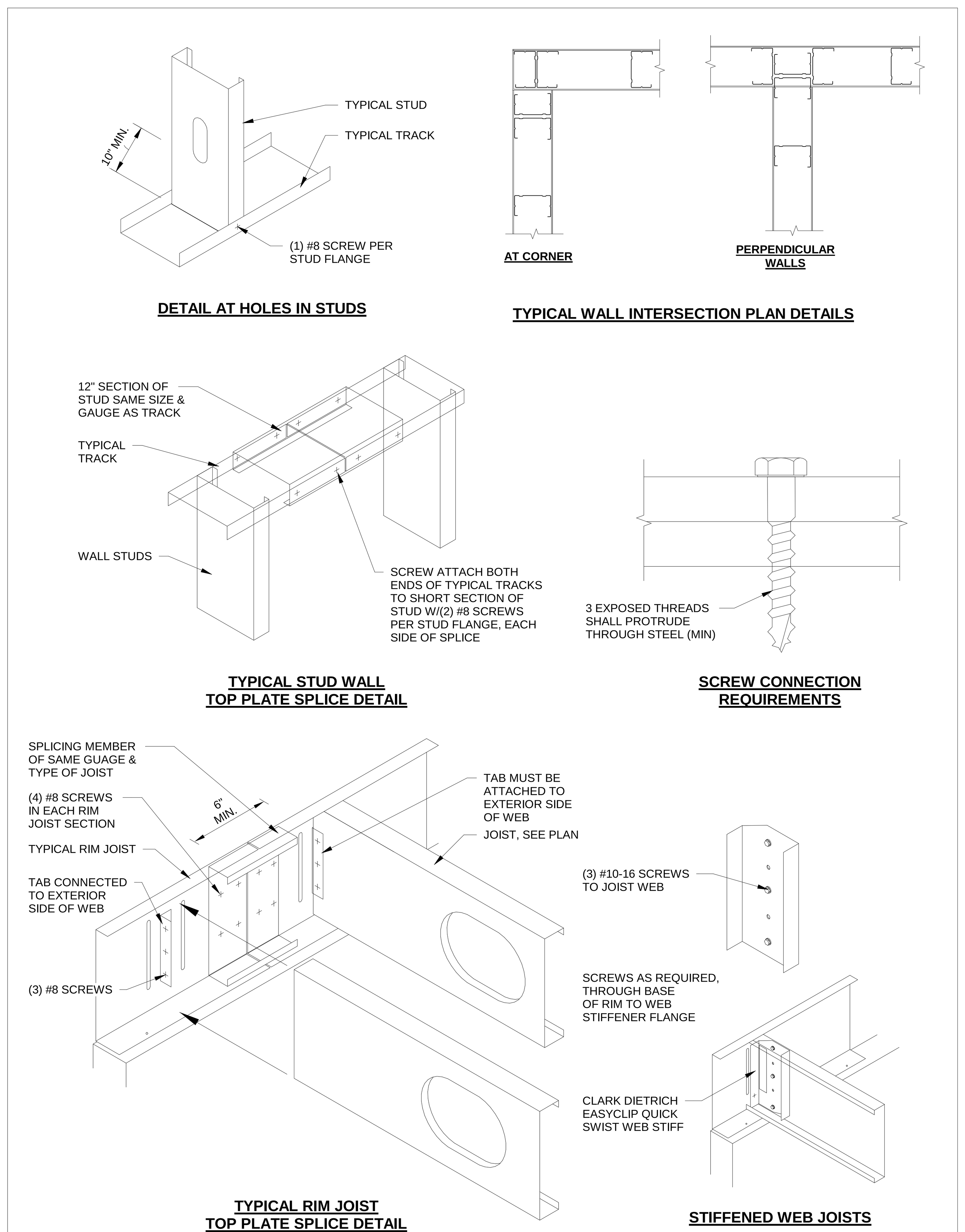
TYPICAL HEADER-JAMB CONNECTION



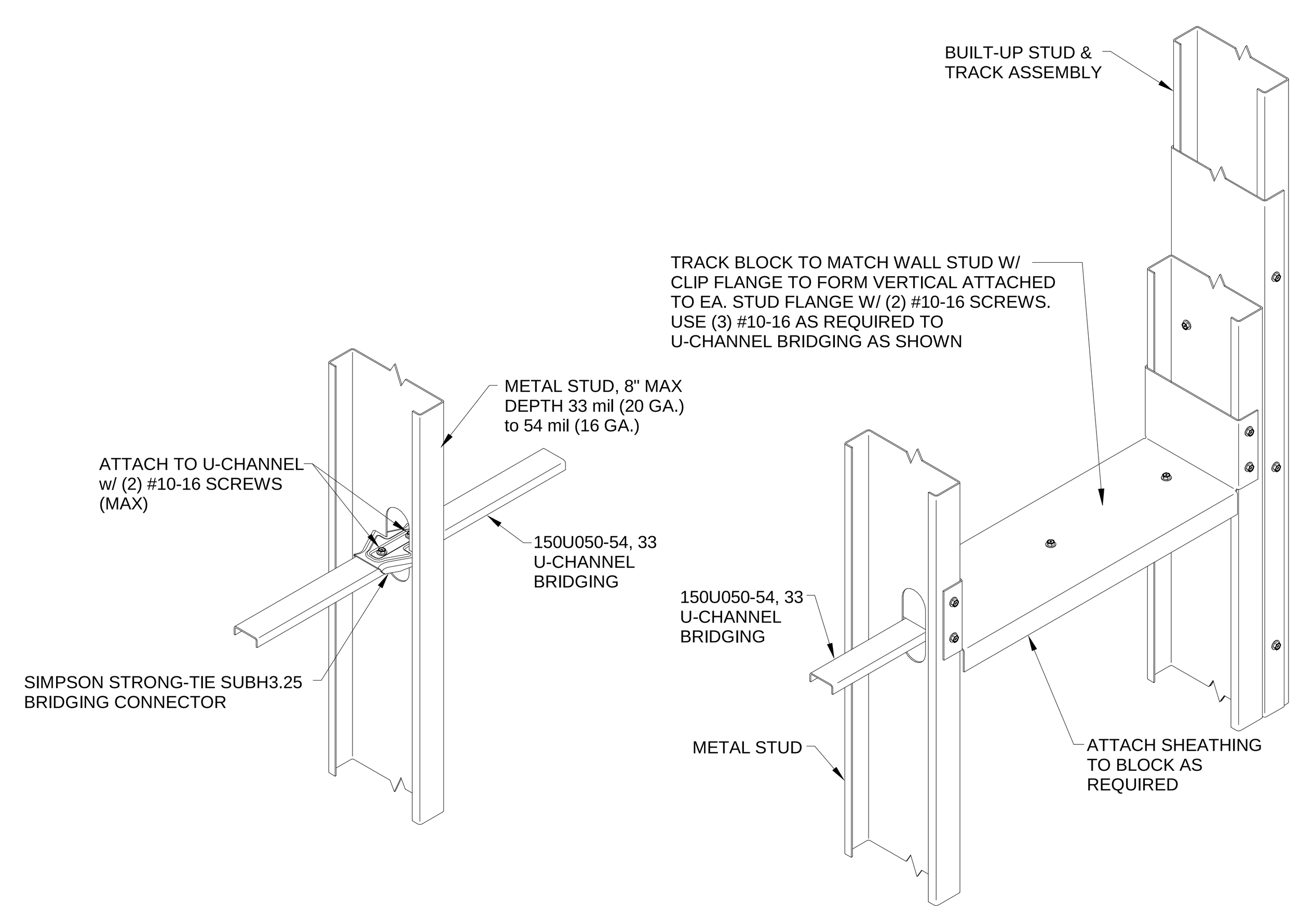
BACK TO BACK (BTB) STUD CONNECTION

DOUBLE BACK TO BACK (BTB) STUD CONNECTION

TYPICAL FASTENING PATTERN FOR MULTIPLE CFS STUDS

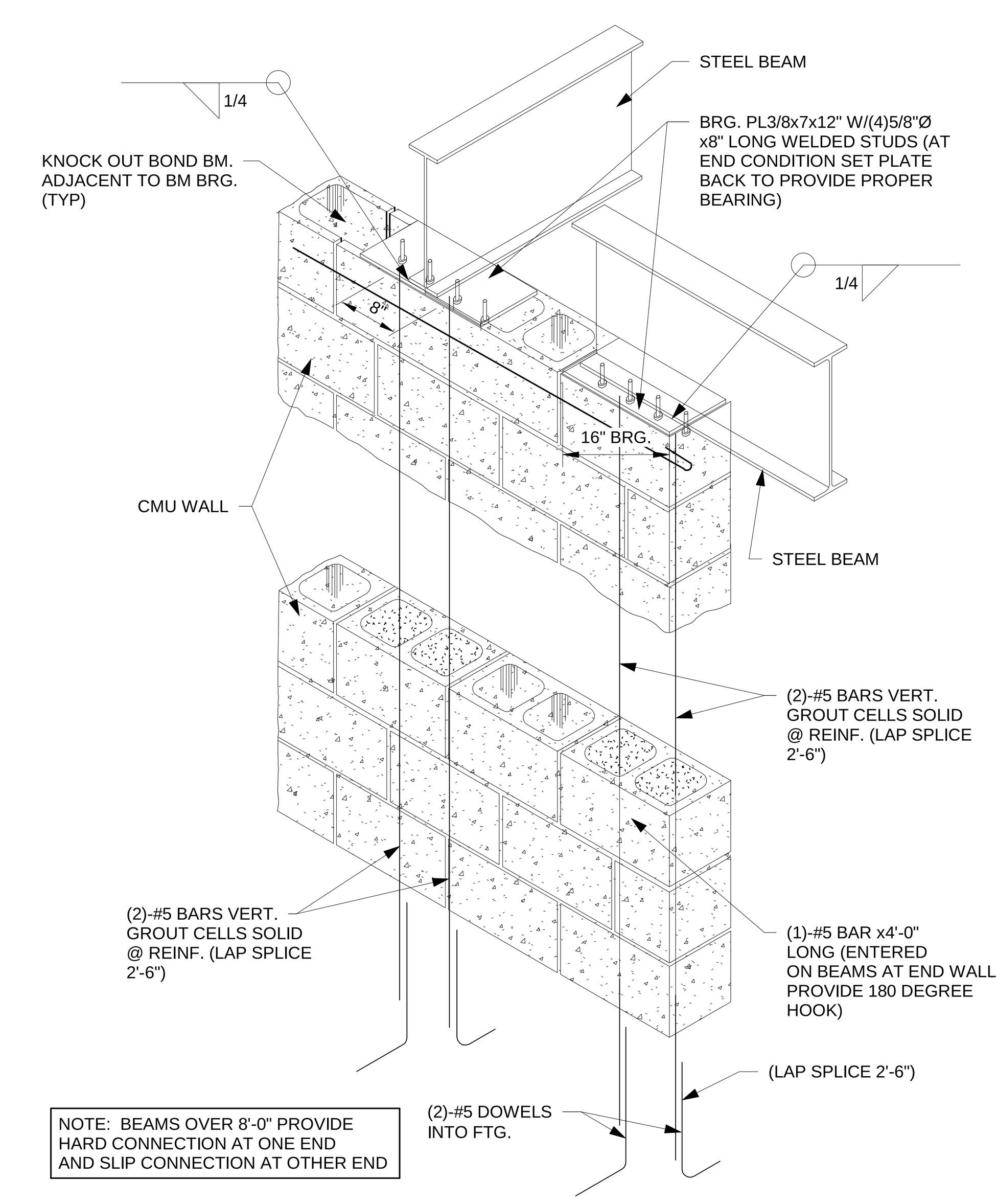


TYPICAL METAL STUD FRAMING DETAILS



EXTERNAL WALL BRIDGING

(BRIDGE EXTERIOR WALL AT MID-HEIGHT)



NOTE: BEAMS OVER 8'-0" PROVIDE HARD CONNECTION AT ONE END AND SLIP CONNECTION AT OTHER END

TYPICAL BEAM BRG. @ C.M.U.

SHERMAN CARTER BARNHART ARCHITECTS

STATE OF KENTUCKY * BRIAN D. SCOTT 21768 LICENSED PROFESSIONAL ENGINEER
2/28/2025

POAGE ENGINEERS & ASSOCIATES
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Lexington, KY 40504
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SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

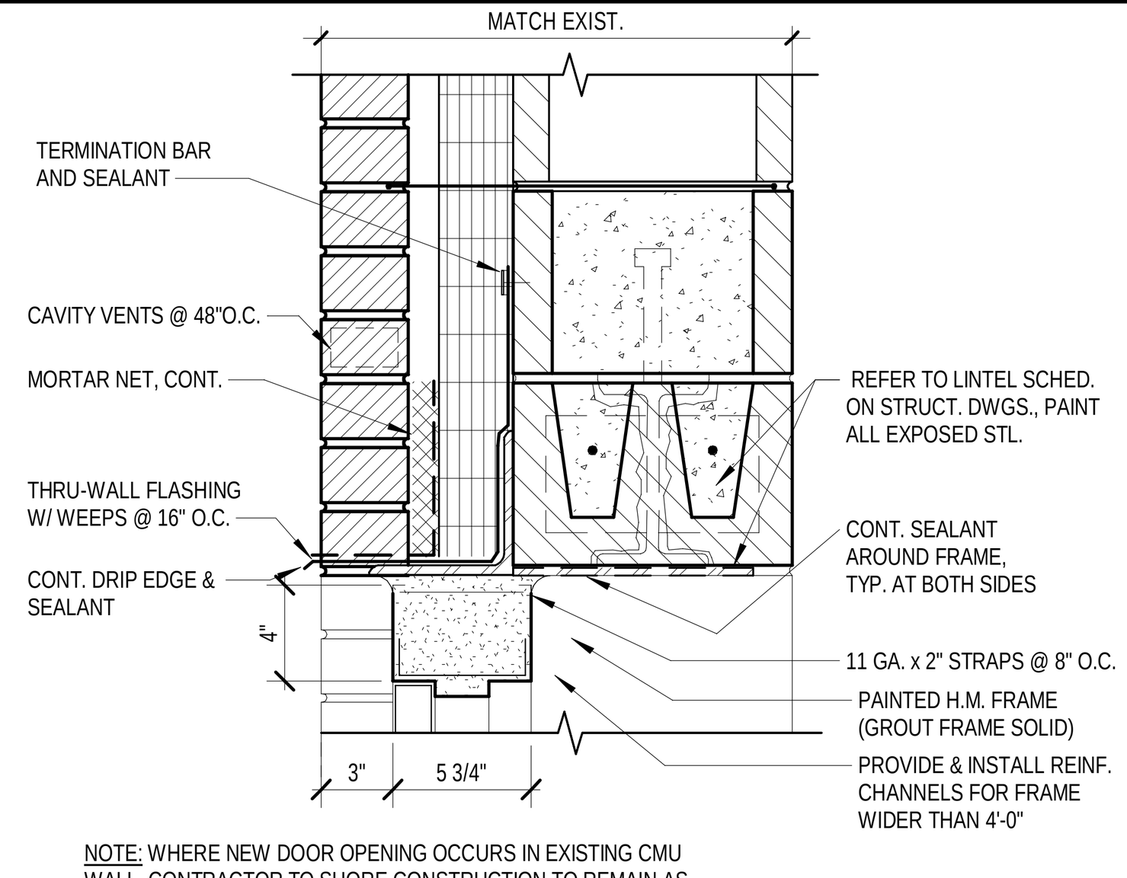
SECTIONS & DETAILS

JOB NO.	2448
DATE	02-26-25
DRAWN	srf(p25179)
CHECKED	BDS

REVISIONS

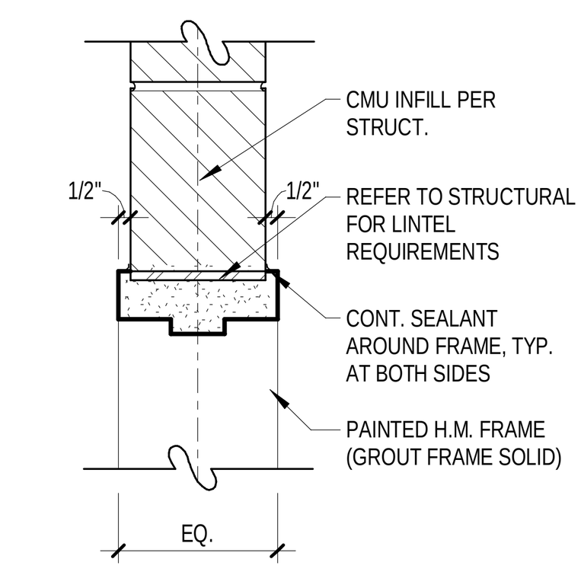
No.	Description	Date

SHEET
S3.1

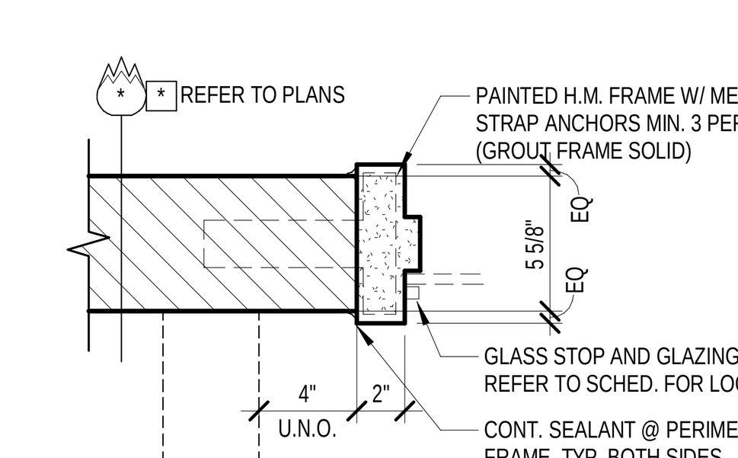


NOTE: WHERE NEW DOOR OPENING OCCURS IN EXISTING CMU WALL, CONTRACTOR TO SHORE CONSTRUCTION TO REMAIN AS NEEDED. TOOTH IN NEW CMU INTO EXISTING COURSING.

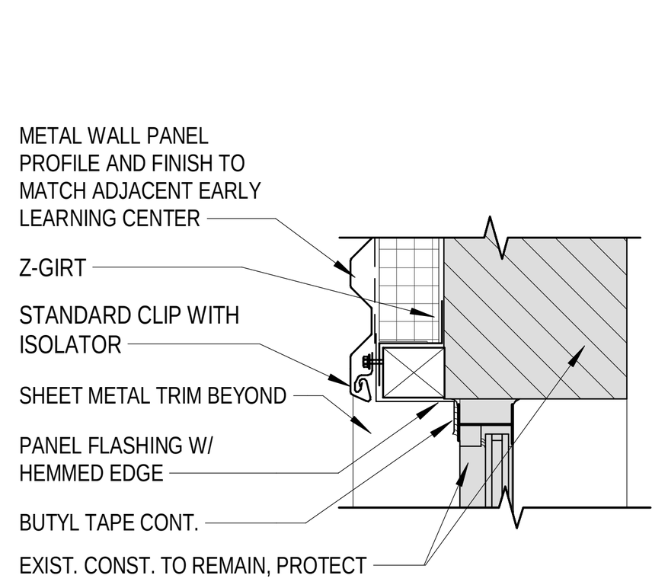
7 TYP. H.M. HEAD DETAIL @ EXTERIOR
1 1/2" = 1'-0" NOTE: CONFIRM FIELD DIMESNIONS WITH ARCHITECT



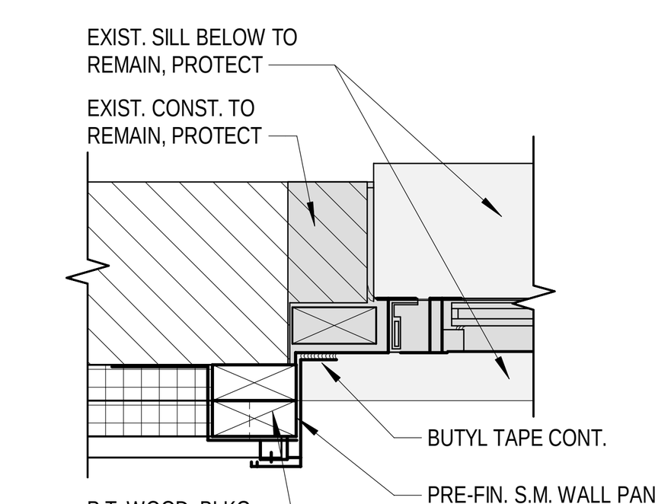
8 TYP. H.M. HEAD DETAIL
1 1/2" = 1'-0"



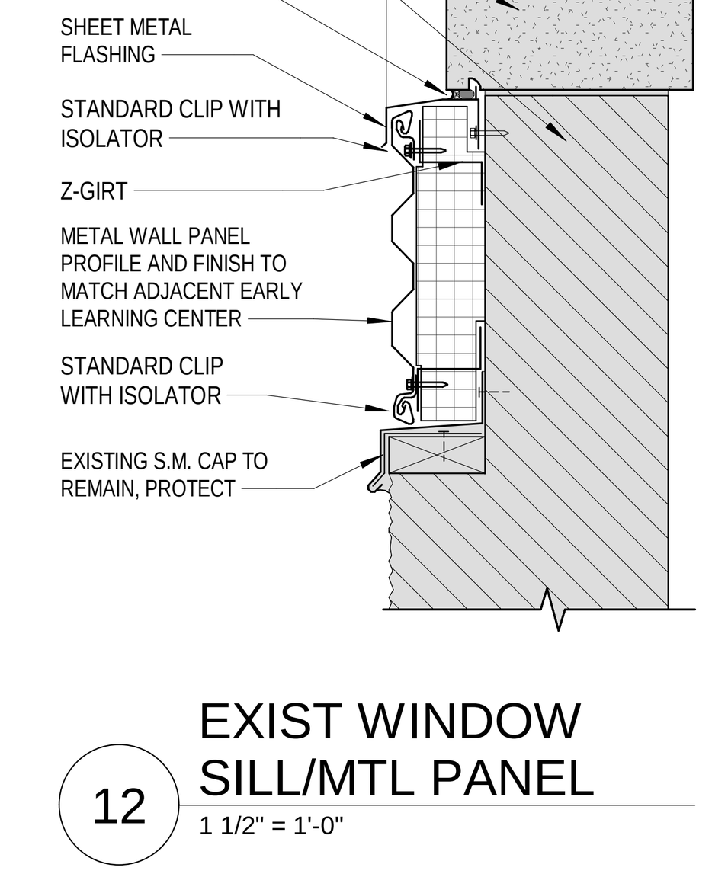
9 TYP. H.M. JAMB @ CMU
1 1/2" = 1'-0"



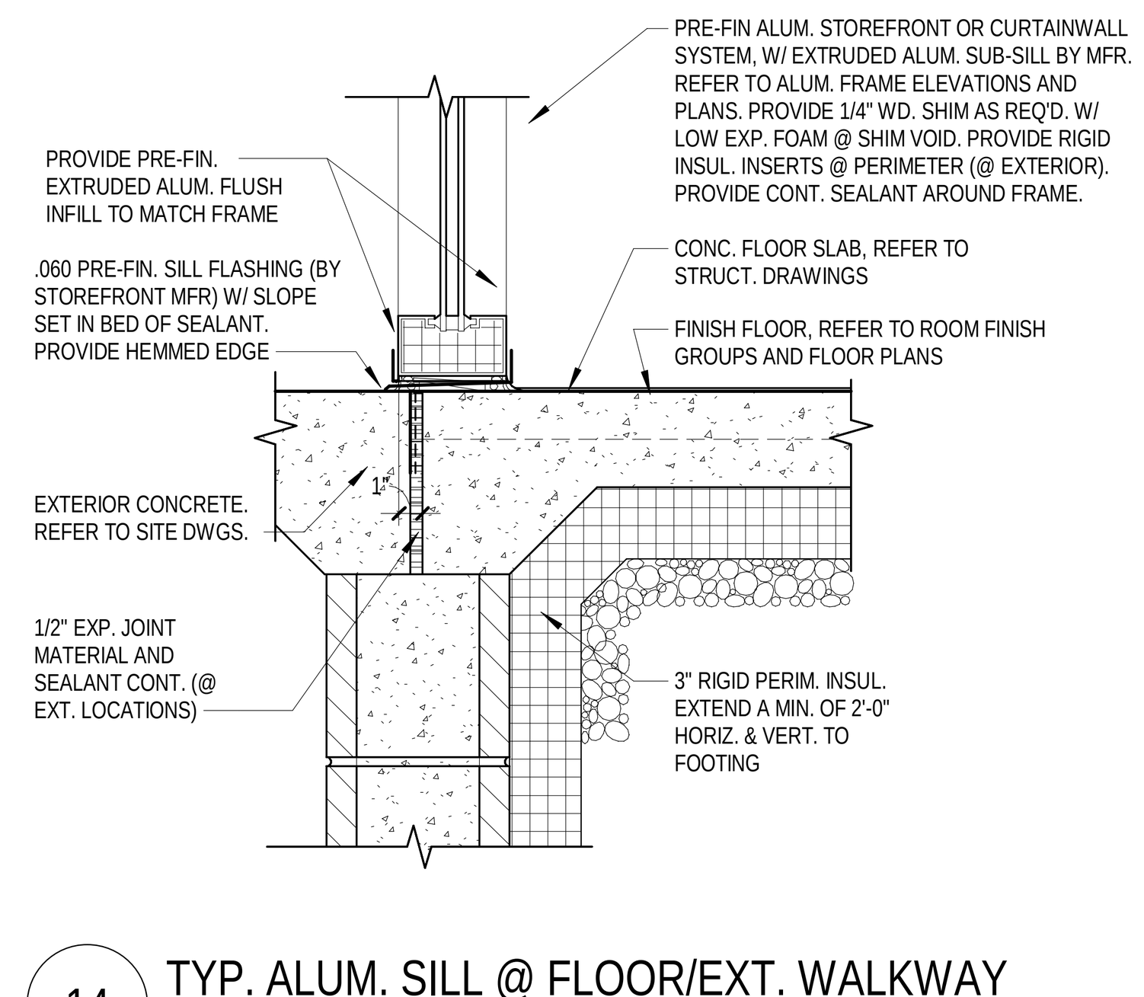
10 EXIST WINDOW HEAD/MTL PANEL
1 1/2" = 1'-0"



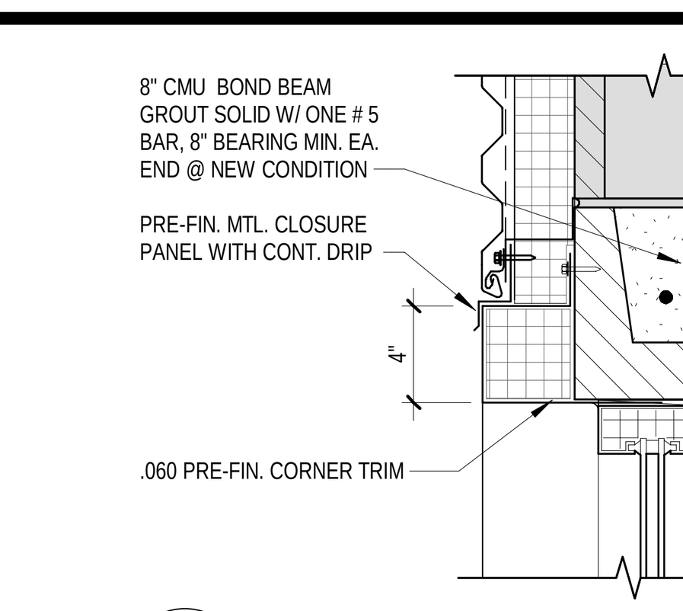
11 EXIST WINDOW JAMB/MTL PANEL
1 1/2" = 1'-0"



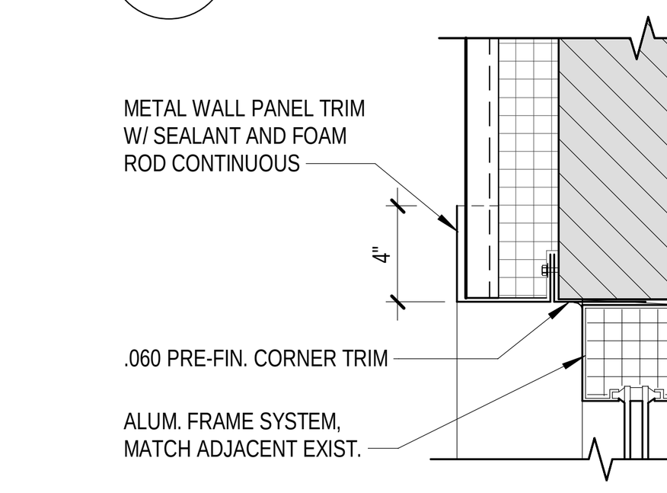
12 EXIST WINDOW SILL/MTL PANEL
1 1/2" = 1'-0"



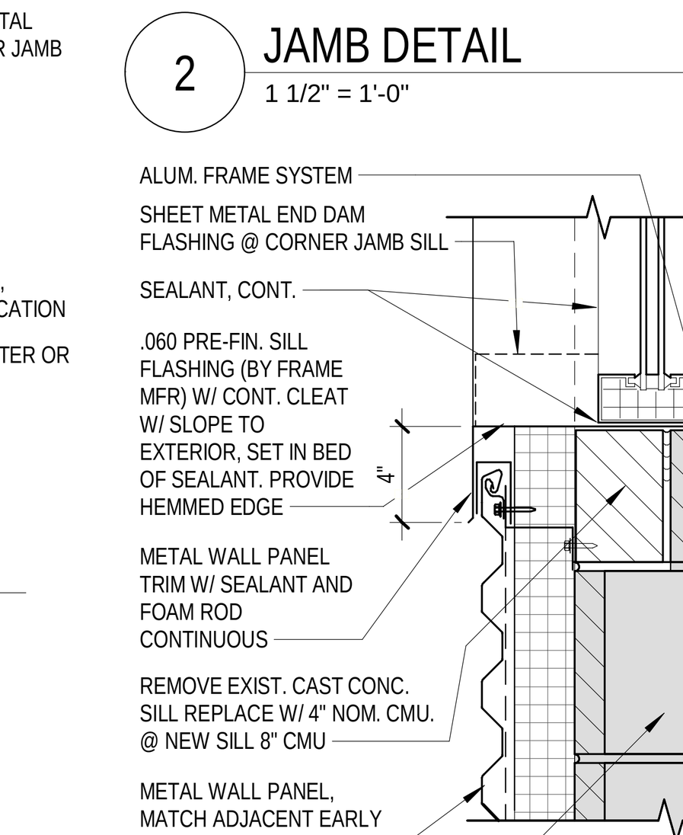
14 TYP. ALUM. SILL @ FLOOR/EXT. WALKWAY
1 1/2" = 1'-0"



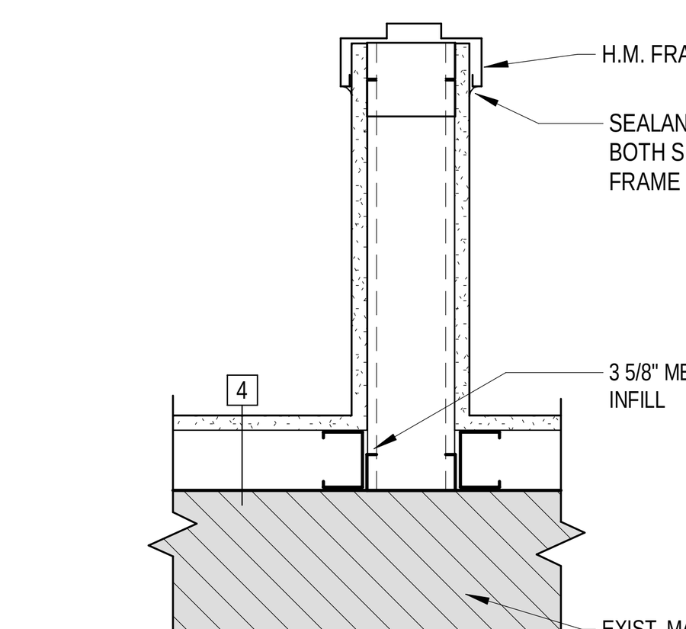
1 HEAD DETAIL
1 1/2" = 1'-0"



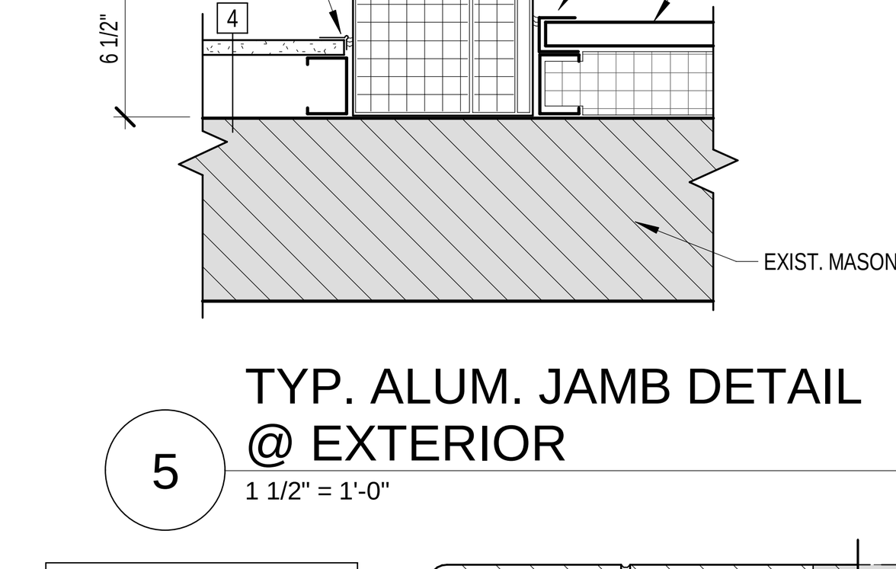
2 JAMB DETAIL
1 1/2" = 1'-0"



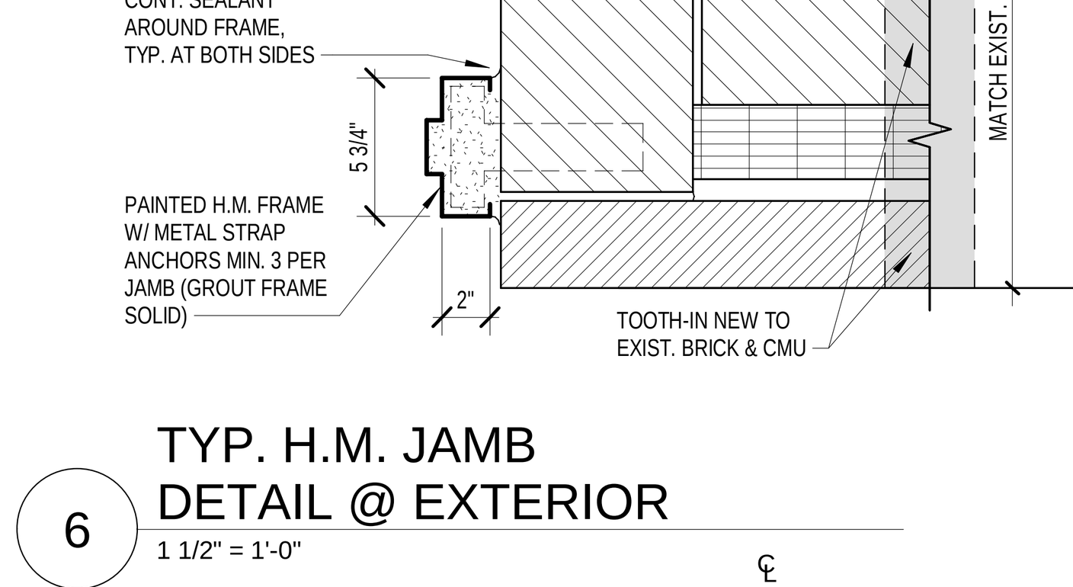
3 SILL DETAIL
1 1/2" = 1'-0"



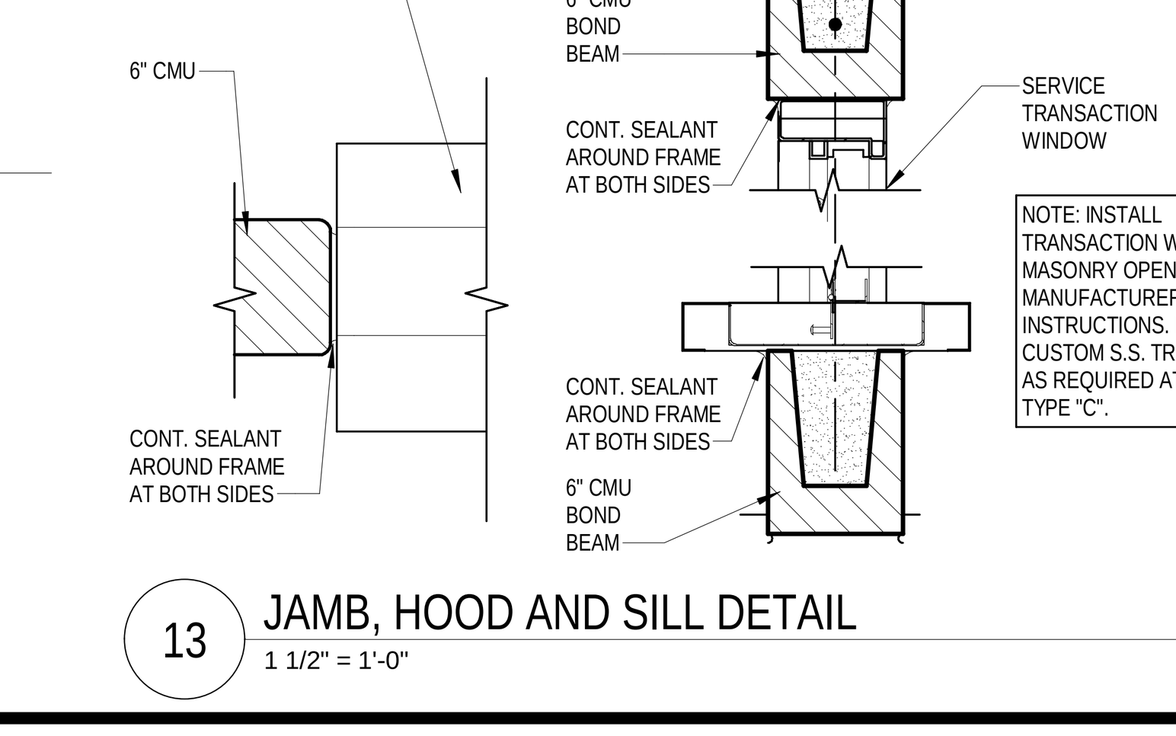
4 JAMB DETAIL
1 1/2" = 1'-0"



5 TYP. ALUM. JAMB DETAIL @ EXTERIOR
1 1/2" = 1'-0"



6 TYP. H.M. JAMB DETAIL @ EXTERIOR
1 1/2" = 1'-0"



13 JAMB, HOOD AND SILL DETAIL
1 1/2" = 1'-0"

DOOR SCHEDULE

NO.	NO. OF LEAVES	LEAF WIDTH	HT.	DOOR MATL.	DOOR TYPE	DOOR GLAZING	FRAME MATL.	FRAME TYPE	FRAME GLAZING	HEAD	JAMB	FIRE RATING	CLOSER DEG.	REMARKS
E01	1	3' - 0"	7' - 0"	H.M.	F	-	H.M.	1	-	7/A0.1	6/A0.1	-	90	1,2,3,4,7,8,12
E02	2	3' - 0"	7' - 2"	ALUM.	FG	1" INSUL.	ALUM.	4	1" INSUL.	5/A2.1	6/A2.1	-	90	1,4,6,10,11
E03	2	3' - 0"	7' - 0"	H.M.	FG	1" INSUL.	H.M.	EXIST.	-	EXIST.	EXIST.	-	90	1,2,3,4,5,10,11
E04	2	EXIST.	EXIST.	H.M.	EXIST.	EXIST.	H.M.	EXIST.	-	EXIST.	EXIST.	-	EXIST.	6,10,11,13
E05	2	EXIST.	EXIST.	H.M.	EXIST.	EXIST.	H.M.	EXIST.	-	EXIST.	EXIST.	-	EXIST.	6,10,11,13
A101	1	3'-0"	7' - 0"	WD.	N	1/4" TEMP.	H.M.	1	-	8/A0.1	9/A0.1	-	90	9,11
A102	1	3'-0"	7' - 0"	WD.	N	1/4" TEMP.	H.M.	1	-	8/A0.1	9/A0.1	-	-	
A103	1	3'-0"	7' - 0"	WD.	HG	1/4" TEMP.	H.M.	3	45 MIN.	8/A0.1	9/A0.1 SIM.	-	90	4,9
A104	1	3'-0"	7' - 0"	WD.	F	-	H.M.	EXIST.	-	EXIST.	EXIST.	-	90	5,9
A105	1	3'-0"	7' - 0"	WD.	F	-	H.M.	EXIST.	-	EXIST.	EXIST.	-	90	5,9
A106	2	3'-0"	7' - 0"	WD.	HG	1/4" TEMP.	H.M.	1	-	8/A0.1	9/A0.1	-	90	9
A111	2	3'-0"	7' - 0"	WD.	HG	1/4" TEMP.	H.M.	EXIST.	-	EXIST.	EXIST.	-	90	4,9

DOOR SCHEDULE REMARKS:

1. WEATHERSTRIPPING.
2. GALVANIZED DOOR.
3. CLOSURE TRIM AT TOP OF HM DOOR.
4. PANIC DEVICE.
5. FIT DOOR AND HARDWARE TO EXISTING H.M. FRAME.
6. VIDEO INTERCOM AT 48" AFF.
7. KERFED H.M. FRAME TO RECEIVE WEATHERSTRIPPING.
8. NO EXTERIOR HANDLES.
9. KICK PLATE ON BOTH SIDES OF DOOR(S).
10. CARD READER IF PAIRED WITH VIDEO INTERCOM, MOUNT 2" BELOW VIDEO INTERCOM.
11. PROVIDE SAFETY AND SECURITY FILM TO DOOR GLAZING.
12. CONFIIRM FIT OF FRAME AND DOOR MATCHES MASONRY COURSING.
13. CLEAN AND PAINT EXISTING DOOR AND FRAME.

GENERAL DOOR AND FRAME NOTES:

GENERAL NOTES:

1. REFER TO TYPICAL THRESHOLD DETAILS, U.N.O
2. COORDINATE AND FIELD VERIFY DOOR AND FRAME INSTALLATIONS WITH ADJACENT MATERIALS AND OPENING DIMENSIONS. IDENTIFY CONFLICTS AND OBTAIN RESOLUTION PRIOR TO DOOR/FRAME FABRICATION.
3. LINTEL BEAM LENGTH SHALL BE M.O. PLUS 16" LONG (MIN. 8" BEARING AT EACH END U.N.O.). LINTEL PLATE LENGTH SHALL BE M.O. LESS 1/4" LONG (1/8" AT EACH END) REFER TO STRUCTURAL DRAWINGS FOR LINTEL INFORMATION.
4. RAKE ALL MORTAR JOINTS 1/2" AT EXTERIOR STEEL LINTEL BEARING LOCATIONS AND PROVIDE SEALANT TO MATCH MORTAR COLOR.
5. INSTALL ALL FRAME AND DOOR ASSEMBLIES IN FULL COMPLIANCE WITH FRAME AND DOOR MANUFACTURER PRINTED INSTALLATION GUIDELINES.
6. CONTRACTOR TO COORD. WORK WITH ASSOCIATED TRADES (FRAMING, MASONRY, ETC.) TO CONFIRM ALL DIMENSIONS AND ACCOUNT FOR SHIMS, DEFLECTION, ETC.
7. PAINT ALL EXPOSED STEEL LINTELS AT EXTERIOR WALLS BY CONTRACTOR. PAINTING OF ALL EXPOSED INTERIOR LINTELS IS BY OWNER U.N.O.
8. WHERE DOOR SWING CHANGES AND/OR OLD HARDWARE IS REMOVED, REPAIR FRAME TO RECEIVE PAINT BY OWNER.
9. PROVIDE CONCEALED STEEL REINFORCEMENT AS REQUIRED BY FABRICATOR TO ACCOMMODATE WIND LOADING, OTHER STRUCTURAL CONSIDERATIONS AND HARDWARE INSTALLATIONS, AND AS REQ'D. TO ACHIEVE INDICATED SYSTEM DEPTHS

GENERAL DOOR NOTES:

1. PROVIDE AND INSTALL ALL HARDWARE IN COMPLIANCE WITH THE APPLICABLE ARTICLES OF THE "AMERICANS WITH DISABILITIES ACT" (ADA) AND ANSI A117.1 - 2009
2. HARDWARE NOTED ON DOOR SCHEDULE IS CODE REQUIRED MINIMUMS. REFER TO HARDWARE SPECIFICATIONS FOR ADDITIONAL HARDWARE REQUIREMENTS SPECIFIC TO INDIVIDUAL DOORS.
3. UNDERCUT NON-RATED DOORS 1/2" MAXIMUM, FROM BOTTOM OF DOOR TO TOP OF FINISH FLOOR.
4. UNDERCUT EXTERIOR DOORS 1/8" MAXIMUM FROM BOTTOM OF DOOR TO TOP OF THRESHOLD.

HOLLOW METAL DOOR / FRAME NOTES:

1. PROVIDE 11 GA. X 2" WIDE STRAPS AT 8" O.C. IN H.M. FRAME HEADS GREATER THAN 2" IN HT.
2. GROUT FRAMES SOLID AT MASONRY WALLS, U.N.O.
3. PROVIDE A MINIMUM OF THREE JAMB ANCHORS, EACH JAMB, AT MASONRY WALLS, U.N.O.
4. ALL HOLLOW METAL FRAME DEPTHS ARE 5 3/4", UNLESS NOTED OTHERWISE.
5. PROVIDE BACKER ROD AND SEALANT AT ALL JOINTS WITH MINIMUM 3/8" SEALANT BEAD CONTINUOUS WHERE FRAME MEETS OTHER WALL MATERIALS.
6. PATCH HOLES WITHIN EXISTING H.M. FRAMES (BOTH SIDES) CLEAN AND PAINT. WITH SEALANT AT FULL PERIMETER (BOTH SIDES).
7. ADJUST DOOR HEIGHT AS NEEDED FOR NEW MASONRY OPENING TO ALIGN WITH EXISTING COURSING.

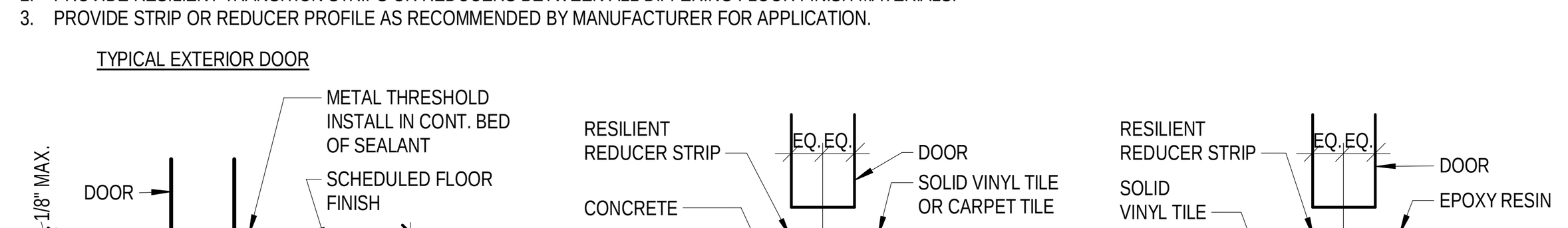
GLAZING NOTES:

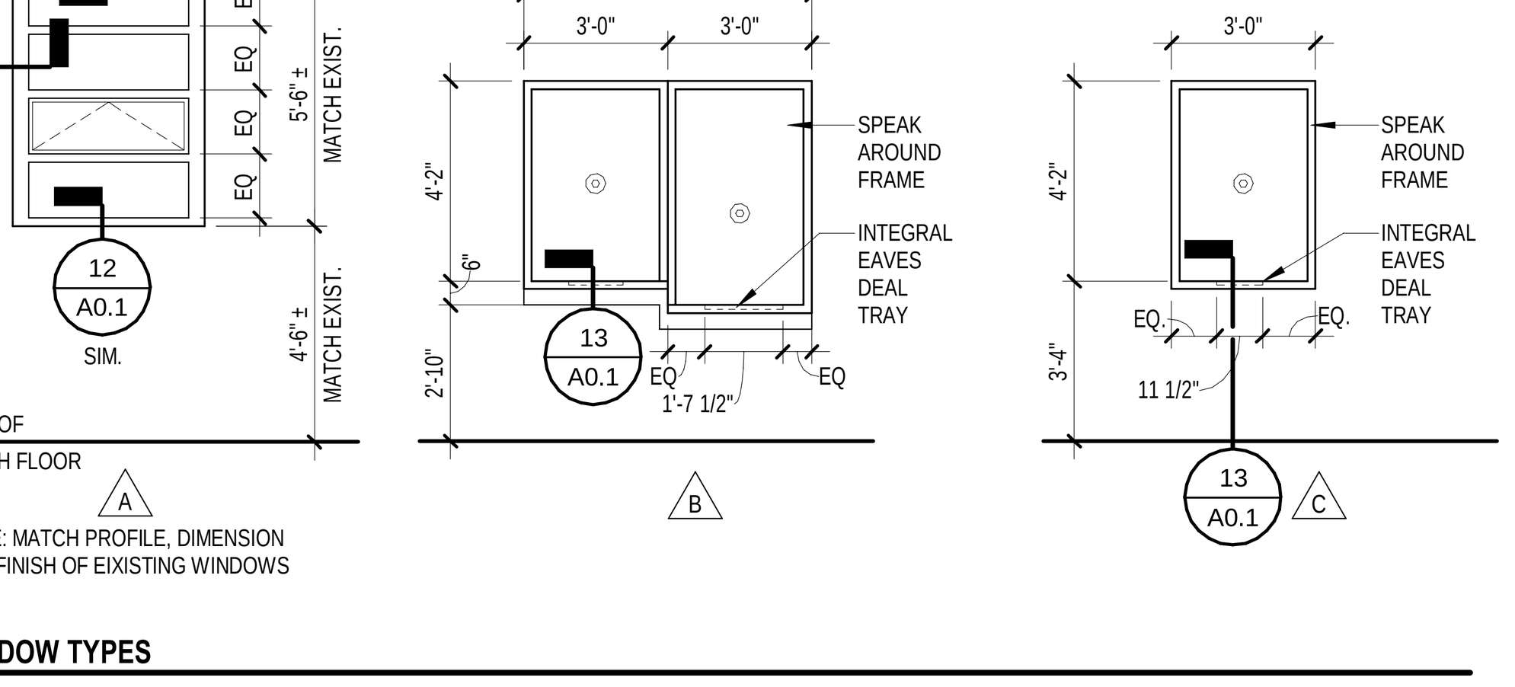
1. PROVIDE FULLY TEMPERED GLASS WHERE INDICATED ON SCHEDULE AND/OR SHOWN ON DOOR AND FRAME TYPES, OR AS REQUIRED BY CODE.
2. ALL EXTERIOR GLAZING IS 1" INSULATED, U.N.O.
3. ALL INTERIOR GLAZING IS 1/4", U.N.O.
4. ALL GLAZING AND GLAZING STOPS AT INTERIOR DOOR AND FRAME ASSEMBLIES TO BE INSTALLED ON THE SECURE SIDE OF THE ASSEMBLIES.
5. GLAZING LOCATIONS AND DIMENSIONS INDICATED ON DOOR TYPES IS TO THE EDGE OF THE VISIBLE GLAZING.
6. WHERE GLAZING IS SHOWN, THE FRAME FABRICATOR SHALL PRE-DRILL STOPS AND FRAME TO RECEIVE MOUNTING SCREWS. VERIFY LOCATIONS AND DEPTH OF GLAZING MATERIAL.

TYPICAL THRESHOLD CONDITIONS

GENERAL THRESHOLD NOTES:

1. REFER TO ROOM FINISH GROUPS AND FLOOR PLANS FOR FINISHES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE PROPER THRESHOLD IS USED.
2. PROVIDE RESILIENT TRANSITION STRIPS OR REDUCERS BETWEEN ALL DIFFERING FLOOR FINISH MATERIALS.
3. PROVIDE STRIP OR REDUCER PROFILE AS RECOMMENDED BY MANUFACTURER FOR APPLICATION.



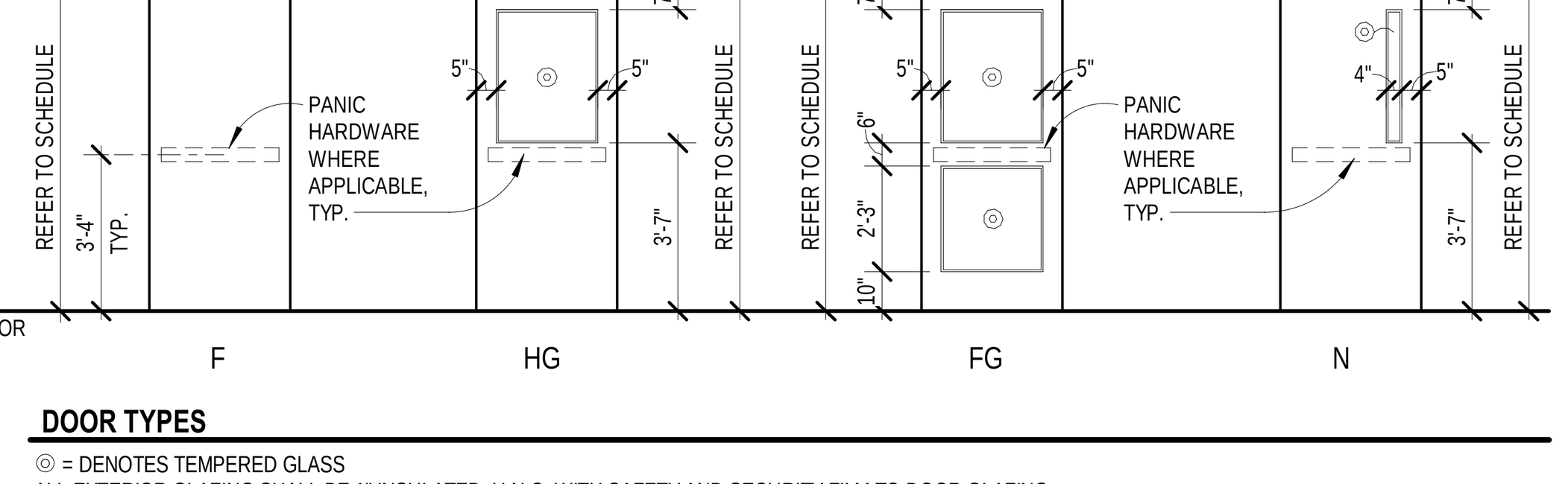


NOTE: MATCH PROFILE, DIMENSION AND FINISH OF EIXISTING WINDOWS

WINDOW TYPES

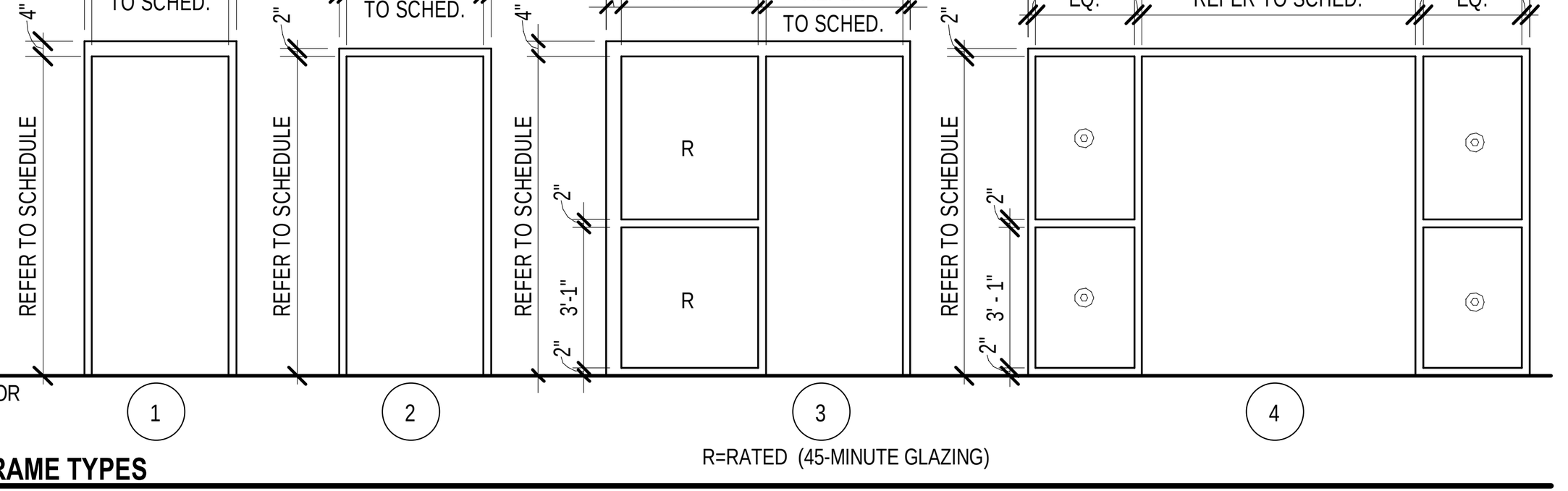
FOR TYPE "A" MATCH EXISTING DIMENSIONS/ PROFILE/ OPERATION/ FINISH AS EXISTING WINDOWS ALL EXTERIOR GLAZING SHALL BE 1" INSULATED, U.N.O

◎ = DENOTES TEMPERED GLASS FOR TYPES "B" & "C" SAFETY AND SECURITY FILM



DOOR TYPES

◎ = DENOTES TEMPERED GLASS
ALL EXTERIOR GLAZING SHALL BE 1" INSULATED, U.N.O. WITH SAFETY AND SECURITY FILM TO DOOR GLAZING



R=RATED (45-MINUTE GLAZING)

DOOR FRAME TYPES

◎ = DENOTES TEMPERED GLASS
ALL EXTERIOR GLAZING SHALL BE 1" INSULATED, U.N.O. WITH SAFETY AND SECURITY FILM TO DOOR GLAZING

ABBREVIATIONS

A	
@	At
AB	Anchor Bolt
&	And
A/C	Air Conditioning
ACOUS	Acoustical
ACT	Actual
ADA	Americans with Disabilities Act
ADJ	Adjust, Adjustable
ADH	Adhesive
AFF	Above Finish Floor
AGG	Aggregate
AHU	Air Handling Unit
ALUM	Aluminum
ANCH	Anchor
AP	Access Panel
APPROX	Approximate
ASSY	Assembly
AUTO	Automatic
B	
BD	Board
BTWN	Between
BEV	Beveled
BIT	Bituminous
BLK	Block
BLKG	Blocking
BM	Beam, Bench Mark
B.O.	Bottom of
BOT or BTM	Bottom
BUR	Built Up Roofing
C	
CAB	Cabinet
CB	Catch Basin, Chalkboard
C/C	Center to Center (Same meaning as OC)
CEM	Cement
CER	Ceramic
CF	Cubic Feet
CFI	Contractor Furnished and Installed
CHAN	Channel
CI	Cast Iron
CJ	Control Joint
CLG	Ceiling
CLOS	Closet
CLR	Clear
CMU	Concrete Masonry Unit
COL	Column
CONC	Concrete
COND	Condition, Condenser, Condensate
CONST	Construction
CONT	Continuous
CONTR	Contractor
CORRUG	Corrugated
CR	Cold Rolled
CSG	Casing
CTSK	Countersink
CU	Cubic
CULV	Culvert
CW	Cold Water, Clockwise
CY	Cubic Yard
D	
DBL	Double
DEP	Depressed
DET	Detail
DF	Drinking Fountain
DIA	Diameter
DIM	Dimension
DN	Down
DO	Ditto
DS	Downspout
DWG(S)	Drawing(s)
E	
EA	Each
EJ	Expansion Joint
EL or ELEV	Elevation
ELEC	Electric, Electrical
EMER	Emergency
ENCL	Enclosure
ENT	Entrance
EQ	Equal
EQUIV	Equivalent
ESMT	Easement
EW	Each Way
EWC	Electric Water Cooler (see mech dwgs)
EXIST	Existing
EXP	Expansion
EXT	Exterior
F	
FAB	Fabricate
FC	Fire Code
FD	Floor Drain (see mech dwgs)
FDN	Foundation
FE	Fire Extinguisher
FEC	Fire Extinguisher Cabinet
FFE	Finished Floor Elevation
FH	Flat Head
FIN	Finish, Finished
FL	Floor
FLASH	Flashing
FLEX	Flexible
FRT	Fire Retardant Treated
FTG	Footing
FURR	Furring
FV	Field Verify
G	
GA	Gauge
GALV	Galvanized
GB	Grab Bar
GEN	Generator
GF CMU	Ground Face Conc. Mas. Unit
GI	Galvanized Iron
GFI	Ground Fault Interrupt
GL	Glass, Glazing
GLUE LAM	Glue-Laminated
GND	Ground
GR	Grade
GST	Glazed Structural Tile
GYP	Gypsum
H	
H	High
HARD	Hardened
HB	Hose Bib
HC	Hollow Core
HD BD	Hard Board
HC	Handicapped
HDR	Header
HDWE	Hardware
HD WD	Hardwood
HEX	Hexagonal
HT	Height
HOL	Hollow
HM	Hollow Metal
HORIZ	Horizontal
HP	Horsepower
HTG	Heating
HTR	Heater
HW	Hot Water, Hard White
I	
ID	Inside Diameter
IF	Inside Face
INCL	Included
INSUL	Insulation
INT	Interior
INV	Invert
J	
JB	Junction Box
JST	Joist
JT	Joint
K	
KBC	Kentucky Building Code
L	
L	Angle, Long
LAM	Laminate
LF	Light Fixture, Linear Feet
LH	Left Hand
LLV	Long Leg Vertical
LOC	Location
LT	Light
LTWT	Lightweight
M	
MAS	Masonry
MATL	Material
MAX	Maximum
MB	Marker Board
MC	Miscellaneous Channel
MDO	Medium Density Overlay
MECH	Mechanical
MED	Medium, Medicine
MTL	Metal
MFR	Manufacturer
MH	Manhole
MIN	Minimum, Minute
MISC	Miscellaneous
ML & P	Metal Lath and Plaster
MO	Masonry Opening
MT	Marble Threshold
MTD	Mounted
MTG	Mounting
MULL	Mullion
N	
NA	Not Applicable
NET	Means Exact Dimension Required
NIC	Not in Contract
NO. or #	Number
NOM	Nominal
NTS	Not to Scale
O	
OC	On Center
OD	Outside Diameter
OF	Outside Face
OFOI	Owner Furnished and Installed
OF-CI	Owner Furnished, Contractor Installed
OH	Overhead
OPNG	Opening
OPP	Opposite
P	
PART	Partition
PART BD	Particle Board
PASS	Passage
PC	Precast
P/C	Poured Concrete
PEMB	Pre-Engineered Metal Building
PERF	Perforated
PERIM	Perimeter
PERP	Perpendicular
PF CMU	Prefaced Conc. Mas. Unit
PH	Phase
PLAS	Plaster
PLUMB	Plumbing
PLYWD	Plywood
POL	Polished
POLY CARB	Polycarbonate Sheet
PREFAB	Prefabricated
PROJ	Project, Projected
PR	Pair
PSMB	Pencil Sharpener Block
PT	Point, Pressure Treated
PVC	Polyvinyl Chloride
PVMT	Pavement
PWG	Polished Wire Glass
±	Plus or Minus
Q	
QT	Quarry Tile
R	
R	Riser, Radius
R or RAD	Radius
RCP	Reinforced Concrete Pipe
RD	Roof Drain
REBAR	Reinforcing Bar
RECIRC	Recirculate
REF	Reference, Refer
REFR	Refrigerator
REINF	Reinforce, Reinforced, Reinforcing
REQD	Required
RET	Retaining, Return
RESIL	Resilient
RH	Right Hand, Round Head
RO	Rough Opening
ROW or R/W	Right of Way
S	
SC	Solid Core
SCHD	Schedule
SECT	Section
SEP	Separate, Separation
SF	Square Feet, Split Face
SHEATH	Sheathing
SHT	Sheet
SIM	Similar
S.M.	Shaped Metal
SPA	Space(s)
SPEC	Specifications
SPM	Single-ply Membrane
SQ	Square
SS	Stainless Steel
STA	Station
STD	Standard
STL	Steel
STOR	Storage
STRUCT	Structural
SUSP	Suspended
SYMM	Symmetrical
T	
T	Tread, Thick
TB	Tackboard
TC	Top of Curb
TCE	Top of Curb Elevation
TDS	Turned Down Slab
TEL	Telephone
TFE	Top of Footing Elevation
T & G	Tongue and Groove
THK	Thick, Thickness
THRESH	Threshold
T.O.	Top of
TOC	Top of Concrete
TOIL	Toilet
TOS	Top of Steel
TS	Tack Strip, Structural Steel Tubing
TOW	Top of Wall
TYP	Typical
U	
UG	Underground
UL	Underwriters Laboratory
UNFIN	Unfinished
UNO	Unless Noted Otherwise
V	
VAC	Vacuum
VB	Vapor Barrier
VCT	Vinyl Composition Tile
Vert	Vertical
VIF	Verify in Field
W	
W	Wide
WWF	Welded Wire Fabric
X	
X	By
Y	
YD	Yard

ROOM FINISH GROUPS

GENERAL NOTES:

1. REFER TO SHEET A0.1 FOR TYPICAL THRESHOLD CONDITIONS.
2. IN CORRIDORS AND ROOMS WITH SUSP. ACOUST. CEILINGS, ALL EXPOSED PEMB COLUMN SHALL BE PAINTED AN ACCENT COLOR.

XXX RFG 1
FLOOR: EXISTING TO REMAIN. PROTECT.
BASE: EXISTING TO REMAIN. PROTECT.
WALLS: PAINT NEW JAMB AND ADJACENT WALLS TO NEAREST INSIDE CORNERS
CEILING: EXISTING TO REMAIN. PROTECT.

XXX RFG 2
FLOOR: PATCH FLOORING TO MATCH EXISTING AT NEW WALLS AND OPENING
BASE: PATCH BASE TO MATCH EXISTING AT NEW WALLS AND OPENING
WALLS: PAINT.
CEILING: EXISTING TO REMAIN, MODIFY AT NEW WALL AS NEEDED.

XXX RFG 3
FLOOR: RESINOUS
BASE: 6" RESINOUS
WALLS: PAINT
CEILING: 2x2 VINYL FACED ACOUSTICAL CEILING TILE

XXX RFG 4
FLOOR: LUXURY VINYL TILE
BASE: 4" VINYL
WALLS: PAINT
CEILING: 2x2 ACOUSTICAL CEILING TILE

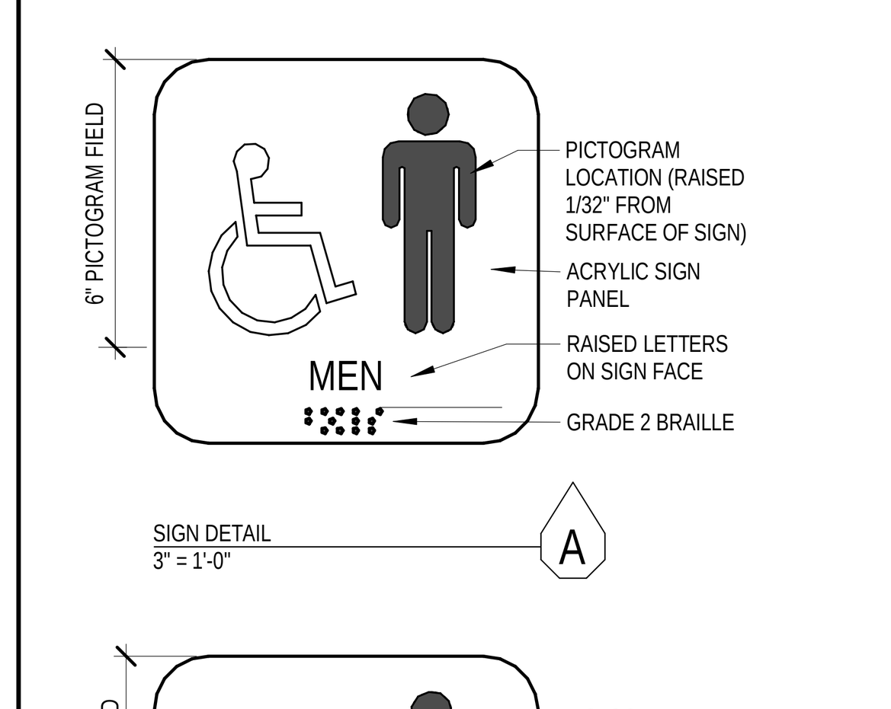
XXX RFG 5
FLOOR: PATCH FLOORING TO MATCH EXISTING AT NEW WALLS AND OPENING
BASE: PATCH FLOORING TO MATCH EXISTING AT NEW WALLS AND OPENING
WALLS: PAINT
CEILING: EXISTING TO REMAIN, MODIFY AT NEW WALLS AS NEEDED

XXX RFG 6
FLOOR: PATCH FLOORING TO MATCH EXISTING AT NEW WALLS AND OPENING
BASE: PATCH FLOORING TO MATCH EXISTING AT NEW WALLS AND OPENING
WALLS: PAINT
CEILING: 2x2 ACOUSTICAL CEILING TILE

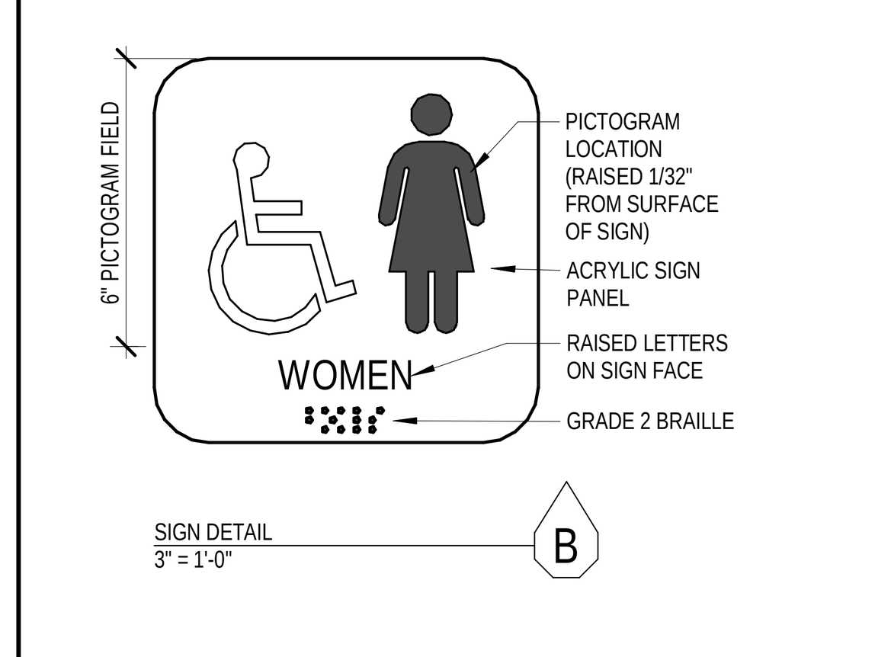
GENERAL SIGNAGE NOTES

1. CHARACTERS SHOWN ON THIS SHEET ARE COMPUTER GENERATED SPACING OF CHARACTERS IS NOT ACCURATE. CORRECT "VISUAL" SPACING IS THE RESPONSIBILITY OF THE MANUFACTURER.
2. PICTOGRAMS ARE SHOWN HEREIN FOR INFORMATION AND INTENT ONLY. MECHANICAL, CAMERA- READY ARTWORK SHALL BE SUPPLIED BY THE SIGNAGE CONTRACTOR.
3. COLORS OF PANEL SIGNS TO BE SELECTED BY ARCHITECT.
4. UNLESS OTHERWISE NOTED, ALL SIGNS TO BE MOUNTED BESIDE DOORS AT 5'-0" A.F.F. TO CENTER OF SIGN AND 2" FROM EDGE OF DOOR FRAME ON THE STRIKE SIDE. THE ARCHITECT SHALL BE CONSULTED BEFORE PLACEMENT OF SIGNAGE FOR LEFTHAND AND RIGHTHAND ORIENTATION OF SIGNS.
5. UNLESS OTHERWISE NOTED, ALL SIGNS TO BE MOUNTED UNDER WINDOW OR SIDELITES SHALL BE MOUNTED 2 FROM BOTTOM OF SILL TO TOP EDGE OF SIGN AND CENTERED ON THE WINDOW.
6. ON SIGN DETAILS = THREE CHARACTER NUMBER TO BE SUPPLIED BY ARCHITECT.
7. ALL SIGNAGE SHALL MEET REQUIREMENTS FOR ADAAG OF THE AMERICANS WITH DISABILITIES ACT (ADA).
8. MESSAGE (COPY) TO BE DETERMINED BY ARCHITECT/OWNER.
9. ALL PANEL SIGNS TO BE 8"x8".
10. NOTE. ROOM NAMES AND NUMBERS SHOWN HERE ARE FOR CONSTRUCTION PURPOSES ONLY. FINAL ROOM NAMING AND NUMBERING FOR SIGNAGE SHALL BE PROVIDED BY OWNER.
11. ALL SIGNAGE SHOWN MOUNTED ON ALUM STOREFRONT FRAMES TO BE FULLY ADHERED TO THE GLASS 5-0 A.F.F. WITH FINISHED BACK PANEL.

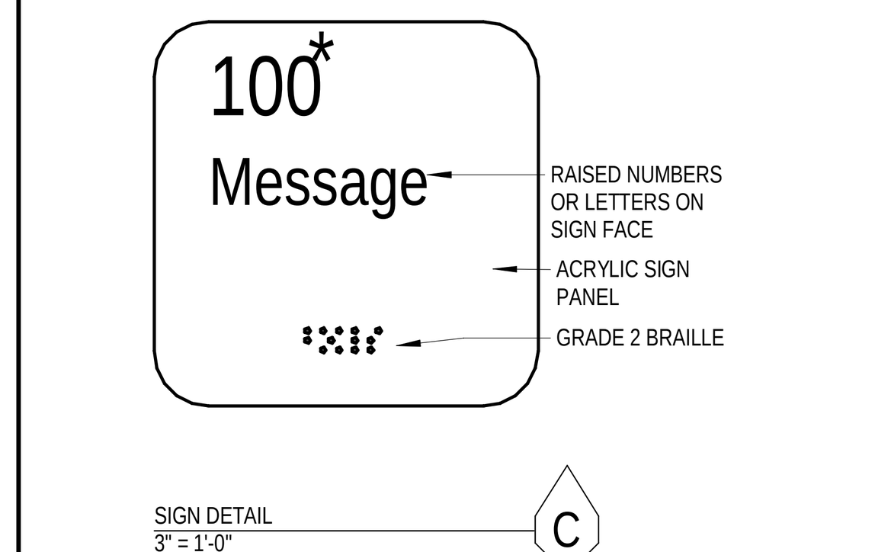
SIGNAGE



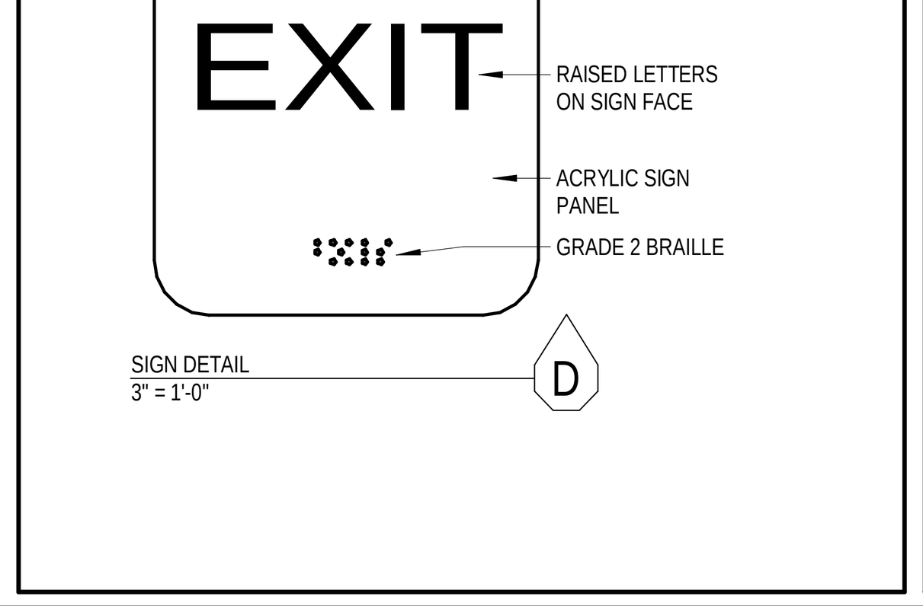
SIGN DETAIL
3" = 1'-0"



SIGN DETAIL
3" = 1'-0"



SIGN DETAIL
3" = 1'-0"



SIGN DETAIL
3" = 1'-0"

LEGEND

Symbol	Description
# RFG #	ROOM FINISH GROUP, REFER TO SHEETS A0.1 & A1.1
	ROOM NUMBER
# (circle)	DOOR NUMBER, REFER DOOR SCHEDULE. REFER TO SHEETS A0.1 & A1.1
X (diamond)	NEW WORK KEY NOTES, REFER TO FLOOR PLANS
X (square)	WALL TYPE, REFER TO WALL PARTITION SCHEDULE
X (triangle)	FRAME TYPE, REFER TO FRAME ELEVATIONS
X (hexagon)	TOILET ACCESSORIES, REFER TO PLANS
X	ELEVATION KEY NOTE, REFER TO BUILDING ELEVATIONS
X	SIGNAGE TYPE, REFER TO SIGNAGE TYPES
	ELEVATION MARK
FEC	FIRE EXTINGUISHER AND CABINET. MOUNT TOP OF HANDLE AT 54" A.F.F.
X	FB1 - 1 HOUR FIRE BARRIER EFB1 - EXISTING 1 HOUR FIRE BARRIER
X / X-X	DETAIL OR ENLARGED PLAN
X / X-X	EXTERIOR OR INTERIOR ELEVATIONS

GENERAL NOTES

G1 (NIC) MEANS NOT IN CONTRACT. TO BE PROVIDED BY OWNER AND INSTALLED BY OWNER. (OFCI) MEANS OWNER FURNISHED, CONTRACTOR INSTALLED

G2 DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALED DIMENSIONS.

G3 ALL DIMENSIONS SHOWN ARE TO FACE OF MASONRY, METAL STUDS OR COLUMN LINES OF STRUCTURE. MASONRY DIMENSIONS ARE NOMINAL. EXTERIOR WALL DIMENSIONS ARE TO FACE OF BLDG. LINE.

G4 PROVIDE BULLNOSE UNITS AT ALL EXPOSED CONCRETE BLOCK CORNERS, UNLESS OTHERWISE NOTED.

G5 ALL CONCEALED WOOD BLOCKING, NAILERS AND PLYWOOD SHALL BE FIRE—RETARDANT TREATED (F.R.T.) WHERE BLOCKING IS INDICATED OR REQ'D. WOOD TRIM, INTERIOR ARCHITECTURAL WOODWORK, CASEWORK AND MILLWORK IS NOT REQUIRED TO BE F.R.T. ALL EXTERIOR WOOD FRAMING AND BLOCKING SHALL BE PRESSURE PRESERVATIVE TREATED. ALL CONCEALED INTERIOR WOOD FRAMING AND BLOCKING SHALL BE FIRE RETARDANT WOOD TREATED.

G6 ALL WOOD BLOCKING IN CONTACT WITH CONCRETE OR CMU SHALL BE PRESSURE TREATED.

G7 REFER TO STRUCTURAL DRAWINGS FOR TYPES, SIZE, LOCATION, CONNECTIONS, REINFORCEMENT AND OTHER REQUIREMENTS PERTAINING TO STRUCTURAL COMPONENTS INDICATED.

G8 REFER TO STRUCTURAL DRAWING FOR LINTEL INFORMATION.

G9 REFER TO STRUCTURAL DRAWINGS FOR REINFORCING IN CMU WALLS, POURED CONCRETE SLABS AND FOUNDATIONS.

G10 ALL CHANGES IN FLOOR FINISHES SHALL OCCUR AT DOOR THRESHOLDS - TYPICAL.

G11 CONTACT BETWEEN DISSIMILAR METALS SHALL BE SEPARATED WITH BUTYL TAPE OR OTHER MEANS TO PREVENT GALVANIC CORROSION.

G12 CONTRACTOR SHALL PROVIDE ALL CONCEALED BLOCKING REQUIRED FOR ATTACHMENT AND SUPPORT OF EQUIPMENT, FIXTURES, WINDOWS, ETC. IN CONTRACT.

G13 ALL EXPOSED CORNERS AND EDGES OF GYPSUM BOARD SHALL BE FINISHED WITH CORNER BEAD OR LC-BEAD, RESPECTIVELY AND WALL PROTECTION COVER. REFER TO SPECS.

G14 PARTITIONS TYPES ARE TO MAINTAIN THEIR RESPECTIVE SEPARATION/ RATING (IF ANY) FULL HEIGHT. ALL HVAC, ELECTRICAL, PLUMBING PENETRATIONS ARE TO BE SEALED/ SAFED/ DAMPERED TO COMPLY WITH LOCAL CODES.

G15 CONTRACTOR SHALL VERIFY ALL ROUGH OPENING SIZES FOR FRAMES AND OPENINGS AND COORDINATE ANY REQUIRED ADJUSTMENTS WITH THE ARCHITECT.

GENERAL PARTITION TYPE NOTES

P1 PARTITION TYPE, REFER TO SCHEDULE, THIS SHEET. ALL INTERIOR CMU WALLS TO BE EXTENDED FULL HEIGHT TO UNDERSIDE OF ROOF DECK OR FLOOR ABOVE.

ALL INTERIOR MTL. STUD PARTITIONS SHALL EXTEND TO 8" ABOVE CEILING ASSEMBLY.

P2 INTERIOR PARTITION TYPES ARE IDENTIFIED BY NUMBER AND EXTERIOR WALL ASSEMBLY TYPES BY LETTER.

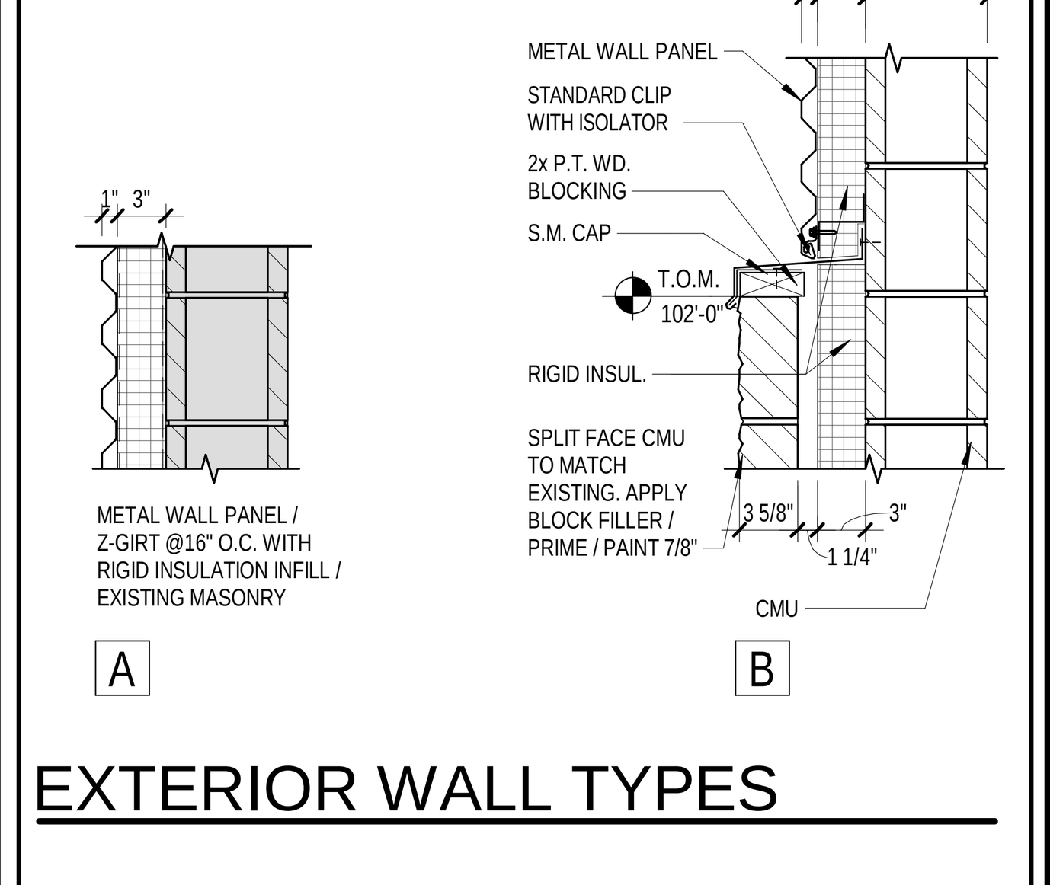
P3 ALL DIMENSIONS SHOWN ARE TO FACE OF MASONRY, METAL STUDS OR STRUCTURE (BUILDING LINE). MASONRY DIMENSIONS ARE NOMINAL.

P4 PAINT ALL NEW INTERIOR GYPSUM BOARD EXPOSED TO VIEW

P5 REFER TO ROOM FINISH GROUPS FOR WALL BASE CONDITION.

P6 ALL NEW MASONRY EXPOSED TO VIEW SHALL BE PRIMED AND PAINTED.

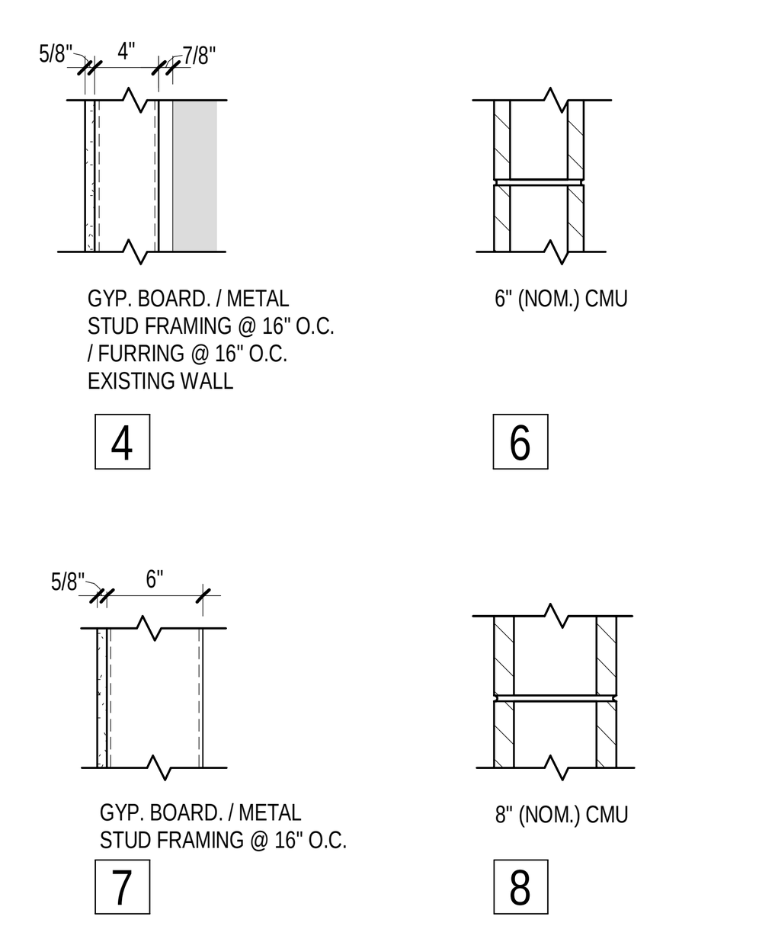
WALL / PARTITION SCHEDULE



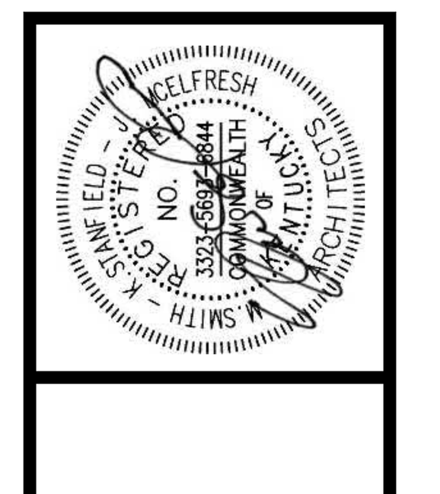
EXTERIOR WALL TYPES

NOTE: EXTEND TO WITHIN 1" OF HORIZONTAL ASSEMBLY HA1 ABOVE

NOTE: EXTEND TO WITHIN 1" OF HORIZONTAL ASSEMBLY HA1 ABOVE



INTERIOR WALL TYPES



SHERMAN CARTER BARNHART ARCHITECTS

SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION

110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

ABBREVIATIONS, SYMBOL LEGEND, GENERAL NOTES AND INFORMATION, PARTITION TYPES, CODE INFORMATION AND SIGNAGE

JOB NO.	2448
DATE	02 • 26 • 25
DRAWN	CTM
CHECKED	TSS

REVISIONS

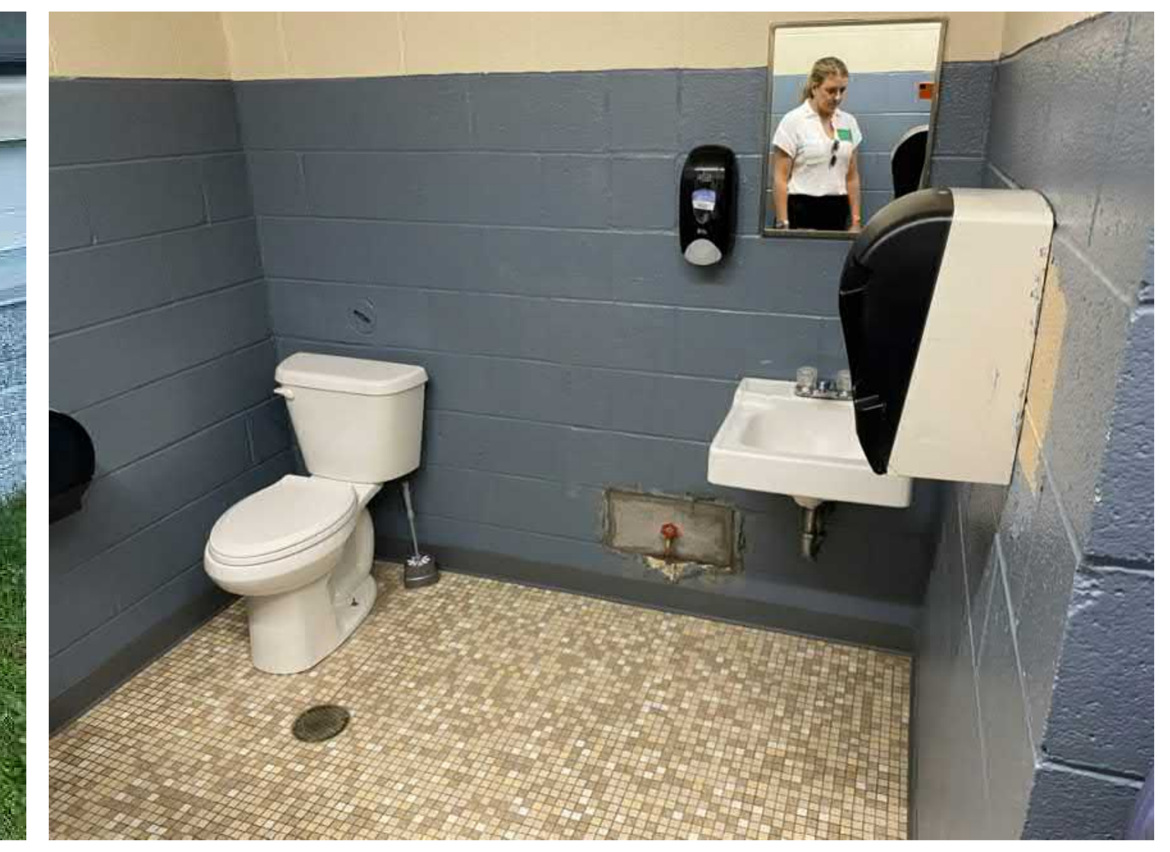
No.	Description	Date

SHEET
A0.1

P1 REFERINCE IMAGE N.T.S. — BOARD OFFICE AT PARKING LOT

P2 REFERINCE IMAGE N.T.S. — BOARD OFFICE AT PARKING LOT

P3 REFERINCE IMAGE N.T.S. — BOARD OFFICE CORNER



P4 REFERINCE IMAGE N.T.S. — BOARD OFFICE MEN'S ROOM

P5 REFERINCE IMAGE N.T.S. — BOARD OFFICE CANTILEVERED ROOF AT REASOR AVENUE

P6 REFERINCE IMAGE N.T.S. — BOARD OFFICE WOMEN'S ROOM

P7 REFERINCE IMAGE N.T.S. — BOARD OFFICE EXTERIOR

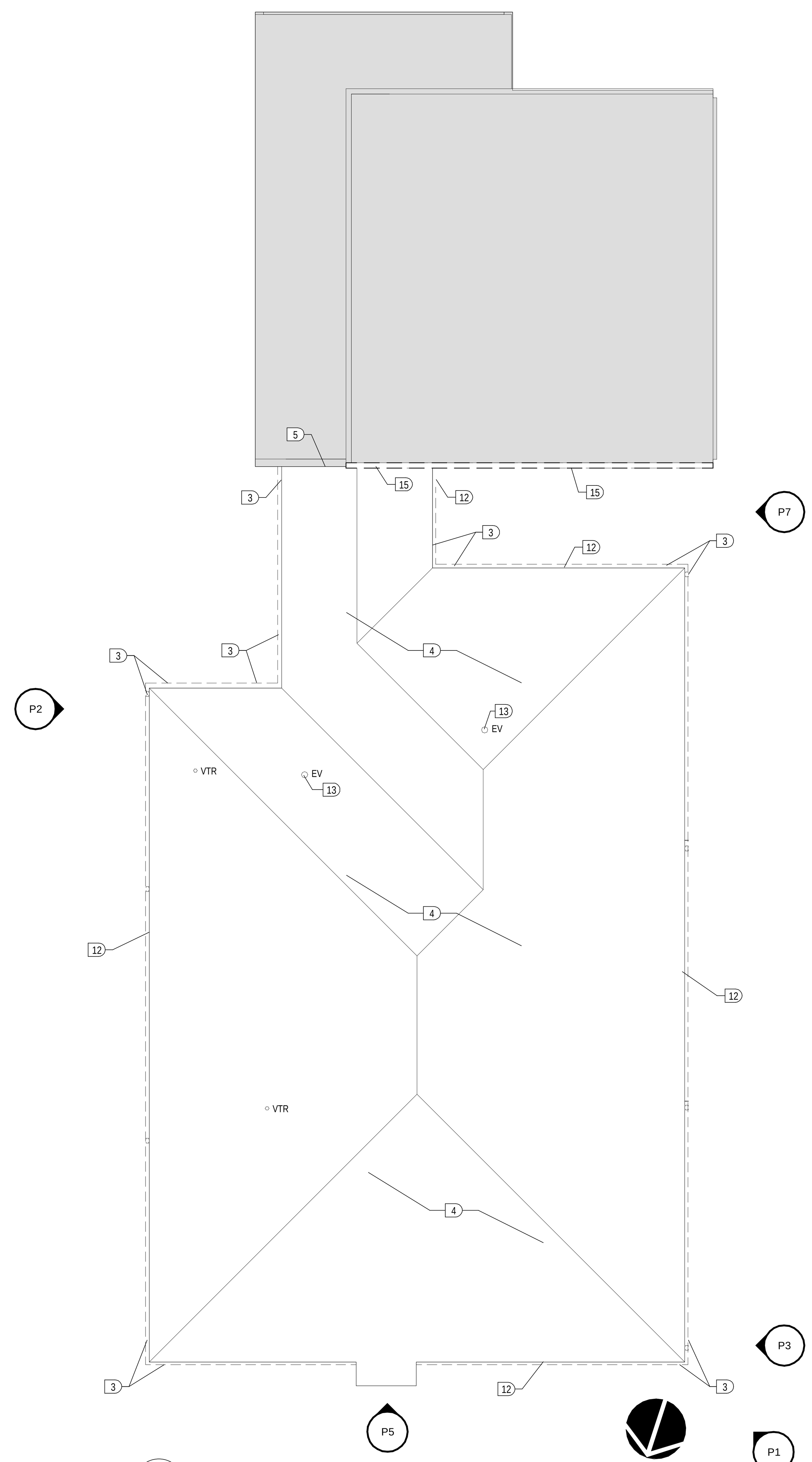
DEMOLITION KEYNOTES

1. REMOVE PORTION OF EXISTING WALL FOR NEW OPENING SHORE AS NEEDED. TOOTH IN NEW CMU AND FACE BRICK (SALVAGED) AT JAMBS AS REQUIRED.
2. REMOVE EXISTING DOOR AND RELATED HARDWARE. PROTECT H.M. FRAME. PREP AS REQUIRED FOR NEW DOOR HARDWARE, AND PAINT.
3. REMOVE EXISTING GUTTER, DOWNSPOUTS, SPLASHBLOCKS AND TRIM.
4. REMOVE EXISTING ROOFING SHINGLES, UNDERLAYMENT, FASTENERS AND TRIM TO DECK. PROTECT ROOF DECK TO REMAIN.
5. REMOVE FLASHING ABUTTING INTO ADJACENT MASONRY TO REMAIN. PROTECT.
6. REMOVE EXISTING SUSPENDED ACOUSTICAL CEILING SYSTEM. PROTECT ADJACENT. CONSTRUCT AS REQUIRED.
7. REMOVE EXISTING CMU FOR NEW CONSTRUCTION. SHORE AS NEEDED, TOOTH IN NEW WORK.
8. REMOVE EXISTING TOILET PARTITIONS AND ACCESSORIES. REFER TO PLUMBING.
9. REMOVE EXISTING BASE AND FLOORING TO SLAB BELOW. PREP SLAB AS REQUIRED FOR NEW FINISHES.
10. REMOVE EXISTING DIMENSIONAL LETTERS FROM WALL.
11. RAKE/ REMOVE EXISTING SEALANT FROM EXTERIOR DOOR AND WINDOW PERIMETER. PROTECT ADJACENT. PREPARE FOR NEW WORK AS REQUIRED.
12. REMOVE EXISTING SOFFIT BELOW ROOF EAVE TYP.
13. REMOVE AND RE-INSTALL EXHAUST VENTS. FLASH AS REQUIRED PER NEW ROOF WARRANTY REQUIREMENTS. LOCATIONS AND COUNT APPROXIMATE.
14. SALVAGE AND REINSTALL TOILET ACCESSORIES THAT ARE TO BE REUSED. REFER TO NEW WORK, COORDINATE WITH OWNER.
15. REMOVE EXISTING FRAMED PARAPET ATOP MASONRY PARAPET BELOW. INCLUDING COPING / FASCIA AND SHEATHING. PROTECT MASONRY PARAPET AND ROOFING.
16. SELECTIVELY REMOVE FLOORING AND BASE FOR NEW CONSTRUCTION.
17. SELECTIVELY REMOVE FACE BRICK FOR INSTALLATION OF SEMI. RECESSED KNOX BOX. PROTECT ADJACENT.
18. REMOVE CEILING ASSEMBLY. PROTECT ADJACENT.
19. REMOVE EXISTING TOILET STALL PARTITIONS.
20. REMOVE EXISTING PARTITION. PROTECT ADJACENT.
21. EXISTING EXTERIOR CEILING TO REMAIN. PROTECT.
22. REMOVE TRIM FROM EXISTING OVERHANG AS REQUIRED FOR NEW CONSTRUCTION.
23. REMOVE AND REINSTALL EXISTING SUSPENDED ACOUSTICAL CEILING SYSTEM AS NECESSARY FOR NEW CONSTRUCTION. REFER TO MECHANICAL.

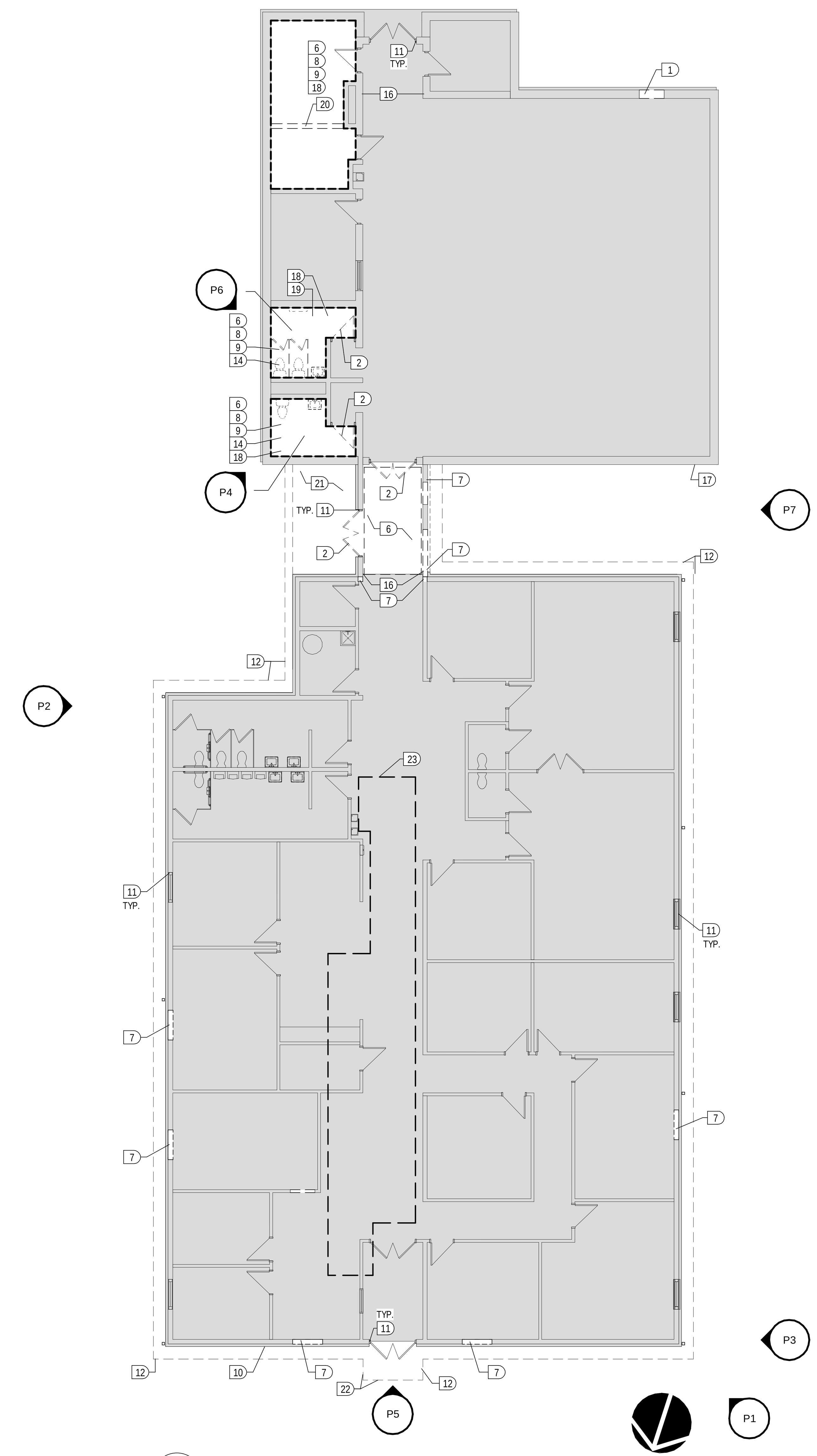
SALVAGE NOTE

A. REMOVE, SALVAGE PACKAGE AND DELIVER ALL VIDEO INTERCOM SYSTEMS AT EXTERIOR DOORS TO OWNER.

B. REMOVE, SALVAGE AND REUSE EXISTING FACE BRICK AT AREA OF REMOVAL FOR NEW DOOR OPENING AND KNOX BOX KEY VAULT INSTALLATION. REFER TO DEMOLITION KEYNOTES 1 AND 17.



2 ROOF PLAN - DEMOLITION
3/32" = 1'-0"



1 FLOOR PLAN - DEMOLITION
3/32" = 1'-0"

HAZARDOUS MATERIAL NOTES

DUE TO THE AGE OF THE EXISTING BUILDINGS, IT IS POSSIBLE HAZARDOUS MATERIALS OR TOXIC SUBSTANCES / MOLDS MAY EXIST. THIS INCLUDES BUT IS NOT LIMITED TO ASBESTOS PRODUCTS, POLYCHLORINATED BIPHENYL (PCB), AND OTHER TOXIC SUBSTANCES. IF ANY WORK PERSON ENCOUNTERS ANY MATERIAL OR SUBSTANCE WHICH THEY SUSPECT MIGHT BE HAZARDOUS OR TOXIC, THEY SHALL IMMEDIATELY ADVISE THE OWNER. THE CONTRACTOR SHALL TAKE IMMEDIATE AND APPROPRIATE ACTION TO PROTECT THE BUILDING USERS AND WORKERS IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL LAWS, CODES AND REGULATIONS. THE ARCHITECT AND ARCHITECT'S CONSULTANTS SHALL HAVE NO RESPONSIBILITY FOR THE DISCOVERY, PRESENCE, HANDLING, REMOVAL OR DISPOSAL OF OR EXPOSURE OF PERSONS TO HAZARDOUS MATERIALS OR TOXIC SUBSTANCES IN ANY FORM AT THE PROJECT SITE, INCLUDING BUT NOT LIMITED TO ASBESTOS, ASBESTOS PRODUCTS, POLYCHLORINATED BIPHENYL (PCB), OTHER TOXIC SUBSTANCES, OR TOXIC MOLDS.

1. THE CONTRACTOR IS HEREBY ADVISED THAT SHERMAN-CARTER-BARNHART, PLLC IS NOT A DESIGN PROFESSIONAL IN THE DETERMINATION OF THE PRESENCE OF HAZARDOUS MATERIALS, NOR IS SHERMAN-CARTER-BARNHART, PLLC DESIGN PROFESSIONAL INVOLVED IN MAKING RECOMMENDATIONS REGARDING THE TESTING, REMOVAL, ENCAPSULATION OR OTHER CORRECTIVE MEASURES PERTAINING TO HAZARDOUS MATERIALS OR TOXIC MOLDS / SUBSTANCES.
2. IF THE WORK WHICH IS TO BE PERFORMED UNDER THE CONTRACT INTERFACES IN ANY WAY WITH THE EXISTING COMPONENTS WHICH CONTAIN HAZARDOUS MATERIALS OR TOXIC SUBSTANCES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNER'S ENVIRONMENTAL CONSULTANT REGARDING THE PROPER MEANS AND METHODS TO BE UTILIZED IN DEALING WITH HAZARDOUS MATERIALS AND SUBSTANCES.
3. BY EXECUTION OF THE CONTRACT FOR CONSTRUCTION, THE CONTRACTOR HEREBY AGREES TO BRING NO CLAIM FOR NEGLIGENCE, BREACH OF CONTRACT, INDEMNITY OR OTHERWISE AGAINST THE ARCHITECT, HIS PRINCIPALS, EMPLOYEES, AGENTS OR CONSULTANTS IF SUCH A CLAIM IN ANY WAY WOULD INVOLVE THE INVESTIGATION OF OR REMEDIAL WORK RELATED TO HAZARDOUS MATERIALS OR TOXIC SUBSTANCES IN THE PROJECT.
4. BY EXECUTION OF THE CONTRACT FOR CONSTRUCTION, THE CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD THE ARCHITECT, HIS PRINCIPALS, EMPLOYEES, AGENTS AND CONSULTANTS HARMLESS FROM ANY SUCH ASBESTOS, OTHER HAZARDOUS MATERIALS, OR TOXIC SUBSTANCES / MOLD RELATED CLAIMS THAT MAY BE BROUGHT BY THE CONTRACTOR'S SUBCONTRACTORS, SUPPLIERS OR OTHER THIRD PARTIES WHO MAY BE ACTING UNDER THE DIRECTION OF THE CONTRACTOR PURSUANT TO THIS PROJECT.

GENERAL DEMOLITION NOTES

1. DEMOLITION NOTES FOR THIS PROJECT ARE INTENDED TO GENERALLY IDENTIFY THE REMOVAL OF EXISTING ITEMS AT LOCATIONS WHERE REQUIRED BUT, SHALL IN NO WAY RELIEVE THE CONTRACTOR OF THE FULL RESPONSIBILITY FOR FIELD EXAMINING AND VERIFYING THE FULL EXTENT OF EXISTING CONDITIONS PRIOR TO BIDDING THIS PROJECT. ANY MECHANICAL AND ELECTRICAL ITEMS INDICATED ON ARCHITECTURAL SHEETS ARE INTENDED TO ASSIST WITH THE IDENTIFICATION AND LOCATION OF ITEMS FOR COORDINATION PURPOSES ONLY.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF ALL DEMOLISHED MATERIALS, ALL REMOVED MATERIALS SHALL BE DISPOSED OF, UNLESS NOTED AS 'RETURNED TO OWNER', OR "SALVAGED". THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL MATERIAL PERTAINING TO THE WORK FROM THE SITE. ALL REMOVED ITEMS NOT WANTED BY THE OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR. AN APPROPRIATE CONTAINER SHALL BE SUPPLIED BY THE CONTRACTOR AND LOCATED ON THE SITE WHERE APPROVED BY THE OWNER. DISPOSAL OF CONSTRUCTION RELATED MATERIALS SHALL BE ACCOMPLISHED IN A LEGAL MANNER. PROVIDE DOCUMENTATION OF LEGAL DISPOSAL IF REQUIRED BY OWNER.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGED WALLS, FOUNDATIONS, EQUIPMENT, ETC. CAUSED BY THIS DEMOLITION OR WEATHER EXPOSURE OF ITEMS THAT ARE TO REMAIN.
4. SOME INFORMATION AND DRAWINGS INCLUDED IN THESE CONTRACT DOCUMENTS PERTAINING TO THE WORK HAVE BEEN OBTAINED FROM DRAWINGS PROVIDED BY OTHERS, GENERAL FIELD MEASUREMENTS, AND OBSERVATIONS. THE INFORMATION IS INCLUDED HEREIN WITH THE INTENT TO PROVIDE THE CONTRACTOR WITH A BASIC UNDERSTANDING OF EXISTING CONDITIONS. ACTUAL CONDITIONS AND DIMENSIONS MAY VARY FROM THOSE INDICATED AND REQUIRE FIELD VERIFICATION. NOT ALL EXISTING CONSTRUCTION IS SHOWN. BIDDERS MAY REVIEW THE PROJECT SITE BY ARRANGEMENT WITH THE OWNER'S AGENT. CLAIMS FOR DEVIATIONS WHICH COULD HAVE BEEN OBSERVED BY FIELD OBSERVATION WILL NOT BE CONSIDERED.
5. CONTRACTOR TO INSPECT EXISTING OVERALL WORK AREAS, AND IDENTIFY TO THE OWNER AND ARCHITECT ANY ITEMS OF EXISTING FAULTS OR ITEMS OF CONCERN. CONTRACTOR IS RESPONSIBLE TO MAINTAIN A WATERTIGHT BUILDING ENVELOPE.
6. CONTRACTOR IS RESPONSIBLE FOR CODE COMPLIANT INTEGRATION OF NEW WORK INTO EXISTING AS NEEDED. LABEL ALL ELECTRICAL PANELS TO PROPERLY DOCUMENT NEW WORK.
7. CONTRACTOR IS RESPONSIBLE FOR SHORING AND BRACING DURING REMOVAL OF ALL KNOWN AND SUSPECTED STRUCTURAL COMPONENTS. REFER TO STRUCTURAL DRAWINGS OR SPECIFICATIONS FOR SPECIFIC REQUIREMENTS AT EXISTING CONDITIONS REQUIRING PARTIAL OR COMPLETE REMOVAL AND/OR MODIFICATION TO COMPONENTS OR ASSEMBLIES PERTAINING TO EXISTING BUILDING STRUCTURE. DO NOT CUT OR REMOVE STRUCTURAL ELEMENTS SUCH AS BEAMS, LINTELS, JOISTS AND TRUSSES UNLESS SPECIFICALLY INDICATED.
8. REFER TO MECHANICAL AND/OR ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR SPECIFIC REQUIREMENTS PERTAINING TO THE REMOVAL, RELOCATION AND/OR MODIFICATION OF ITEMS RELATED TO EXISTING MECHANICAL AND ELECTRICAL SYSTEMS.
9. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITIES AND FOR LOCATING, CUTTING AND CAPPING ALL UTILITIES SERVING THE STRUCTURES TO BE DEMOLISHED (OR RENOVATED). ANY DISRUPTION OF UTILITIES TO OFF-SITE USERS MUST BE APPROVED BY THE UTILITY COMPANY AND THE AFFECTED PARTIES IN ADVANCE.
10. THE CONTRACTOR IS RESPONSIBLE TO SUBMIT FOR AND ACQUIRE ALL NECESSARY PERMITS AND APPROVALS FOR ALL ASPECTS OF THE WORK. ALL FEE'S ARE THE RESPONSIBILITY OF THE CONTRACTOR.
11. REFER TO SITE DRAWINGS AND SPECIFICATIONS FOR SPECIFIC REQUIREMENTS PERTAINING TO THE REMOVAL AND OR MODIFICATION OF ITEMS RELATED TO THE EXISTING SITE ITEMS.
12. THE CONTRACTOR TO PROVIDE DRAINAGE CONTROL OF THE ENTIRE CONSTRUCTION SITE. THE CONTRACTOR IS REQUIRED TO PUMP STANDING WATER SO AS NOT TO UNDERMINE FOUNDATIONS, MAINTAIN SOIL INTEGRITY, GENERAL SAFETY AND TO MAINTAIN THE CONSTRUCTION SCHEDULE.
13. THE CONTRACTOR SHALL PLACE CONSTRUCTION FENCING AND BARRICADES ADJACENT TO THE EXTERIOR WORK AREAS. COORDINATE SIDEWALK CLOSURES AND INTERRUPTION OF USE TO PARK ALLEY AND EARLY LEARNING CENTER DRIVE AND PARKING LOT WITH THE OWNER IN ADVANCE.
14. CONTRACTOR IS RESPONSIBLE FOR SECURITY AND PROTECTION OF THE PROPERTY THROUGHOUT DEMOLITION WORK THROUGH SUBSTANTIAL COMPLETION. PROVIDE LIGHTING AS REQUIRED. PROVIDE OWNER DUPLICATE KEYS OF ANY LOCKS THAT SECURE PERIMETER GATES OR DOORS.
15. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS NOT TO DAMAGE EXISTING PAVING, SIDEWALKS AND CURBS WHERE NOTED TO REMAIN. IF THE PAVING, SIDEWALKS AND/OR CURBS ARE DAMAGED, THE CONTRACTOR SHALL REPAIR THEM TO THE SATISFACTION OF AUTHORITIES HAVING JURISDICTION.
16. THE CONDITION OF THE EXISTING BUILDING ON THE DATE OF THE PRE-BID MEETING IS THE CONDITION IN WHICH THE CONTRACTOR WILL ACQUIRE THE BUILDING. THE CONTRACTOR MUST INTERPRET NEEDS OF DEMOLITION AND RENOVATION BASED UPON THEIR INSPECTION. ALL TRASH AND DEBRIS REMAINING INSIDE AND OUTSIDE EACH BUILDING TO BE DEMOLISHED SHALL BE REMOVED AND DISPOSED OF AS PART OF THIS PROJECT.
17. WHERE PAVEMENT, WALKS, SLABS, ETC. ARE TO BE DEMOLISHED, SAWCUT EDGE AT ALL AREAS ADJACENT TO ITEMS INDICATED TO REMAIN TO PROVIDE CLEAN, STRAIGHT EDGE.
18. ACCESS TO THE CONSTRUCTION AREA FOR DEMOLITION / CONSTRUCTION RELATED ACTIVITIES SHALL BE AS DIRECTED BY THE OWNER. DELIVERIES AND CONSTRUCTION IS NOT TO AFFECT NORMAL ACTIVITIES OF ADJACENT SCHOOL FACILITIES. MAINTAIN CLEAR PATH FOR EMERGENCY VEHICLES.
19. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS AND ALL CONDITIONS RELATED TO NEW WORK.
20. PATCH FLOOR PENETRATIONS RESULTING FROM THE REMOVAL OF MECHANICAL AND ELECTRICAL ITEMS AND ALL WORK REQUIRED TO ACCEPT NEW SCHEDULED FLOOR FINISHES.
21. CONTRACTOR TO CLEAN WORK AREA DAILY.
22. CONTRACTOR TO COORDINATE WORK BY OWNER OR OTHERS WITHIN THE BUILDING AND SITE.

DEMOLITION LEGEND

(door symbol)	EXISTING DOOR TO REMAIN
(dashed door symbol)	EXISTING DOOR TO BE REMOVED
(dashed lines)	WALL TO BE REMOVED TO LIMITS SHOWN
(shading)	SHADING INDICATES EXISTING CONSTRUCTION TO REMAIN. PROTECT.
VTR	VENT THRU ROOF TO REMAIN. PROTECT.
EV	EXHAUST VENT TO REMAIN.

SHERMAN CARTER BARNHART ARCHITECTS

SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

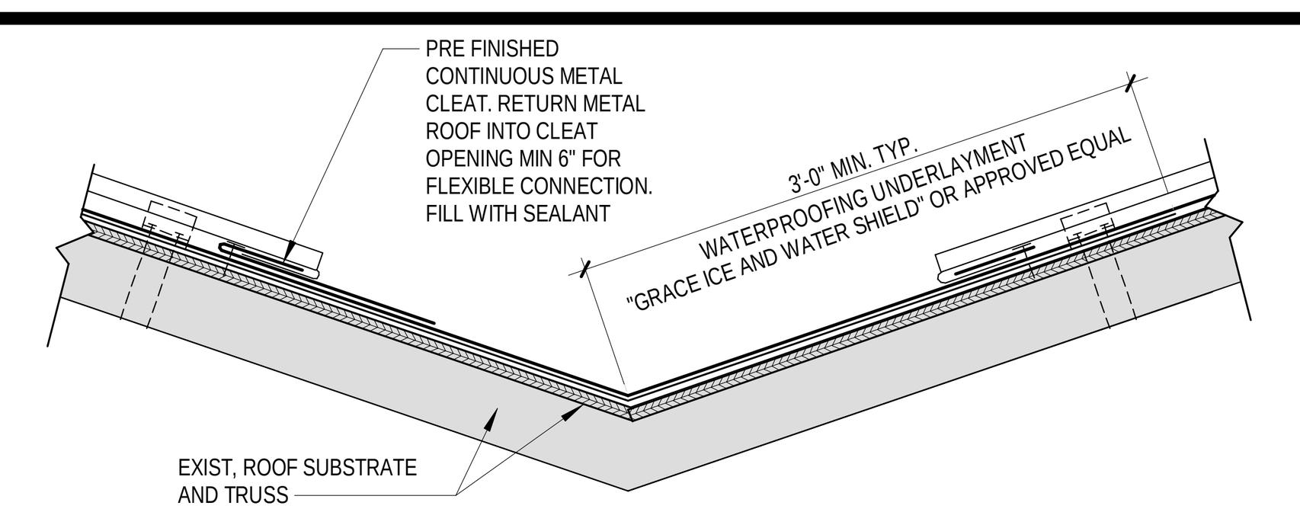
DEMOLITION FLOOR PLANS, DEMOLITION NOTES, PICTORIAL PLAN AND PICTURES

JOB NO.	2448
DATE	02 • 26 • 25
DRAWN	ALC, CTM
CHECKED	ASC

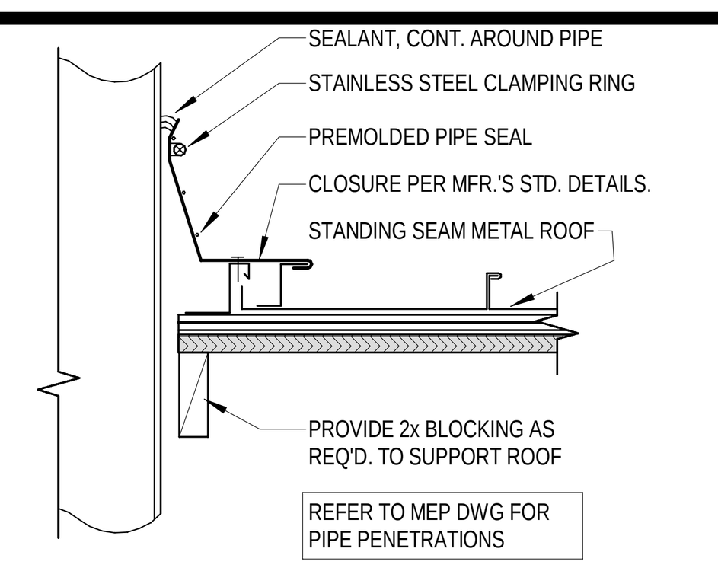
REVISIONS

No.	Description	Date

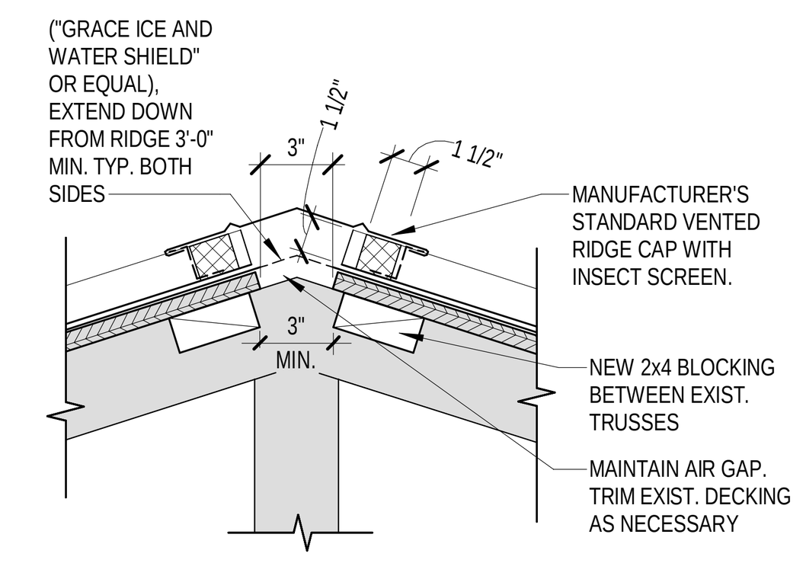
SHEET
D1.0



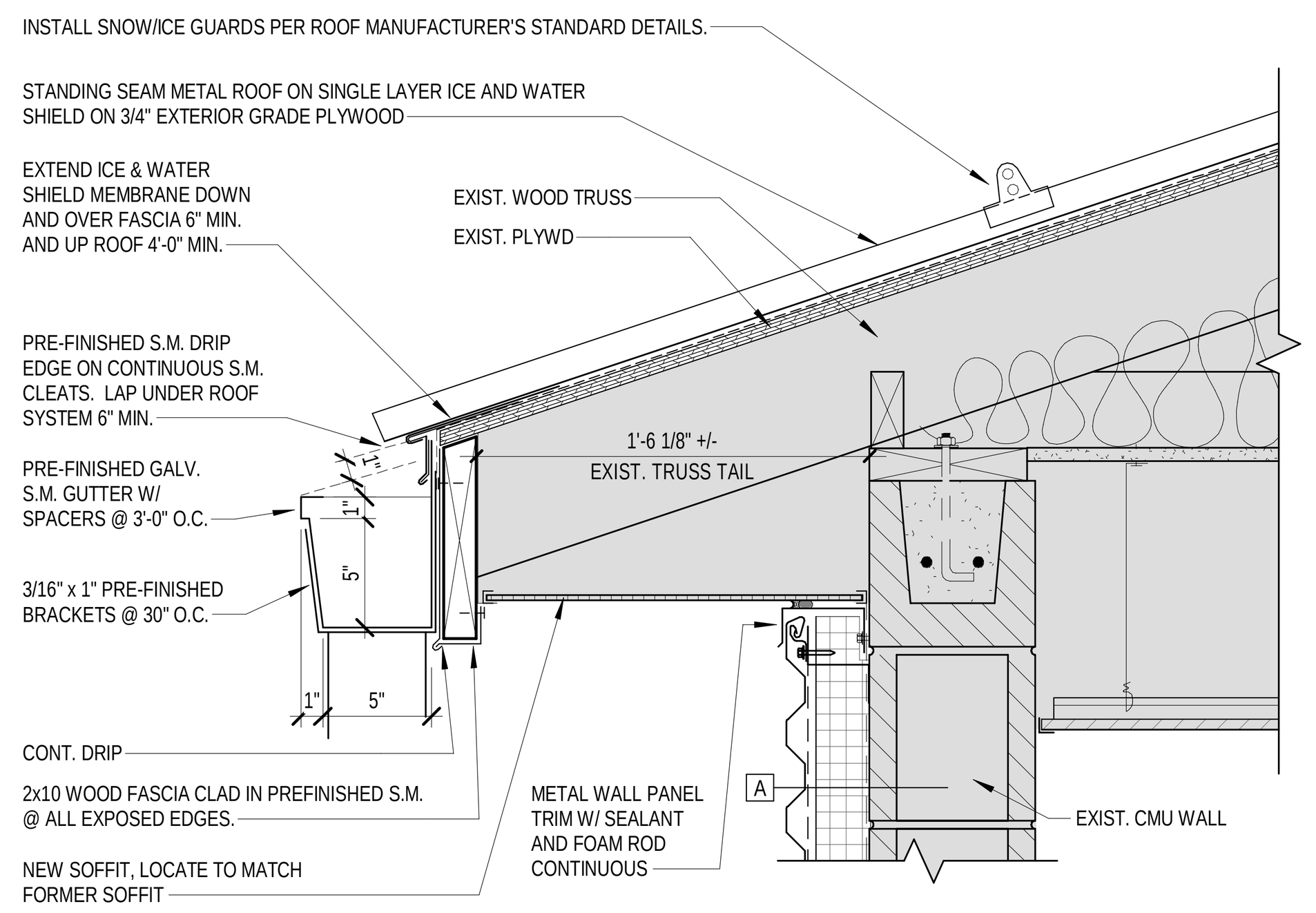
5 TYPICAL ROOF VALLEY DETAIL
1" = 1'-0"



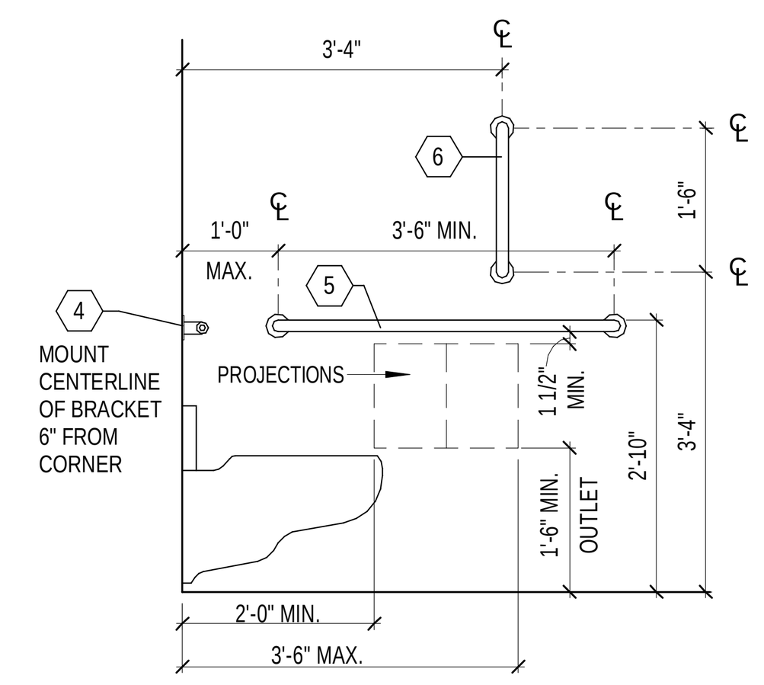
4 ROOF PENETRATION DETAIL
1 1/2" = 1'-0"



3 RIDGE VENT DETAIL
1 1/2" = 1'-0"

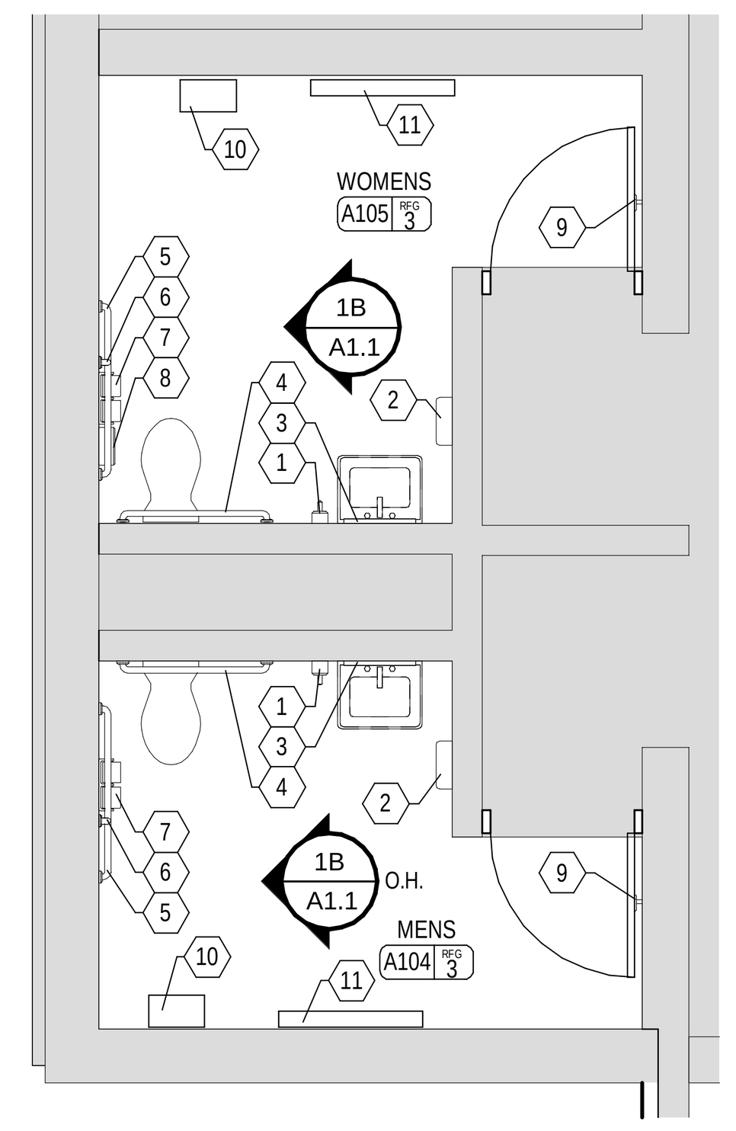


6 EAVE DETAIL
1 1/2" = 1'-0"

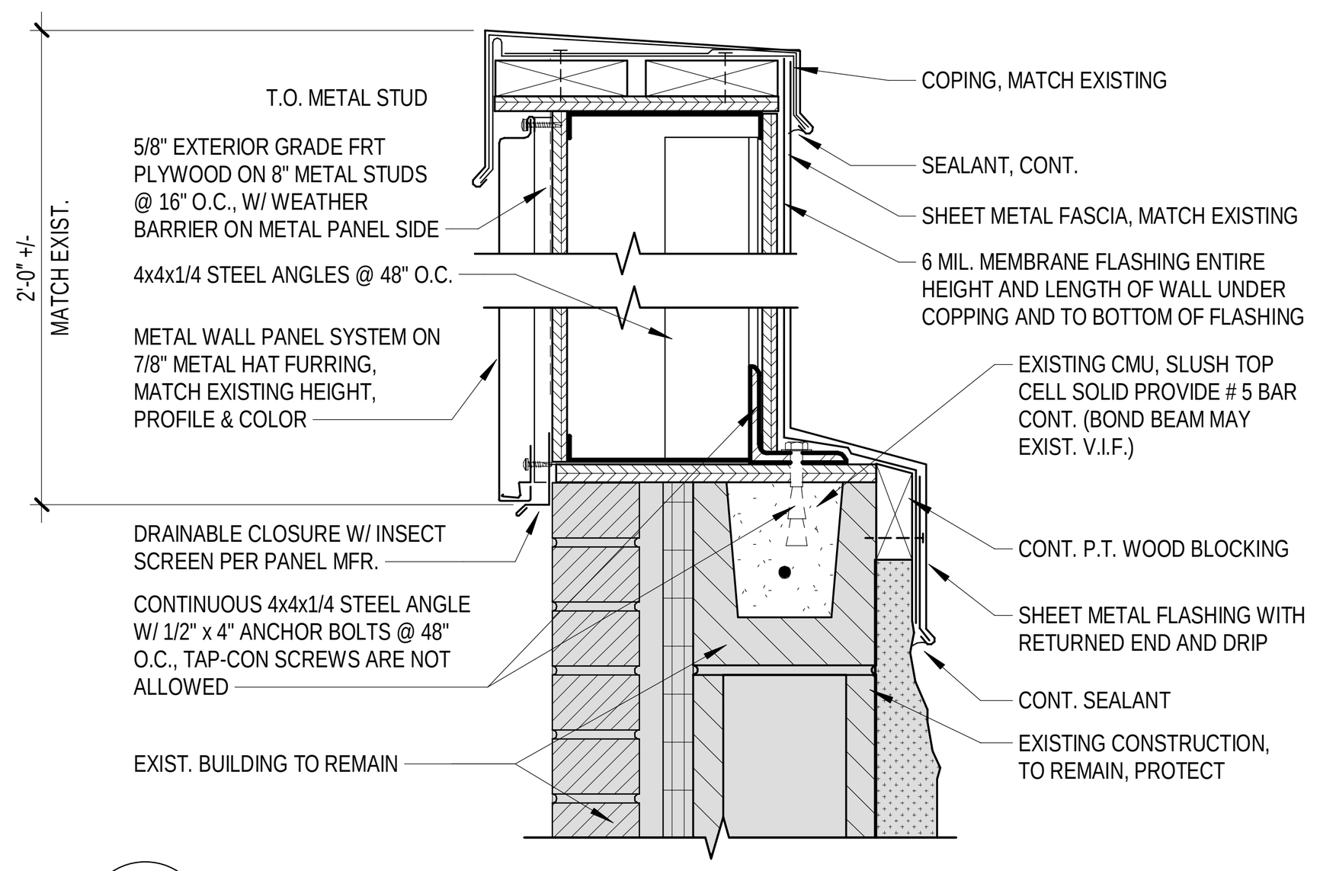


TYP. LAYOUT OF GRAB BARS AND ACCESSORIES @ ADA TOILETS

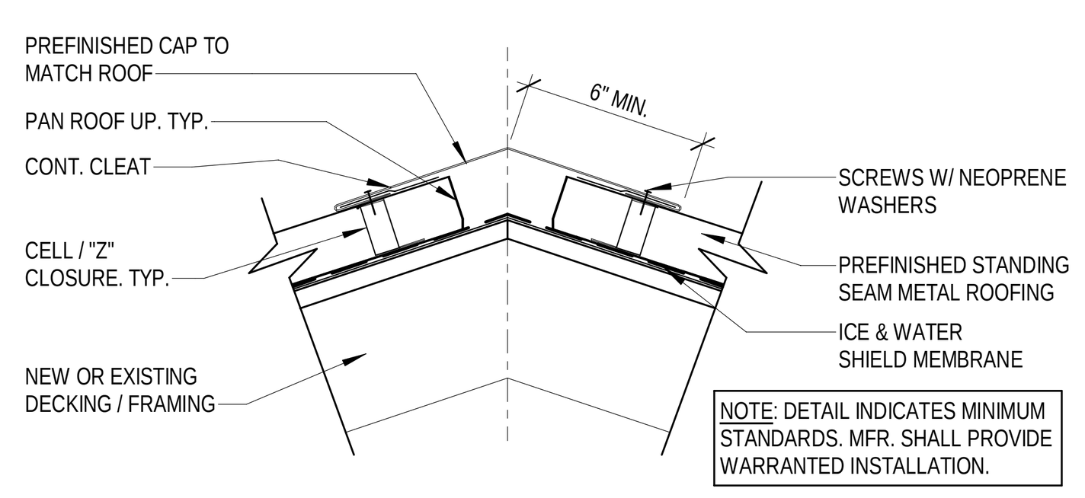
1B TYP. TOILET GRAB BAR AND ACCESSORIES LAYOUTS
1/2" = 1'-0"



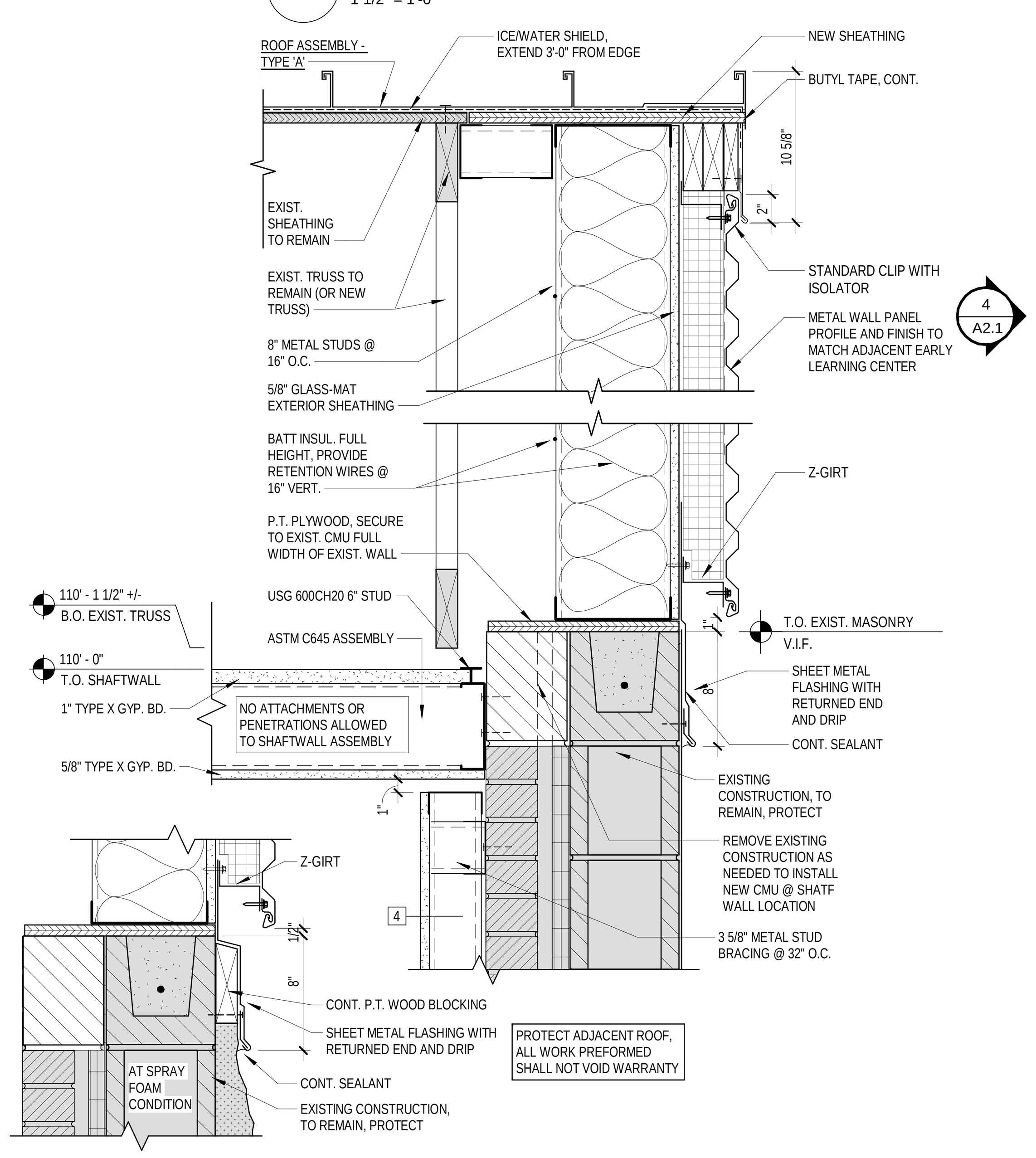
1A ENLARGED RESTROOM PLAN
1/4" = 1'-0"



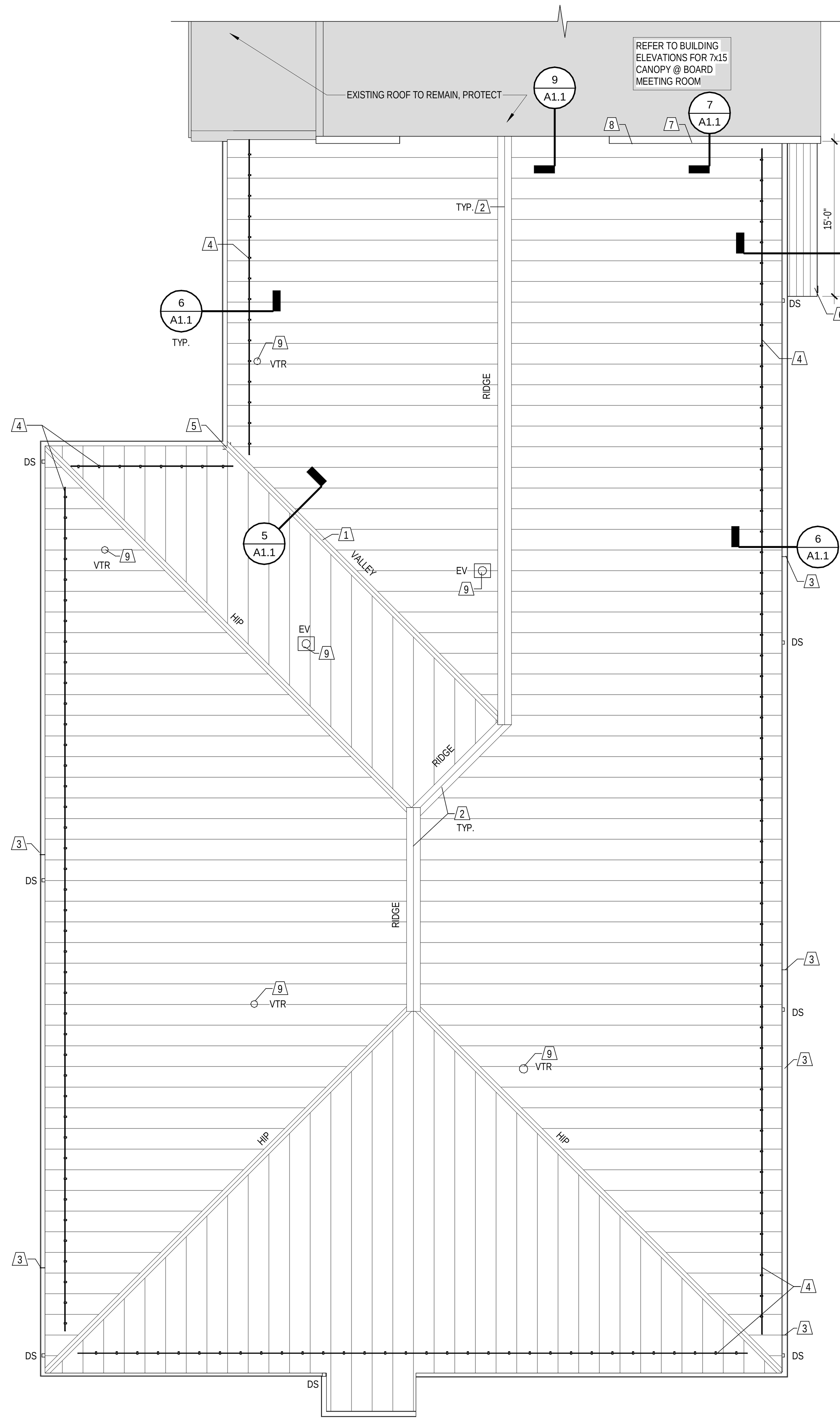
7 ROOF DETAIL
1 1/2" = 1'-0"



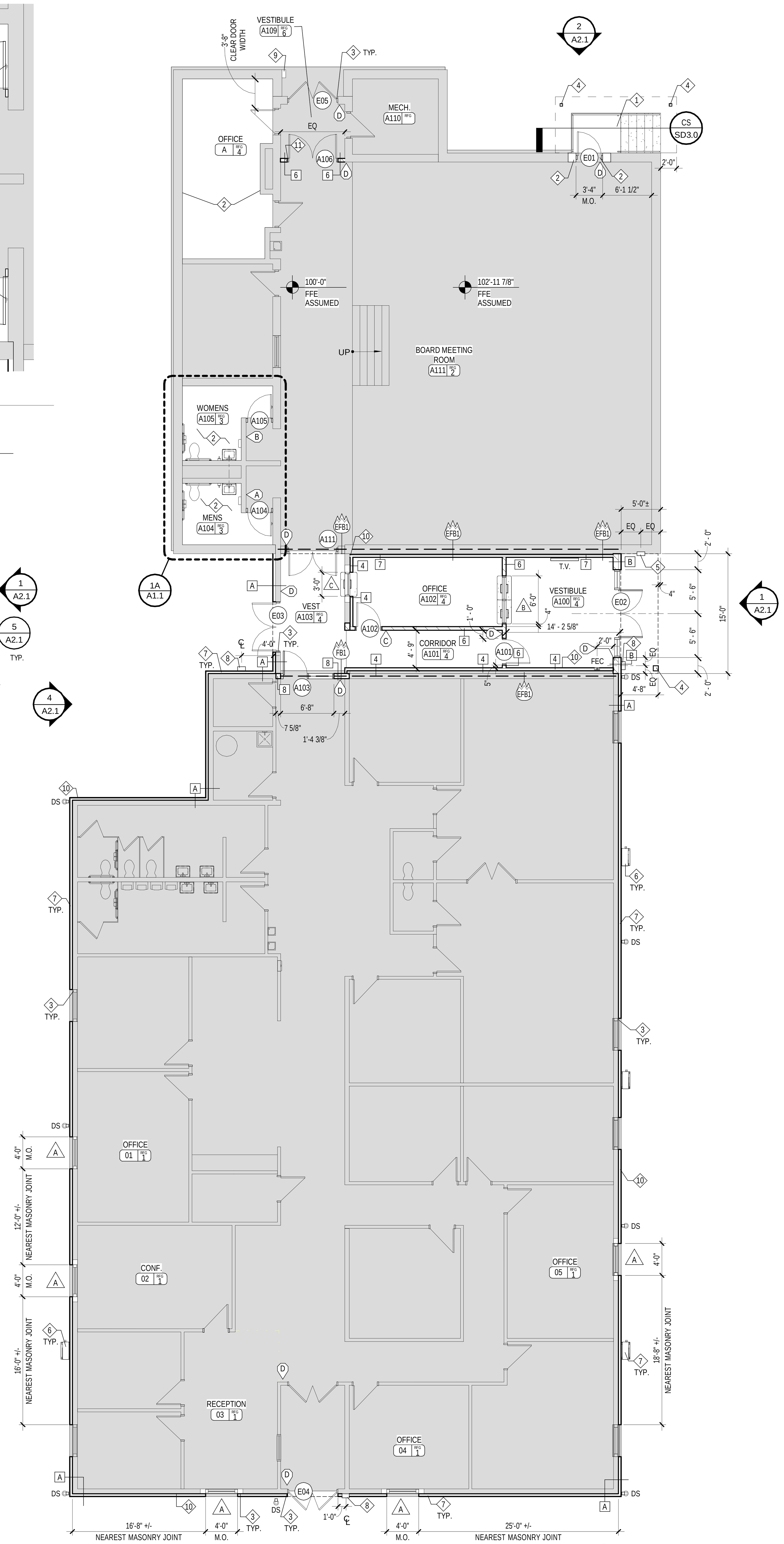
8 ROOF HIP CAP DETAIL
1 1/2" = 1'-0"



9 ROOF DETAIL
1 1/2" = 1'-0"



2 ROOF PLAN
1/8" = 1'-0"



1 NEW WORK PLAN
1/8" = 1'-0"

TOILET ACCESSORY SCHEDULE

-	ACCESSORY	MTG. HT.
1	S.S. SOAP DISPENSER - OFOI	SALVAGE & REINSTALL EXISTING
2	PAPER TOWEL DISPENSER	SALVAGE & REINSTALL EXISTING
3	MIRROR W/ S.S. FRAME - 18"x36" - OFOI	40" TO BOTTOM
4	36" S.S. GRAB BAR (1-1/4")	33" TO CENTERLINE
5	42" S.S. GRAB BAR (1-1/4")	33" TO CENTERLINE
6	18" VERTICAL S.S. GRAB BAR (1-1/4")	39" TO CENTERLINE
7	TOILET PAPER DISPENSER -	SALVAGE & REINSTALL EXISTING
8	SANITARY NAPKIN DISPOSAL	24" TO TOP
9	CLOTHES HOOK AND BUMPER(SURFACE MOUNTED)	48" TO CENTER
10	TRASH RECEPTACLE	SALVAGE & REINSTALL EXISTING
11	CHANGING TABLE - OFOI	27" TO B.O. WORK SURFACE (OPENED)

GENERAL TOILET ACCESSORY NOTES:

1. PROVIDE SOLID WD. BLKG. AS REQ'D FOR SUPPORT OF ACCESSORIES.
2. ALL ITEMS SHALL BE LOCATED HORIZONTALLY AND MTD. TO SPECIFIC POINTS A.F.F. IN ACCORDANCE W/ ALL APPLICABLE REQUIREMENTS OF "AMERICANS WITH DISABILITIES ACT" (A.D.A.) AND ANSI A117.1-2009.
3. INSTALL TO ALLOW 1-1/2" CLEARANCE BETWEEN GRAB BAR AND WALL.
4. REFER TO MECH., PLBG., AND ELEC. DWGS AND SPECS. FOR PLBG. FIXTURES AND CONTROLS. ALL EXPOSED PIPING @ ADA LAV'S. SHALL BE INSULATED AND COVERED WITH RIGID JACKET.
5. REFER TO DETAIL 1B THIS SHEET FOR TYPICAL GRAB BAR / ACCESSORY LAYOUT.

FLOOR PLAN KEYNOTES

1. CONCRETE STOOP, STEPS AND RAILINGS. REFER TO SITE.
2. PATCH EXISTING WALL FROM PARTIAL SELECT DEMOLITION. TOOTH-IN BRICK AND CMU.
3. PROVIDE BACKER ROD AND SEALANT AT PERIMETER OF NEW AND EXISTING EXTERIOR WINDOW AND DOOR OPENINGS. TYP.
4. CANOPY COLUMN/ DOWNSPOUT. REFER TO SITE DRAWINGS FOR STORM DRAINAGE.
5. KNOX BOX VAULT. RECESS INTO EXISTING MASONRY.
6. EXISTING MECHANICAL UNIT, REMOVE AND REINSTALL SYSTEM AS NECESSARY REFER TO MECHANICAL.
7. NEW METAL WALL PANEL ASSEMBLY OVER EXISTING CMU. SEE DETAILS 10, 11, 12 ON SHEET A0.1, 6A1.1 AND 6/A2.1.
8. VIDEO INTERCOM, RECESS INTO METAL WALL PANEL IN WATERPROOF BOX. CUSTOM COLOR TO MATCH WALL PANELS.
9. VIDEO INTERCOM. SURFACE MOUNT TO EXISTING MASONRY. PAINT EXPOSED CONDUIT AND FASTENERS.
10. EXISTING MASONRY WAINSCOTT TO REMAIN, BELOW NEW METAL WALL PANEL. REFER TO DETAIL 12/A0.1.
11. PROVIDE CONTINUOUS CHANNEL SLOT MASONRY TIES AT 16" O.C. TO SECURE NEW CMU TO ADJACENT MASONRY.

NEW WORK LEGEND

EXISTING DOOR AND FRAME TO REMAIN.

EXISTING WINDOW FRAMING. PROVIDE SEALANT AT PERIMETER. CLEAN FRAME AND GLASS.

EXISTING CONSTRUCTION TO REMAIN. FILL HOLES / VOIDS, CLEAN, PRIME AND PAINT PREVIOUSLY PAINTED SURFACES.

NEW WINDOW. REFER TO SHEET A0.1

ROOM / WALL DESIGNATION
EFB1 EXISTING FIRE BARRIER, 1-HOUR RATED
FB1 FIRE BARRIER, 1-HOUR RATED
HA1 HORIZONTAL ASSEMBLY, 1-HOUR RATED

NEW DOOR . REFER TO DOOR SCHEDULE, SHEET A0.1

ROOM # RFG # — ROOM NAME AND NUMBER, REFER TO ROOM FINISH GROUPS SHEET AO.1.

X — DOOR NUMBER, REFER TO DOOR SCHEDULE SHEET A0.1

X — FRAME TYPE, REFER TO FRAME ELEVATIONS. REFER TO SHEET A0.1.

X — PANEL SIGN, WITH BRAILLE. REFER TO SHEET A0.1.

DS — DOWNSPOUT

FEC — FIRE EXTINGUISHER AND CABINET. MOUNT TOP OF HANDLE AT 54" A.F.F.

NIC — NOT IN CONTRACT

GENERAL ROOF NOTES

1. NEW ROOF IS INSTALLED ON EXISTING SUBSTRATE, CONTRACTOR SHALL CONFIRM EXISTING MATERIAL IS IN SOUND RELIABLE CONDITION PRIOR TO INSTALLATION OF NEW WORK TO INSURE WARRANTY DEMANDS ARE MET.
2.. THE CONTRACTOR TO INCLUDE AN ALLOWANCE FOR THE REPLACEMENT OF PLYWOOD, WOOD BLOCKING AND WOODEN STRUCTURE IF DISCOVERED DURING DEMOLITION AND UPON INSPECTION. REFER TO SPECIFICATIONS.
3. REFER TO MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL ROOF MECH/ELEC ITEMS THAT MAY NOT BE SHOWN ON THIS PLAN.
4. FLASH ALL ROOF PENETRATIONS PER MANUFACTURER'S STANDARD DETAILS, U.N.O.
5. THE ROOFING CONTRACTOR SHALL NOT CONCEAL ANY WEEPS, BRICK VENTS, EXPANSION JOINTS, OR FLASHINGS. ROOFING SHALL TERMINATE AS SHOWN ON DETAILS.
6. THE CONTRACTOR SHALL COORDINATE INSTALLATION INSURE OF ROOFING/FLASHING WITH OTHER TRADES FOR ADDITIONAL WORK REQUIRED.

ROOF LEGEND

ROOF ASSEMBLY - TYPE 'A'
STANDING SEAM METAL ROOF OVER #15 36" WIDE, PROVIDE ICE AND WATERGUARD MEMBRANE AT PERIMETER AND ALL CHANGES IN ROOF SLOPED OVER NEW OR EXISTING DECKING.

EXISTING ROOF TO REMAIN, PROTECT

■ DS — PRE-FIN. 5"x5" S.M. DOWNSPOUT. TIE INTO NEW BOOT AND STORM SYSTEM, REFER TO CIVIL DWGS.

ROOF KEY NOTES

1. PRE-FIN. S.M. VALLEY PER MANUFACTURER'S RECOMMENDATIONS. SEE DETAIL 5/A1.1.
2. PRE-FIN S.M. RIDGE VENT PER MANUFACTURER'S RECOMMENDATIONS. (SEE DETAIL 8, THIS SHEET).
3. GUTTER EXPANSION JOINT (PROVIDE @ 40'-0" MAX.).
4. SNOW / ICE RAIL, INSTALL PER MFR. RECOMMENDATIONS.
5. PRE-FIN. S.M. DIVERTER, TYP. PER MANUFACTURERS RECOMMENDATIONS.
6. PRE-ENG. CANOPY. SEE DETAIL 5/A2.1.
7. EXISTING PARAPET/FASCIA TO REMAIN. CLEAN PRIME AND PAINT.
8. RECLAD PARAPET/FASCIA WITH SHEET METAL TO NEAREST CONTINUOUS VERTICAL JOINT. SEAM NEW EDGE INTO EXISTING SHEET METAL. PRIME AND PAINT.
9. EXISTING ROOF PENETRATION ASSEMBLY. PROTECT AND INTEGRATE INTO ROOFING FOR PROPER FUNCTION AND WATERTIGHT CONDITION. (LOCATIONS APPROXIMATED).

SHERMAN CARTER BARNHART ARCHITECTS

SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

FLOOR PLAN, ROOF PLAN AND DETAILS

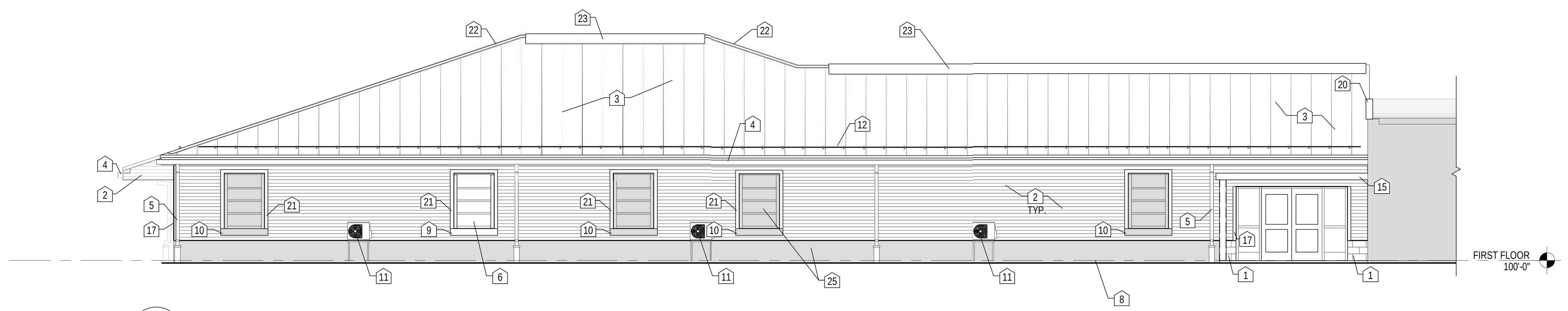
JOB NO.	2448
DATE	02 • 26 • 25
DRAWN	CTM
CHECKED	TSS

REVISIONS

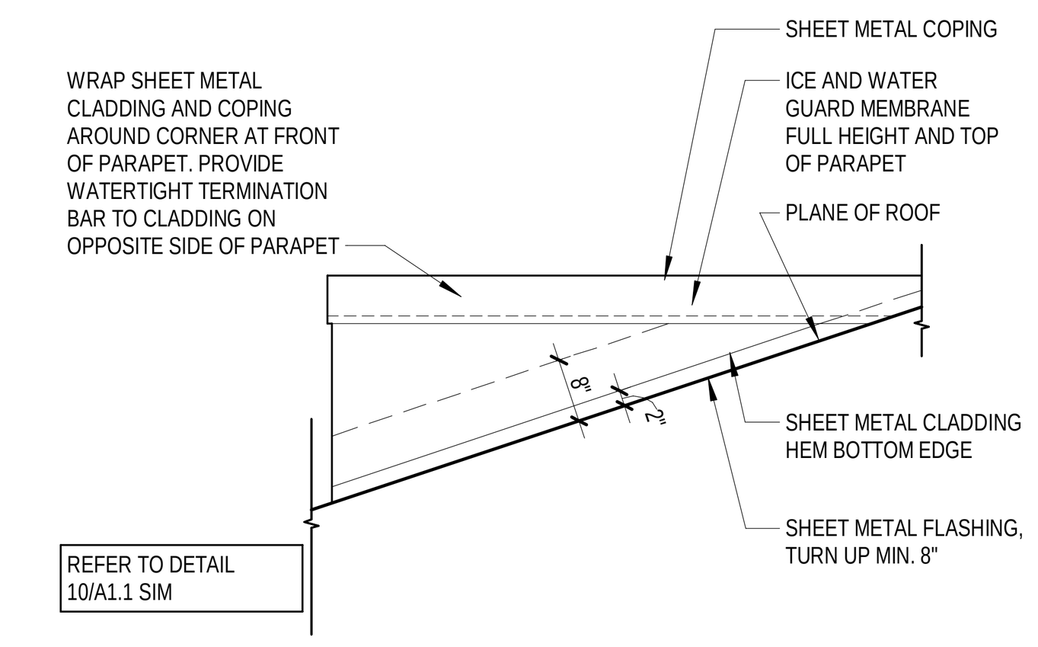
No.	Description	Date

SHEET
A1.1

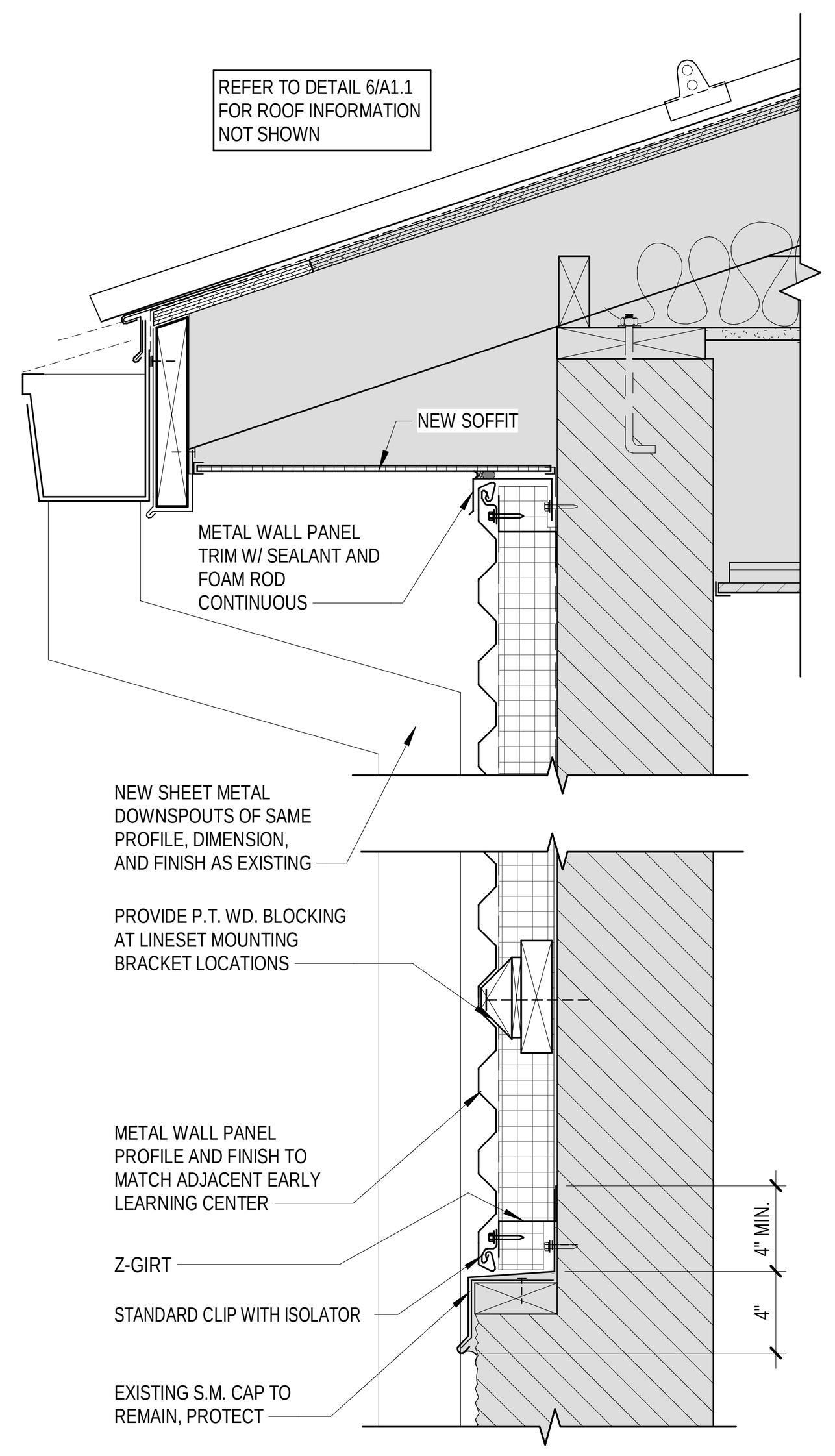
2448
SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
3/10/2025 11:31:05 AM



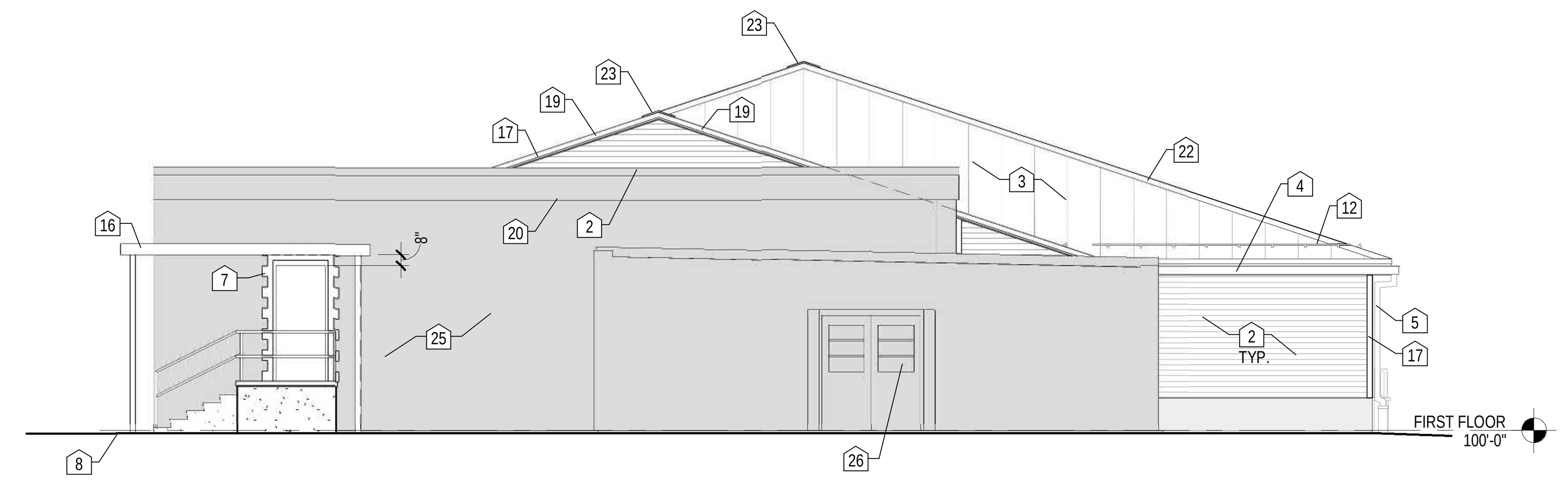
1 BUILDING ELEVATION
1/8" = 1'-0"



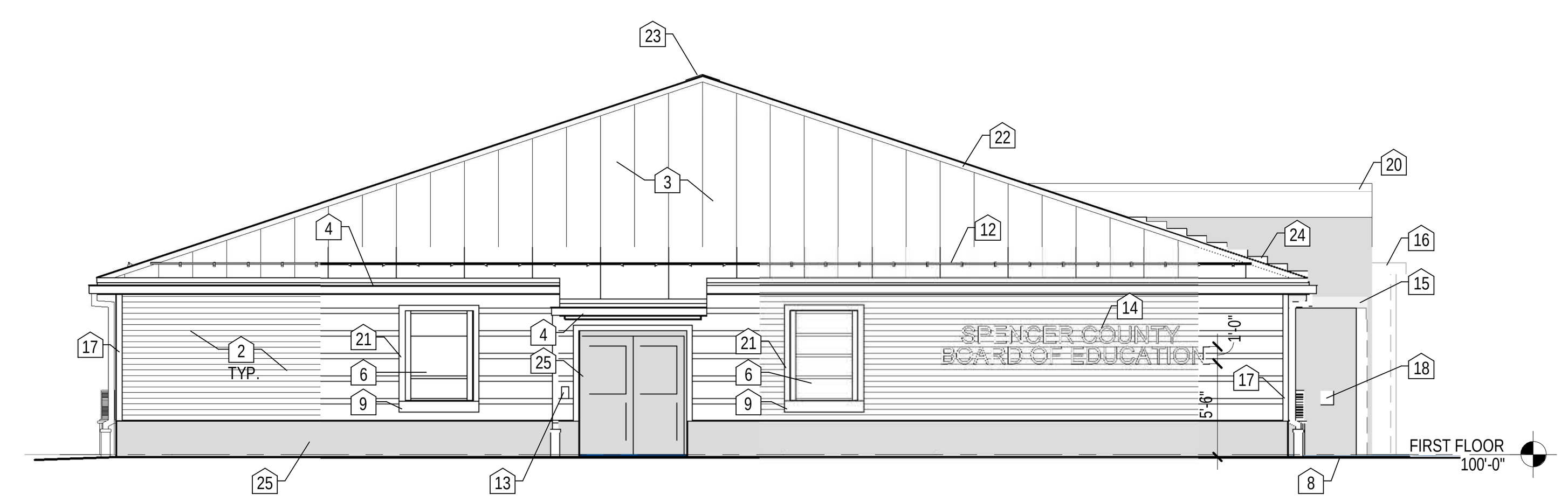
9 DETAIL
N.T.S.



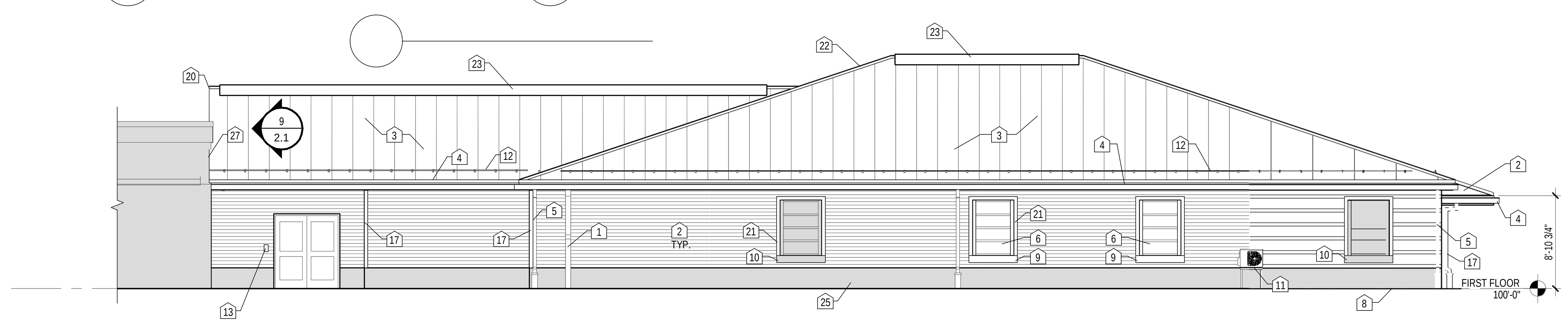
6 DETAIL
1 1/2" = 1'-0"



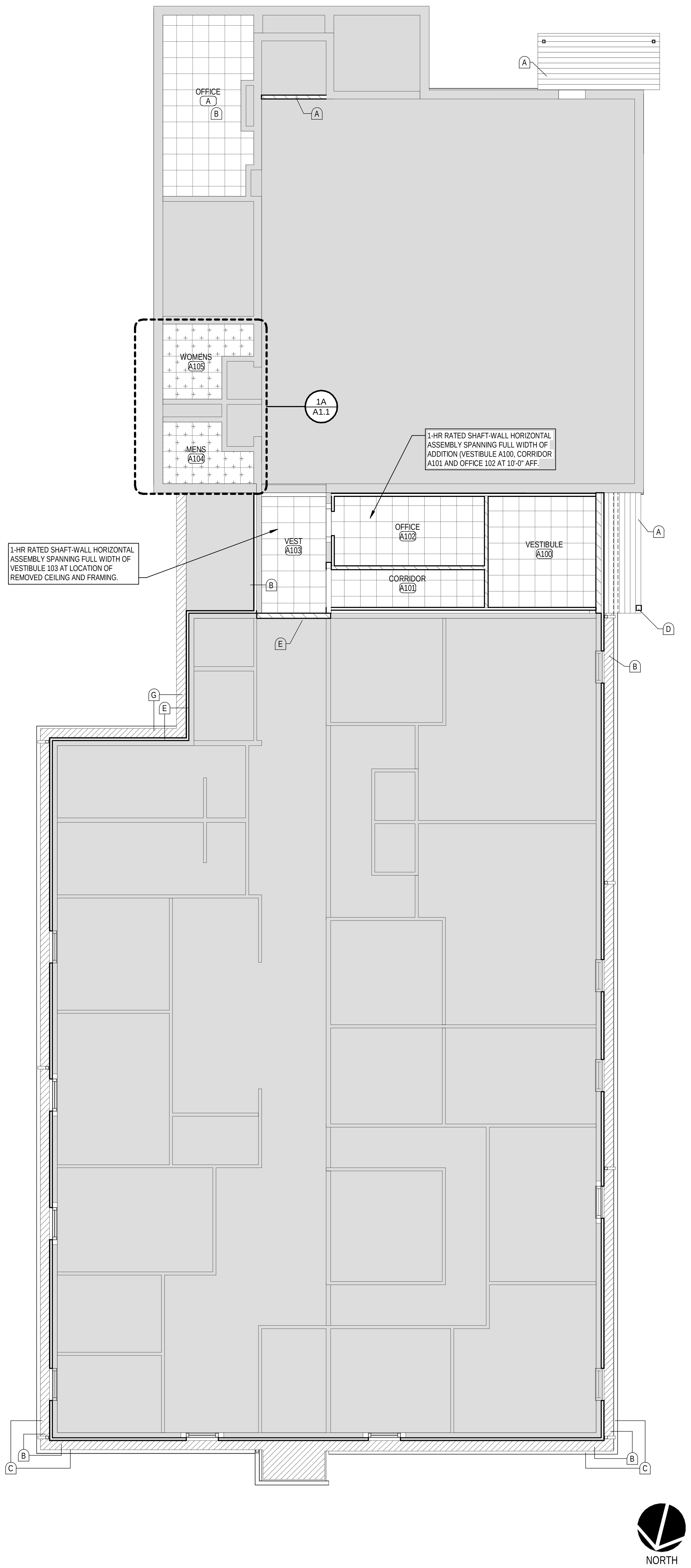
2 BUILDING ELEVATION
1/8" = 1'-0"



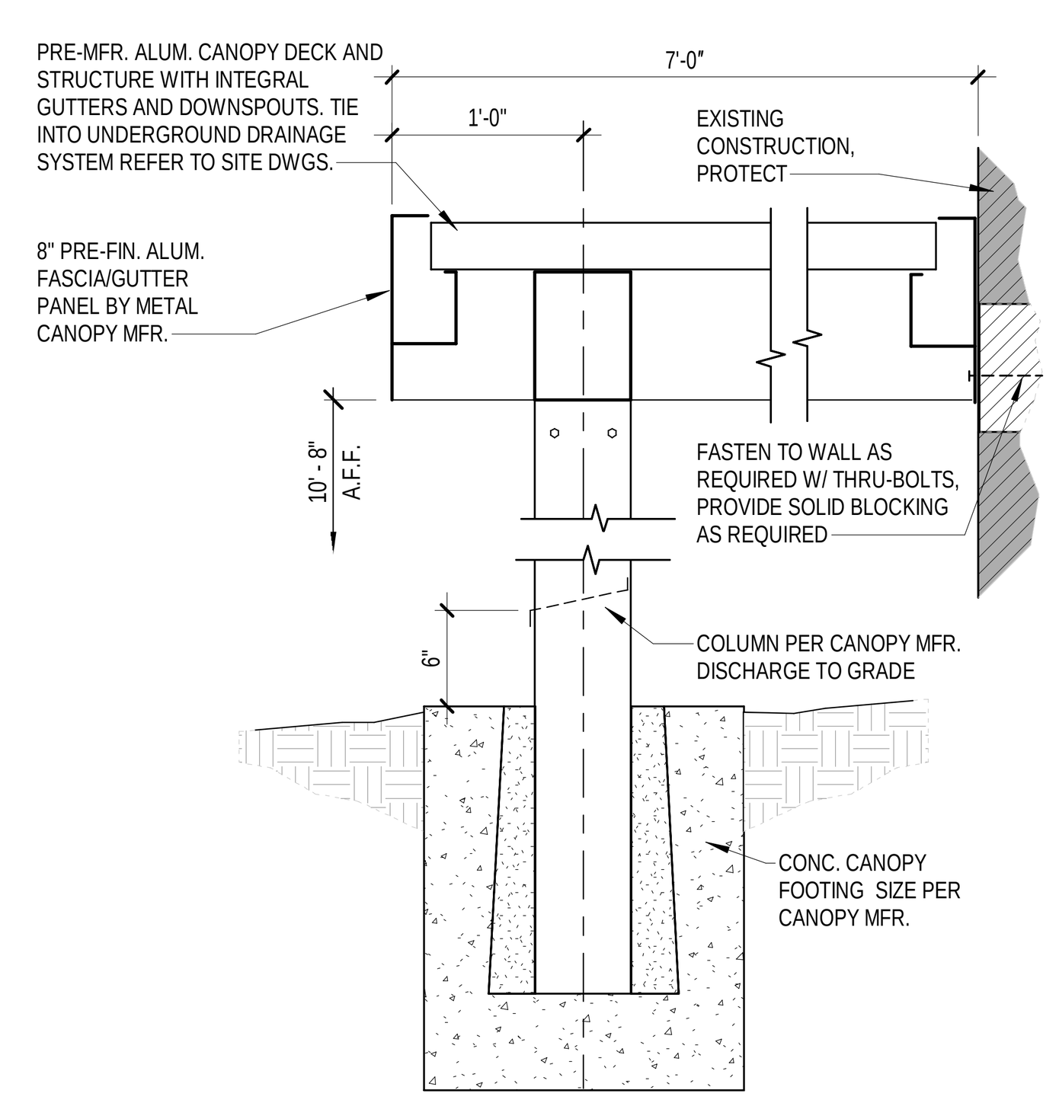
3 BUILDING ELEVATION
1/8" = 1'-0"



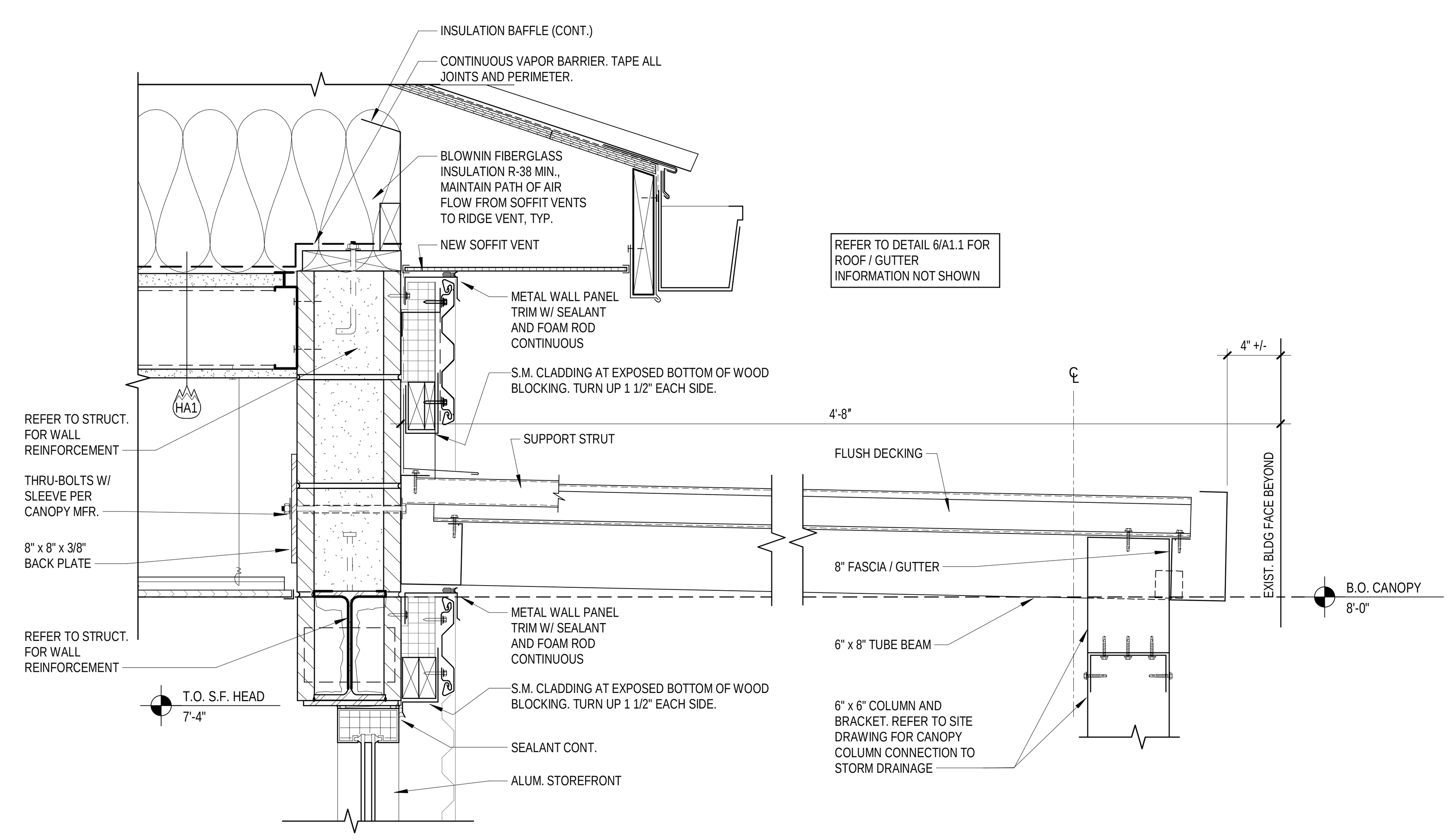
4 BUILDING ELEVATION
1/8" = 1'-0"



7 REFLECTED CEILING PLAN
1/8" = 1'-0"



8 CANOPY DETAIL
1" = 1'-0"



5 DETAIL
1 1/2" = 1'-0"

GENERAL ELEVATION NOTES

BUILDING ELEVATIONS SHOWN ON THIS DRAWING ARE INTENDED FOR GENERAL REFERENCE PURPOSES ONLY. REFER TO REFERENCED SECTIONS AND DETAILS FOR MORE FULLY DESCRIBED CONDITIONS AND REQUIREMENTS.

A. LINES REPRESENTING PAVING AND FINISH GRADES ARE APPROXIMATE AND ARE SHOWN FOR REFERENCE PURPOSES ONLY. REFER TO SITE PLANS FOR SPECIFIC GRADE AND SPOT ELEVATIONS AT EACH RESPECTIVELY.

B. REFER TO FLOOR PLANS FOR LOCATION AND DOOR SCHEDULE FOR FULL EXTENT AND COMPLETE DESCRIPTION OF DOOR AND FRAME TYPES. PORTIONS OF DOORS, WINDOWS STOREFRONTS, AND CURTAIN WALLS MAY BE CONCEALED BY OTHER BUILDING FEATURES SHOWN.

C. ALL COMPONENTS OF METAL WALL PANEL TO BY SAME SINGLE MANUFACTURER. PROVIDE TRIM, FLASHINGS, JOINTS, ETC. FOR WATER TIGHT ASSEMBLY. PERFORM WATER TEST TO CONFIRM. DOCUMENT TEST AND RESULTS TO OWNER AND ARCHITECT.

D. REFER TO ELECTRICAL AND MECHANICAL DRAWINGS FOR COMPONENTS WHICH APPLY TO EXTERIOR ELEVATIONS.

E. PROVIDE SOLID BLOCKING TO SUPPORT DOWNSPOUTS/ CARD READERS/ DIMENSIONAL LETTERS/ LIGHTING MECHANICAL UNITS AND LINE SETS AS NEEDED.

(X) ELEVATION KEY NOTES

NOTE: NOT ALL ELEVATION KEY NOTES APPLY TO ALL TO ALL ELEVATION SHEETS.

1. SPLITE FACE CMU TO MATCH EIXISTING IN DIMENSION, CLEFT AND FINISH.
2. NEW METAL WALL PANEL, REFER TO WALL TYPES. REFER TO DETAILS, THIS SHEET. REMOVE AND REINSTALL EXISTING CONDUIT AND MOUNTING/ BRACKETS AS NEEDED FOR METAL WALL PANEL INSTALLATION.
3. STANDING SEAM ROOF, REFER TO ROOF PLAN.
4. GUTTER, REFER TO ROOF PLAN.
5. DOWNSPOUT INTO BOOT, REFER TO ROOF PLAN AND SITE.
6. NEW WINDOW IN EXISTING WALL.
7. NEW H.M. FRAME AND DOOR IN EXISTING WALL TOOTH-IN NEW MASONRY.
8. FIN. GRADE, REFER TO SITE.
9. NEW CONCRETE WINDOW SILL TO MATCH EXISTING. DIMENSION PROFILE AND FINSIH.
10. EXISTING CONCRETE SILL TO REMAIN.
11. EXISTING MECH. UNIT. REMOVE AND REINSTALL AS NEEDED. REFER TO MECH.
12. SNOW RAIL. REFER TO DETAIL 6/A1.1.
13. VIDEO/ INTERCOM REFER TO ELECETRICAL.
14. 12" TALL DIMENSIONAL LETTERS.
15. MANUFACTURED CANOPY REFER TO DETAILS 5/A2.1 REFER TO SITE FOR BELOW GRADE CONNECTION TO STORM DRAIN.
16. MANUFACTURED CANOPY COLUMN. REFER TO DETAIL 8, THIS SHEET.
17. METAL CORNER TRIM BY METAL WALL PANEL MANUFACTURER.
18. RECESSED KNOX BOX KEY VAULT. REMOVE AND SALVAGE BRICK FOR INSTALLATION TOOTH IN.
19. METAL RAKE.
20. METAL COPING AND FASCIA
21. PERIMETER HEAD AND JAMB TRIM AT NEW/ EXISTING WINDOW OPENINGS.
22. HIP CAP TRIM. REFER TO ROOF PLAN.
23. RIDGE VENT. REFER TO ROOF PLAN.
24. SHEET METAL STEP FLASHING AT NEW ROOF TO EXISTING BRICK VENEER. RAKE MASONRY JOINTS 1 1/2" SECURE WITH WEDGES AND SEALANT.
25. EXISTING CONSTRUCTION TO REMAIN (SHOWN HATCHED). PROTECT.

(X) REFLECTED CEILING KEY NOTES

A. UNDERSIDE OF MANUFACTURED CANOPY SYSTEM.
B. NEW SOFFIT.
C. NEW GUTTER AND DOWNSPOUT ASSEMBLY.
D. CANOPY COLUMN/ DOWNSPOUT.
E. PATH EXISTING CEILING AS NECESSARY FROM NEW CONSTRUCTION.
F. 15'-0" x 7'-0" CANOPY, REFER TO DETAIL 8/A2.1.

CEILING LEGEND AND NOTES

- EXISTING CEILING TO REMAIN, PROTECT.
- NEW TYPE 2'x2' SUSPENDED ACOUSTICAL CEILING ASSEMBLY.
- NEW TYPE 2'x2' VINYL FACED SUSPENDED ACOUSTICAL CEILING.
- VINYL SOFFIT
- RATED SHAFTWALL CEILING ASSEMBLY

SHERMAN CARTER BARNHART ARCHITECTS

SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION

110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

BUILDING ELEVATIONS AND BUILDING SECTIONS

JOB NO.	2448
DATE	02 • 26 • 25
DRAWN	CTM
CHECKED	TSS

REVISIONS

No.	Description	Date

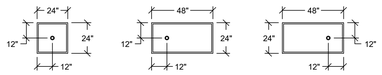
SHEET
A2.1

2448
SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
3/5/2025 11:25:06 AM

PLUMBING/FIRE PROTECTION LEGEND

PLUMBING SYMBOLS

SYMBOL	DESCRIPTION
	PIPE DOWN
	PIPE UP
	TEE DOWN
	TEE UP
	CONTINUATION
	CAP
	HAMMER ARRESTOR
	BALANCING VALVE
	BALL VALVE
	BUTTERFLY VALVE
	ELECTRIC CONTROL VALVE
	PRESSURE REDUCING VALVE
	CHECK VALVE
	GATE VALVE
	PLUG VALVE
	REDUCER
	UNION
	VALVE IN VERTICAL
	PRESSURE GAUGE
	STRAINER
	FLOW INDICATOR
	CLEANOUT
	FLOOR CLEANOUT
	THERMOMETER
	RECIRC. BALANCING STATION
FS	FLOW SWITCH
TS	TAMPER SWITCH ON VALVE
	PUMP, INLINE
	SUMP PUMP
G	GAS METER
W	WATER METER
TB	THRUST BLOCK
R	GAS REGULATOR
	FLOOR DRAIN
	P-TRAP
	FLOOR DRAIN GRATE
TS	FIRE PROTECTION RISER
	FIRE PROTECTION CONNECTION (DOUBLE)
	FIRE PROTECTION CONNECTION (SINGLE)
XX	SHEET NOTE
XX	DEMOLITION NOTE
	CONNECT NEW TO EXISTING
	EXTENT OF DEMOLITION
XX-XX	EQUIPMENT TAG
RISER X PX.XX	RISER IDENTIFICATION TAG



HEAD PLACEMENT IN ACOUSTICAL TILE

ABBREVIATIONS

ADP	ACID DILUTION PIT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AG	AIR GAP
AV	ACID VENT
AW	ACID WASTE
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BTU	BRITISH THERMAL UNIT
CA	COMPRESSED AIR
CFH	CUBIC FEET/HOUR
CI	CAST IRON
CRD	COMBINATION ROOF DRAIN
CO	CLEANOUT
CON	CONDENSATE
CW	COLD WATER
D	DISPOSAL
DD	DECK DRAIN
DI	DUCTILE IRON
DF	DRINKING FOUNTAIN
DSN	DOWNSPOUT NOZZLE
ECO	EXTERIOR CLEANOUT
EEW	EMERGENCY EYE WASH
ESEW	EMERGENCY SHOWER / EYE WASH
ET	EXPANSION TANK
ETP	ELECTRONIC TRAP PRIMER
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FS	FLOOR SINK
FS	FLOW SWITCH
G	NATURAL GAS
GPM	GALLONS PER MINUTE
GR	GREASE
GRV	GREASE VENT
GT	GREASE TRAP
GWH	GAS WATER HEATER
HA	HAMMER ARRESTOR
HB	HOSE BIBB
HW	HOT WATER
HWR	HOT WATER RETURN
I.E.	INVERT ELEVATION
IMB	ICE MAKER BOX
L/LAV	LAVATORY
LPG	LIQUID PETROLEUM GAS
LT	LAUNDRY TUB
MA	MEDICAL AIR
MB	MOP BASIN
MBH	1,000 BTU
MG	MEDICAL GAS
MH	MANHOLE
MIN	MINIMUM
MS	MOP SINK
N2	NITROGEN
O2	OXYGEN
OR	OPEN RECEPTACLE
ORD	OVERFLOW ROOF DRAIN
ORL	OVERFLOW ROOF LEADER
OWS	OIL WATER SEPARATOR
PD	PUMP DISCHARGE
PDI	PLUMBING DRAINAGE INSTITUTE

ABBREVIATIONS CONT.

PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PT	PLASTER TRAP
RBS	RECIRC. BALANCE STATION
RD	ROOF DRAIN
RL	ROOF LEADER
RP	RECIRCULATION PUMP
RPZ	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
S	SINK
SAN	SANITARY
SCO	STACK CLEANOUT
SP	SUMP PUMP
SS	SERVICE SINK
ST	STORAGE TANK
STM	STORM
TB	THRUST BLOCK
TD	TRENCH DRAIN
TP	TRAP PRIMER
TMV	THERMOSTATIC MIXING VALVE
T&P	TEMPERATURE & PRESSURE
TS	TAMPER SWITCH
U	URINAL
UT	UTILITY TUB
V	VENT
VB	VACUUM BREAKER
VTR	VENT THROUGH ROOF
WB	WASHER BOX
WC	WATER CLOSET
W.C.	WATER COLUMN
WCO	WALL CLEANOUT
WH	WALL HYDRANT
WS	WASH STATION
WS	WATER SOFTENER
X	EXISTING

PLUMBING LINETYPES

SYMBOL	DESCRIPTION
1"CW	UNDER SLAB COLD WATER PIPING WITH SIZE
1"CW	COLD WATER PIPING WITH SIZE
1"HW	HOT WATER PIPING WITH SIZE
1"HWR	HOT WATER RETURN PIPING WITH SIZE
1"SAN	UNDER SLAB SANITARY PIPING WITH SIZE
1"SAN	SANITARY PIPING WITH SIZE
1"V	UNDER SLAB VENT PIPING WITH SIZE
1"V	VENT PIPING WITH SIZE
1"GR	UNDER SLAB GREASE PIPING WITH SIZE
1"GRV	UNDER SLAB GREASE VENT PIPING WITH SIZE
1"GRV	GREASE VENT PIPING WITH SIZE
1"AW	UNDER SLAB ACID WASTE PIPING WITH SIZE
1"AW	ACID WASTE PIPING WITH SIZE
1"AV	UNDER SLAB ACID VENT PIPING WITH SIZE
1"AV	ACID VENT PIPING WITH SIZE
1"RL	ROOF LEADER PIPING WITH SIZE
1"STM	UNDER SLAB STORM WITH SIZE
1"G	UNDER SLAB GAS PIPING WITH SIZE (SLEEVED)
1"G	GAS PIPING WITH SIZE
1"TW	TEMPERED WATER PIPING WITH SIZE
	FIRE PROTECTION PIPE
1"CA	COMPRESSED AIR PIPING WITH SIZE
1"VAC	VACUUM PIPING WITH SIZE

GENERAL NOTES - PLUMBING:

A. CONSTRUCTION PHASING: ALL WORK SHALL BE COORDINATED AND SCHEDULED WITH THE GENERAL CONTRACTOR, OTHER TRADES, THE OWNER, RELATED UTILITY COMPANIES SHALL COINCIDE WITH CONSTRUCTION PHASING PER THE ARCHITECTURAL DOCUMENTS. CONTACT THE ARCHITECT/ENGINEER IN THE EVENT OF A CONFLICT.

B. NEW UTILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NEW UTILITY SERVICES AND COSTS UNDER THIS CONTRACT. COORDINATE AND SCHEDULE ALL RELATED WORK WITH THE UTILITY COMPANIES.

C. MAINTAIN SITE UTILITIES: THE CONTRACTOR SHALL MAINTAIN ALL EXISTING SITE UTILITIES AT ALL TIMES. THE CONTRACTOR SHALL WORK CONTINUOUSLY TO RESTORE ANY OUTAGE. SCHEDULED SHUT-DOWNS SHALL REQUIRE 48 HOUR PRIOR NOTIFICATION WITH OWNER. COORDINATE ALL RELATED WORK WITH THE OWNER AND THE UTILITY COMPANIES AS REQUIRED.

D. VERIFY UTILITIES: FIELD VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITIES WHERE REQUIRED FOR CONNECTIONS OF NEW WORK PRIOR TO CONSTRUCTION AND FABRICATION. DOCUMENT ON THE AS-BUILT DRAWINGS; THE TYPE, SIZE, MATERIAL, LOCATION AND INVERT ELEVATIONS OF ALL UTILITIES ENCOUNTERED. COORDINATE ALL RELATED WORK WITH ALL PARTIES INVOLVED. CONTACT THE ENGINEER IN THE EVENT OF A CONFLICT.

E. CONTACT B.U.D.: THE EXISTING UTILITIES, EQUIPMENT, AND PIPING SHOWN ON THESE DRAWINGS ARE FROM RECORD DRAWINGS AND VISUAL INSPECTION OF THE SITE. THE NUMBER, LOCATION, SIZE, AND TYPE OF UTILITIES SHOWN ARE APPROXIMATE, AND THERE MAY BE OTHER UTILITIES NOT SHOWN. THE CONTRACTOR SHALL CONTACT ALL AFFECTED UTILITY COMPANIES AND KENTUCKY B.U.D. PRIOR TO BEGINNING EXCAVATION.

F. PERMITS, TESTING, AND INSPECTIONS: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS, TESTING AND SCHEDULES INSPECTIONS.

G. REMOVAL OF EXISTING UTILITIES: REMOVE UNUSED/ABANDONED EQUIPMENT, PIPING, ETC. AS NECESSARY TO INSTALL THE NEW WORK. CAP THE ENDS OF ALL LINES AND ABANDONED IN PLACE.

H. TEMPORARY CONSTRUCTION HEAT: PROVIDE TEMPORARY HEAT IN CONSTRUCTION AREAS AS REQUIRED TO PREVENT FREEZING OF WATER PIPING DURING CONSTRUCTION.

I. PATCHING AND REPAIRING: PATCH AND REPAIR ALL AREAS WHERE WALLS, SLABS, PAVEMENT, CURBS, VEGETATION AND MATERIALS HAVE BEEN CUT, REMOVED, DISTURBED AND OR MODIFIED. MATCH EXISTING MATERIALS, RATINGS, AND FINISHES.

J. CUTTING EXISTING MATERIALS: CUTTING OF EXISTING PAVEMENT, SLABS, CONCRETE MASONRY, WALLS, ETC. SHALL BE SAW-CUT OR CORE DRILLED. NO "HAMMER DRILLING" WILL BE ALLOWED.

K. ROOFING PENETRATIONS: ALL ROOF PENETRATIONS SHALL BE IN COMPLIANCE WITH THE ROOFING MANUFACTURER'S GUIDELINES, THE AMERICAN ROOFING COUNCIL, AND MAINTAIN ALL WARRANTIES.

L. WALL PENETRATIONS: SEAL ALL PIPING PENETRATIONS THROUGH EXTERIOR WALLS WITH SILICONE SEALANT AS REQUIRED TO MAKE WATER/WEATHER TIGHT.

M. EXISTING WALL OPENINGS: EXISTING OPENINGS IN WALLS THAT ARE NOT BEING RE-USED SHALL BE PATCHED/CLOSED BY THE GENERAL CONTRACTOR.

N. NEW OPENINGS: NEW OPENINGS FOR PLUMBING PENETRATIONS THROUGH FIRE/SMOKE RATED WALLS, ASSEMBLIES AND SLABS SHALL BE BY THE GENERAL CONTRACTOR. THE PLUMBING CONTRACTOR SHALL COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS WITH THE GENERAL CONTRACTOR AND OTHER TRADES.

O. STRUCTURAL COORDINATION: THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL BELOW SLAB / UNDERGROUND PIPING WITH STRUCTURAL COMPONENTS AND COORDINATING ALL STEPPED FOOTINGS OR SLEEVES WHERE REQUIRED.

P. FIRE AND SMOKE STOPPING: ALL PLUMBING PENETRATIONS THROUGH FIRE/SMOKE RATED WALLS, ASSEMBLIES AND SLABS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. THE PLUMBING CONTRACTOR SHALL COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS WITH THE GENERAL CONTRACTOR AND OTHER TRADES.

Q. INSULATION: INSULATE ALL DOMESTIC HOT/COLD WATER, RECIRCULATION PIPING, AND ROOF LEADERS.

R. HAMMER ARRESTOR: ALL HAMMER ARRESTORS SHOWN ON FLOOR PLANS, BUT NOT ON RISERS OR VICE VERSA SHALL BE PROVIDED AND INSTALLED AS SHOWN ON BOTH.

S. VALVES: ALL VALVES SHOWN ON FLOOR PLANS, BUT NOT ON RISERS OR VICE VERSA, SHALL BE PROVIDED AND INSTALLED AS IF SHOWN ON BOTH.

T. ELECTRICAL PANELS AND EQUIPMENT: PLUMBING PIPING, SYSTEMS, AND EQUIPMENT SHALL BE INSTALLED TO MAINTAIN THE DEDICATED WORKING/ELECTRICAL SPACE ABOVE, BELOW, AND IN FRONT OF ELECTRICAL PANELS AND EQUIPMENT PER THE REQUIREMENTS OF THE N.E.C. (NATIONAL ELECTRIC CODE).

FIRE PROTECTION GENERAL NOTES

A. THIS PROJECT SITE IS IN SEISMIC DESIGN CATEGORY "C".

A.A. PERIODIC INSPECTIONS WILL BE MADE BY THE SPECIAL INSPECTIONS AGENT RETAINED FOR THIS PROJECT FOR THE ANCHORAGE OF ELECTRICAL EQUIPMENT FOR EMERGENCY OR STANDBY EQUIPMENT, PIPING SYSTEMS AND ASSOCIATED MECHANICAL UNITS DESIGNED TO CARRY HAZARDOUS MATERIALS INCLUDING WELDING SHOP GAS PIPING, ANCHORAGE OF DUCT SYSTEMS CARRYING HAZARDOUS MATERIALS INCLUDING EXHAUST SYSTEMS IN THE WELDING SHOP, AND FOR MECHANICAL VIBRATION ISOLATION SYSTEMS USED IN THE PROJECT.

A.B. ALL OTHER "QUALITY CONTROL" INSPECTIONS SPECIFIED IN THE MECHANICAL SECTIONS ARE NOT PROVIDED BY THE SPECIAL INSPECTOR.

B. REFER TO SPECIFICATIONS AND THE CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION.

C. ALL FIRE-SUPPRESSION WORK SHALL BE PERFORMED BY A LICENSED FIRE-SUPPRESSION CONTRACTOR WITH A MINIMUM OF 5 YEARS EXPERIENCE DESIGN AND ERECTING FIRE-SUPPRESSION SYSTEMS.

D. PROVIDE A COMPLETE FIRE-SUPPRESSION SYSTEM INCLUDING MODIFICATIONS TO EXISTING WORK, NEW PIPING AND ACCESSORIES, AND TESTING AS REQUIRED TO MEET ALL PROVISIONS OF THE KENTUCKY BUILDING CODE AND ALL APPLICABLE NFPA CODES.

E. THE FIRE-SUPPRESSION CONTRACTOR SHALL HYDRAULICALLY DESIGN AND SIZE THE MAIN SERVICE AND SPRINKLER SYSTEM TO FULLY PROTECT THE ENTIRE BUILDING IN COMPLIANCE WITH THE KENTUCKY BUILDING CODE, NFPA-13, NFPA-14, NFPA-20, NFPA-24, AND LOCAL CODES. THE FIRE-SUPPRESSION CONTRACTOR SHALL PROVIDE AND SUBMIT DRAWINGS AND HYDRAULIC CALCULATIONS TO THE MECHANICAL ENGINEER FOR REVIEW AND THE STATE FOR CODE APPROVAL.

F. FIRE-SUPPRESSION CONTRACTOR SHALL OBTAIN A COPY OF THE ENTIRE SET OF CONTRACT DOCUMENTS AND SHALL COORDINATE ROUTING AND INSTALLATION WITH ALL OTHER DISCIPLINES AND TRADES INCLUDING BUT NOT LIMITED TO CIVIL, ARCHITECTURAL, STRUCTURAL, PLUMBING, HVAC, AND ELECTRICAL IN THE LAY-OUT OF SPRINKLER PIPING AND HEADS. COORDINATE HEAD TYPES WITH ARCHITECTURAL CEILING TYPES. STRUCTURAL MEMBERS SHALL NOT BE CUT OR COMPROMISED IN ANY WAY. DO NOT MOUNT SPRINKLER HEADS OR HANG PIPING SO AS TO BLOCK ACCESS TO HVAC OR ELECTRICAL EQUIPMENT. DO NOT INSTALL PIPING OVER ELECTRICAL PANELS/SWITCHGEAR OR THE 36" CLEARANCE IN FRONT OF THESE ELECTRICAL ITEMS. COORDINATE ADDITIONAL REQUIREMENTS WITH NEC. FIRE-SUPPRESSION CONTRACTOR SHALL COORDINATE AND SCHEDULE ALL FIRE-SUPPRESSION WORK WITH THE GENERAL CONTRACTOR AND ACCOMMODATE CONSTRUCTION PHASING REQUIREMENTS AND ALL OTHER TRADES AS REQUIRED.

G. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL BELOW SLAB / UNDERGROUND PIPING WITH STRUCTURAL COMPONENTS AND COORDINATING ALL STEPPED FOOTINGS OR SLEEVES WHERE REQUIRED.

H. CENTER SPRINKLER HEADS (EACH WAY) IN CEILING TILES. SPRINKLER HEADS SHALL BE CENTERED IN 2'x 2' SECTIONS OF 2'x 4' CEILING TILES WHERE INSTALLED IN A LAY-IN CEILING. REFER TO FIRE-SUPPRESSION DETAILS FOR CLARIFICATION. REFER TO ARCHITECTURAL FOR FINAL REFLECTED CEILING PLANS TO CLARIFY CEILING TYPES AND CEILING GRIDS. COORDINATE HEAD LOCATIONS WITH LIGHTING AND AIR DEVICES.

I. INSTALL CAPPED DRAIN VALVES AND ANY AND ALL ADDITIONAL DRAIN VALVES AS REQUIRED TO COMPLETELY DRAIN THE FIRE-SUPPRESSION SYSTEM. INSTALL ALL REQUIRED DRAIN PIPING TO FLOW TEST POINTS. DISCHARGE ALL DRAIN PIPING TO OUTDOORS OR TO AN APPROVED LOCATION. PROVIDE LISTED AIR RELEASE FOR ALL TRAPPED RUNS OF FIRE-SUPPRESSION PIPING.

J. ALL FIRE-SUPPRESSION COMPONENTS INCLUDING BUT NOT LIMITED TO VALVES, PIPE, FITTINGS, CONTROL SYSTEMS, AND TRIM SHALL BE UL AND/OR FM LISTED FOR FIRE SERVICE AS REQUIRED BY THE KENTUCKY BUILDING CODE AND/OR THE AUTHORITY HAVING JURISDICTION.

K. PROVIDE GUARDS AND/OR SPECIAL HEADS AS REQUIRED FOR A COMPLETE AND FUNCTIONAL DESIGN AND INSTALLATION AND AS REQUIRED TO COMPLY WITH NFPA-13. PROVIDE HIGH TEMPERATURE HEADS FOR AREAS NEAR SPACE HEATING OUTLETS AND EQUIPMENT AS REQUIRED.

L. NEW OPENINGS FOR FIRE-SUPPRESSION ITEMS SHALL BE CUT, SLEEVED, ETC. BY THE FIRE-SUPPRESSION CONTRACTOR. ALL OPENINGS SHALL BE CORE DRILLED OR SAW-CUT. ALLOWED. NO HAMMER DRILLING

M. INSTALL FIRE/SMOKE STOPPING FOR ALL FIRE-SUPPRESSION PIPING PENETRATIONS THRU FIRE/SMOKE RATED ASSEMBLIES INCLUDING BUT NOT LIMITED TO PARTITIONS, WALLS, AND SLABS. ALL PENETRATION INSTALLATIONS SHALL BE CONSTRUCTED PER AN APPROVED UL AND/OR FM LISTED PENETRATION ASSEMBLY. THE FIRE-SUPPRESSION CONTRACTOR SHALL COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS FOR SPRINKLER PIPING WITH THE GENERAL CONTRACTOR AND OTHER TRADES AS REQUIRED FOR A COMPLETE INSTALLATION.

N. CERTAIN AREAS ON THE DRAWINGS MAY ILLUSTRATE A SPRINKLER HEAD TYPE AND/OR LOCATION. THE INTENT WITH THIS SCENARIO IS TO ILLUSTRATE CONCEPTUAL REQUIREMENTS. ANY ADDITIONAL HEADS THAT MAY BE REQUIRED TO COMPLY WITH NFPA-13 IS THE RESPONSIBILITY OF THE FIRE-SUPPRESSION CONTRACTOR. ALL AREAS NOT SHOWN TO BE SPRINKLERED BUT REQUIRED TO BE SPRINKLERED PER NFPA-13 SHALL BE SPRINKLERED IN COMPLIANCE WITH THE CONTRACT DOCUMENTS AND AS PART OF THE DELEGATED DESIGN AND INSTALLATION PROCESS.

PLUMBING FIXTURE SCHEDULE

MARK	MANUFACTURER	MODEL / TYPE	CONFIRM MODEL NUMBERS	CW	HW	TRAP	WASTE	VENT	MOUNTING	REMARKS
WC1A	AMERICAN STANDARD	3043.001 WATER CLOSET	FLUSH VALVE: SLOAN 111-XL-SMO SEAT: AMERICAN STANDARD 5901.100	1"	---	INTEGRAL	4"	2"	FLOOR SET: RIM 16-1/2"	ADA COMPLIANT, ELONGATED BOWL, TOP SPUD, 1.6G DC SENSOR FLUSH VALVE, HEAVY DUTY OPEN FRONT SEAT LESS COVER.
L1A	AMERICAN STANDARD	0355.012 ADA LAVATORY	FAUCET: AMERICAN STANDARD 6055.202 TRIM: 605XTMV1070 MIXING VALVE AND HOSE, CHROME PLATED GRID DRAIN, LOOSE KEY OPERATED SUPPLY STOPS, ADA COMPLIANT INSULATION WRAP.	1/2"	1/2"	1-1/4"	2"	2"	HEIGHT BY ARCHITECT	20-1/2 " X 18-1/4", VITREOUS CHINA, 4" CENTERS, BACK AND SIDE SPLASH, HEAVY DUTY CONCEALED ARM CARRIERS, 1.5 GPM DC POWERED ELECTRONIC PROXIMITY FAUCET.

SHERMAN CARTER BARNHART ARCHITECTS

SHROUT TATE WILSON MECHANICAL AND ELECTRICAL ENGINEERS
Lexington - Louisville - Charleston
www.stweng.com

SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

PLUMBING GENERAL NOTES, LEGEND & SCHEDULE

JOB NO.	2407
DATE	02/25/2025
DRAWN	LAP
CHECKED	NCM

REVISIONS

No.	Description	Date

SHEET

P0.1

2135
HARLAN INDEPENDENT SCHOOLS RENOVATION - PHASE III: ATHLETICS
4/12/2023 4:14:59 PM

GENERAL NOTES

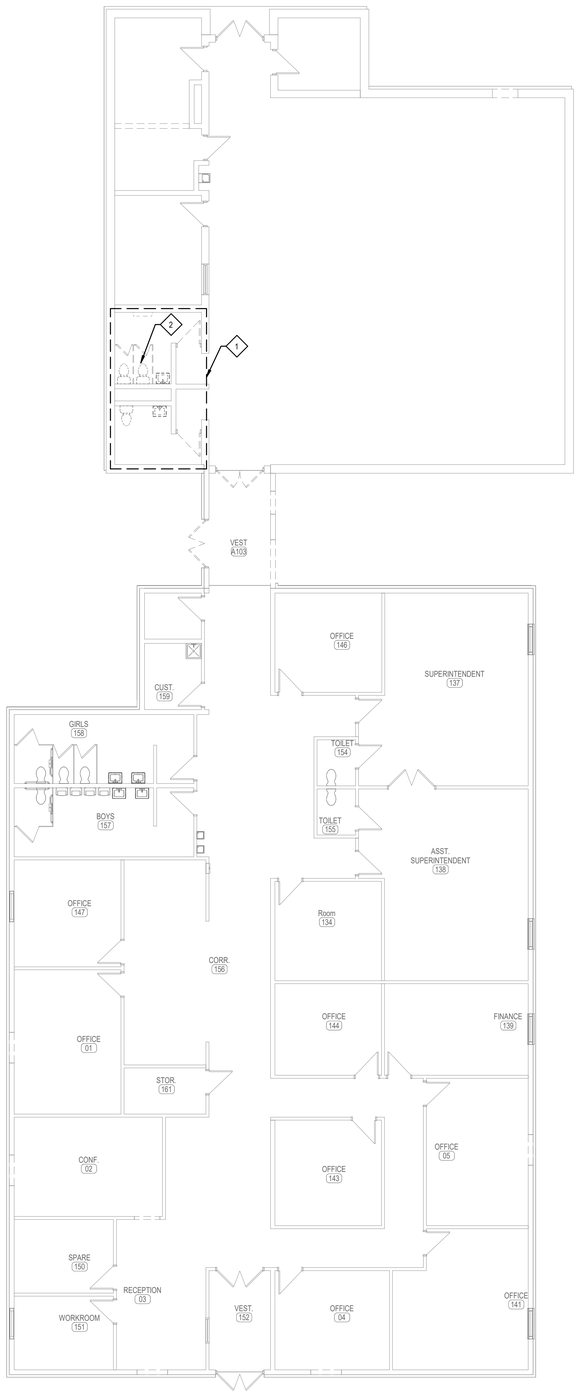
A. REFER TO DRAWING P0.1 FOR GENERAL PLUMBING NOTES.

◇ DEMOLITION KEYNOTES

1. ALL PLUMBING FIXTURES IN THIS AREA ARE TO BE REMOVED. PREPARE FOR NEW INSTALLATION.
2. REMOVE AND DEMOLISH EXISTING WATER CLOSET. CUT AND CAP SANITARY PIPING BELOW SLAB. CUT AND CAP WATER PIPING ABOVE CEILING.

⬡ NEW WORK KEYNOTES

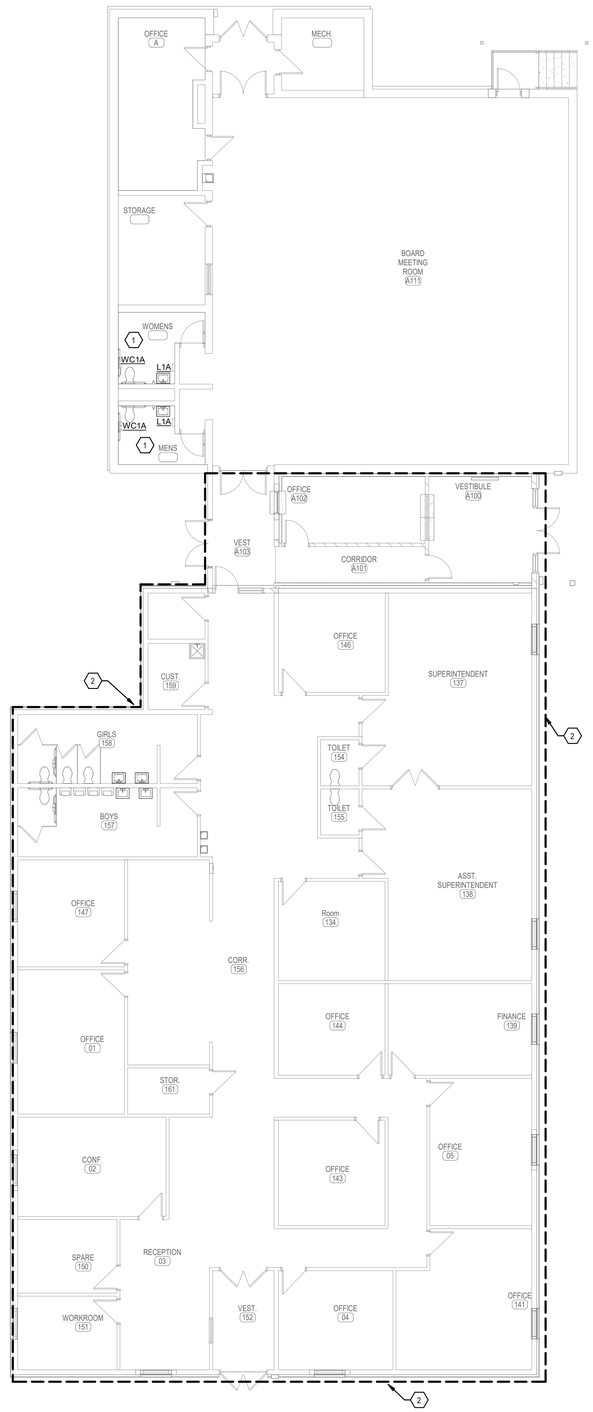
1. CONNECT NEW FIXTURES IN EXISTING LOCATION. RECONNECT TO SANITARY AND WATER PIPING. PROVIDE NEW CARRIERS AS REQUIRED.
2. ADJUST ROOF PLUMBING VENTS AS REQUIRED FOR ROOF WORK IN THIS AREA.



1 DEMOLITION PLAN - PLUMBING

SCALE: 1/8" = 1'-0"

0 4' 8' 16'



2 NEW WORK PLAN - PLUMBING

SCALE: 1/8" = 1'-0"

SHERMAN CARTER BARNHART ARCHITECTS

NICHOLAS C. MARTIN LICENSED PROFESSIONAL ENGINEER STATE OF KENTUCKY 02/27/2025

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SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATTION

110 REASOR AVENUE

TAYLORSVILLE, KENTUCKY

FLOOR PLANS - PLUMBING

JOB NO.	2407
DATE	02/25/2025
DRAWN	LAP
CHECKED	NCM

REVISIONS

No.	Description	Date

SHEET

P1.1

MECHANICAL LEGEND

HVAC	
SYMBOL	DESCRIPTION
	SUPPLY AIR DIFFUSER (4-WAY, 3-WAY, 2-WAY, 1-WAY)
	SUPPLY AIR DIFFUSER (ROUND)
	RETURN GRILLES
	EXHAUST GRILLES
	FLEXIBLE CONNECTION
	SUPPLY AIR DUCT (UP,- DOWN)
	RETURN AIR DUCT (UP,- DOWN)
	EXHAUST AIR DUCT (UP,- DOWN)
A.D.	ACCESS DOOR
	RECTANGULAR TO ROUND DUCTWORK TRANSITION
	RECTANGULAR TO RECTANGULAR TRANSITION
	DUCT CHANGE IN ELEVATION: R= RISE, D= DROP
BD	DUCT SIZE BACKDRAFT DAMPER (ARROW INDICATES FLOW DIRECTION)
FD	FIRE DAMPER
	MANUAL VOLUME CONTROL BALANCE DAMPER
SD	SMOKE DAMPER
M	MOTORIZED DAMPER
FD SD	COMBINATION - FIRE / SMOKE DAMPER
	ELBOW WITH TURNING VANES
	ELBOW ROUND
	CONNECT NEW TO EXISTING
	INDICATES AIR FLOW DIRECTION
GV	GATE VALVE (HORIZ. - VERT.)
GLV	GLOBE VALVE (HORIZ. - VERT.)
BFV	BUTTERFLY VALVE (HORIZ. - VERT.)
BV	BALL VALVE (HORIZ. - VERT.)
GV	CONTROL VALVE (2-WAY, 3-WAY)
	TRIPLE-DUTY VALVE
P	PRESSURE GAUGE
T	TEMPERATURE GAUGE / THERMOMETER
	PRESSURE REDUCING VALVE
	STRAINER
	CHECK VALVE
	FLOW INDICATOR
	BALANCE VALVE
	EXISTING PIPING/DUCT/EQUIPMENT TO REMAIN
	EXISTING PIPING/DUCT/EQUIPMENT TO BE REMOVED
	CAP OR PLUG
	PIPE DOWN, PIPE UP
	INCREASER / REDUCER
FS	FLOW SWITCH (FS)
FM	FLOW METER (FM)(DDC)
TS	TEMPERATURE SENSOR (TS)(DDC)
PS	PRESSURE SENSOR (TS)(DDC)
	MANUAL AIR VENT
	AUTOMATIC AIR VENT
T	ROOM THERMOSTAT OR DUCT STAT
S	SENSOR (CO, CO2, ETC.)
H	HUMIDISTAT
XXX XXX	SUPPLY AIR DEVICE (S-1) / AIRFLOW (CFM)
XX.XX	EQUIPMENT IDENTIFICATION
X MX.XX	DETAIL NO./ SHEET NO.
X MX.XX	SECTION NO / SHEET NO.
XX	INDICATED TAG OR SHEET NOTE
XX	DEMOLITION NOTE
##	REVISION TAG
	EXTENT OF DEMOLITION
	EXPANSION JOINT

HVAC	
SYMBOL	DESCRIPTION
	PIPE ANCHOR
	COMBINATION FLOW INDICATOR / BALANCING (4"-SMALLER)
30"	COMBINATION FLOW INDICATOR / BALANCING (5"-LARGER)
	TEMP./ PRESS. RELIEF VALVE
	FLANGED CONNECTION
	UNION
	FLEXIBLE CONNECTION
	PUMP

HVAC	
SYMBOL	DESCRIPTION
CD	CONDENSATE DRAIN LINE
CWR	CHILLED WATER RETURN PIPING
CWS	CHILLED WATER SUPPLY PIPING
EA	EXHAUST AIR DUCTWORK
HR	HYDRONIC RETURN PIPING
HS	HYDRONIC SUPPLY PIPING
HPR	HIGH PRESSURE RETURN
HPS	HIGH PRESSURE STEAM
HWR	HOT WATER RETURN PIPING
HWS	HOT WATER SUPPLY PIPING
LPR	LOW PRESSURE RETURN
LPS	LOW PRESSURE STEAM
MPR	MEDIUM PRESSURE RETURN
MPS	MEDIUM PRESSURE STEAM
OA	OUTSIDE AIR DUCTWORK
R	REFRIGERANT LINE SET PIPING
RA	RETURN AIR DUCTWORK
SA	SUPPLY AIR DUCTWORK

ABBREVIATIONS	
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU-X	AIR HANDLING UNIT
AS-X	AIR SEPARATOR
ATV	AUTO. TEMPERING VALVE
B-X	BOILER
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
C	COMMON
CAS-X	VARIABLE REFRIGERANT CASSETTE UNIT
CFM	CUBIC FEET PER MINUTE
CH-X	CHILLER
CT-X	COOLING TOWER
CU-X	CONDENSING UNIT
E-X	EXHAUST AIR DEVICE
EF-X	EXHAUST FAN DESIGNATION
EH-X	ELECTRIC HEATER
ERU-X	ENERGY RECOVERY UNIT
ESP	EXTERNAL STATIC PRESSURE
EXT-X	EXPANSION TANK
FC-X	CLOSED-CIRCUIT FLUID COOLER
FCU-X	FAN COIL UNIT
FZT	FREEZESTAT
GBD	GRAVITY BACKDRAFT DAMPER
GH-X	GRAVITY HOOD
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
HP-X	HEAT PUMP UNIT
HT-X	HEAT TRACE
HX-X	HEAT EXCHANGER
KH-X	KITCHEN HOOD
KW	KILOWATT
L-X	LOUVER DESIGNATION
MAU-X	MAKE-UP AIR UNIT
MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR
MOU-X	MINISPLIT OUTDOOR UNIT
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
P-X	PUMP
PRV	PRESSURE REDUCING VALVE
R-X	RETURN AIR DEVICE
RH-X	RADIANT HEATER
RTU-X	ROOFTOP UNIT
S-X	SUPPLY AIR DEVICE
SF-X	SUPPLY FAN DESIGNATION
SP	TOTAL STATIC PRESSURE
T-X	TRANSFER AIR DEVICE
VAV-X	VARIABLE AIR VOLUME BOX
VEF-X	VEHICLE EXHAUST FAN
X	EXISTING

GENERAL NOTES:

A. REFER TO SPECIFICATIONS AND THE CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

B. ALL MECHANICAL WORK SHALL BE PERFORMED BY A LICENSED MECHANICAL CONTRACTOR.

C. ALL WORK SHALL BE COORDINATED AND SCHEDULED WITH THE CONSTRUCTION MANAGER (CM) OR GENERAL CONTRACTOR (GC), OTHER TRADES, THE OWNER, AND RELATED UTILITY COMPANIES. ALL WORK SHALL COINCIDE WITH THE CONSTRUCTION PHASING PER THE CONTRACT DOCUMENTS OR CONSTRUCTION DOCUMENTS AND/OR AS MODIFIED BY THE CM/GC AND APPROVED BY THE OWNER AND DESIGN TEAM. THE MECHANICAL CONTRACTOR SHALL COORDINATE AND DEVELOP A PHASING PLAN WHERE ONE IS NOT EXPLICITLY SHOWN AND SHALL ENSURE THAT SAID PHASING PLAN IS APPROVED PRIOR TO PROCEEDING WITH WORK. ANY AND ALL DEMOLITION SHALL NOT PERMIT INTERRUPTION OF SERVICE IN AN OCCUPIED BUILDING UNLESS COORDINATED AND APPROVED.

D. ALL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENTS OR GEOMETRICAL RELATIONSHIPS OF DUCTWORK, PIPING, EQUIPMENT, AND SERVICES. THEY ARE NOT INTENDED TO SPECIFY OR SHOW EVERY OFFSET, SEQUENCE, DEVICE, OPTION, FITTING, VALVE, OR COMPONENT. CONTRACTOR TO PROVIDE ANY ADDITIONAL DUCT OR PIPING OFFSETS AND/OR FITTINGS, INCLUDING DIVIDED DUCTS AND FLATTENED DUCTS, REQUIRED FOR PROPER INSTALLATION AND TO MAINTAIN CLEARANCES AS ENCOUNTERED IN THE FIELD.

E. THE MECHANICAL CONTRACTOR SHALL OBTAIN A COPY OF THE ENTIRE SET OF CONTRACT DOCUMENTS PRIOR TO BID AND SHALL COORDINATE ROUTING AND INSTALLATION OF MECHANICAL DUCTWORK, PIPING, AND EQUIPMENT WITH ALL OTHER DISCIPLINES AND TRADES INCLUDING BUT NOT LIMITED TO CIVIL, ARCHITECTURAL, STRUCTURAL, FIRE SUPPRESSION, PLUMBING, AND ELECTRICAL.

F. REFER TO THE ENTIRE SET OF CONTRACT DOCUMENTS FOR DETAILS OF CONSTRUCTION AND INSTALLATION REQUIREMENTS. FURNISH ALL LABOR, MATERIAL, AND EQUIPMENT REQUIRED FOR COMPLETION AND OPERATION OF A FULLY FUNCTIONAL MECHANICAL SYSTEM AND IN ACCORDANCE WITH ALL APPLICABLE CODES AND STANDARDS INCLUDING BUT NOT LIMITED TO THE KENTUCKY BUILDING CODE, ASHRAE, IMC, IECC, SMACNA, AND NFPA.

G. THE EXACT LOCATIONS OF ALL EQUIPMENT, DUCTS, DIFFUSERS, ETC. SHALL BE COORDINATED WITH ALL OTHER TRADES. CEILING MOUNTED LIGHTING AND ELECTRICAL REQUIREMENTS TAKE PRECEDENCE OVER CEILING MOUNTED MECHANICAL EQUIPMENT. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING GRID AND LIGHTING LAYOUT FOR COORDINATION OF FINAL DIFFUSER LOCATIONS.

H. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING ALL BELOW SLAB / UNDERGROUND PIPING WITH STRUCTURAL COMPONENTS AND COORDINATING ALL STEPPED FOOTINGS OR SLEEVES WHERE REQUIRED.

I. THE MECHANICAL DRAWINGS REFLECT A "BASIS OF DESIGN" HVAC SYSTEM THAT HAS BEEN DESIGNED AROUND SPECIFIC PRODUCTS/MANUFACTURERS (SEE SCHEDULES). THE SELECTION OF A "BASIS OF DESIGN" HAS INFLUENCED THE DESIGNS OF OTHER TRADES (ELECTRICAL, STRUCTURAL, ETC.). THE CONTRACTOR MAY USE "NON-BASIS OF DESIGN" PRODUCTS/MANUFACTURER'S AS PERMITTED BY THE SPECIFICATIONS AND/OR CONTRACT DOCUMENTS. COORDINATION OF ALL MODIFICATIONS TO EACH DISCIPLINE WHICH RESULT FROM THE USE OF "NON-BASIS OF DESIGN" EQUIPMENT OR MATERIALS SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. IF "NON-BASIS OF DESIGN" MANUFACTURERS, SIZES, OR MODEL NUMBERS ARE BID, SUBMITTED, OR INSTALLED; IT IS THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR AND ALL OF HIS OR HER SUBCONTRACTORS TO COORDINATE ALL DIFFERENCES PRIOR TO BID. ALL COSTS OF ALL TRADES ASSOCIATED WITH THE USE OF "NON-BASIS OF DESIGN" EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR AND SHALL BE INCLUDED IN THE BID. SUBSEQUENTLY, ANY ADDITIONAL COST BORE BY THE ENGINEER (MECHANICAL, ELECTRICAL, ETC) TO ACCOMMODATE "NON-BASIS OF DESIGN" EQUIPMENT SHALL BE BORE BY THE CONTRACTOR AND PAID TO THE ENGINEER OF RECORD DURING SUBMITTALS.

J. EQUIPMENT OR MATERIALS AS ALLOWED BY THE SPECIFICATIONS AND/OR CONTRACT DOCUMENTS, WHICH ARE INSTALLED AND SUBSEQUENTLY VIEWED UNSATISFACTORY BY THE OWNER AND/OR ENGINEER WITHIN THE WARRANTY PERIOD, SHALL BE REMOVED COMPLETELY BY THE CONTRACTOR AND REPLACED WITH THE ORIGINAL DESIGN OR CORRECTED AS DIRECTED BY THE ENGINEER WITHOUT ADDITIONAL COST TO THE OWNER.

K. CONTRACTOR SHALL VISIT THE JOB SITE, FIELD VERIFY FIT, COORDINATE WITH OTHER TRADES, AND BECOME FAMILIAR WITH ALL PROJECT CONDITIONS PRIOR TO FABRICATING DUCTWORK, INSTALLING EQUIPMENT, ETC. NO ALLOWANCES WILL BE MADE FOR LACK THEREOF.

L. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION AND COSTS FOR ALL PERMITS, TESTING, AND INSPECTIONS.

M. CONTRACTOR TO REMOVE UNUSED/ABANDONED HVAC SYSTEMS AND EQUIPMENT UNLESS INDICATED OTHERWISE ON THE CONTRACT DOCUMENTS.

N. COORDINATE WITH THE CONTRACT DOCUMENTS AND PROVIDE TEMPORARY HEAT AS REQUIRED.

O. INFORMATION AND COMPONENTS SHOWN ON RISER DIAGRAMS OR DETAILS BUT NOT SHOWN ON PLANS AND VICE VERSA, SHALL BE PROVIDED AS IF REQUIRED BY BOTH.

P. THE ENTIRE MECHANICAL INSTALLATION SHALL BE AS REQUIRED TO MAINTAIN FIRE/SMOKE RATINGS AND/OR "UL" ASSEMBLY RATINGS AS REQUIRED BY THE CONTRACT DOCUMENTS AND AS SHOWN ON THE ARCHITECTURAL AND MECHANICAL DRAWINGS. SEAL AROUND ALL PENETRATIONS THROUGH ALL FIRE/SMOKE SEPARATIONS AND/OR "UL" RATED ASSEMBLIES. COORDINATE ALL PENETRATIONS WITH THE CONSTRUCTION MANAGER AND/OR GENERAL CONTRACTOR. PROVIDE ADDITIONAL FIRE DAMPERS, SMOKE DETECTORS, AND SMOKE DAMPERS (INCLUSIVE OF WIRING) AS REQUIRED FOR A FULLY FUNCTIONAL AND CODE COMPLIANT SYSTEM.

Q. ALL DUCTWORK, PIPING, AND MECHANICAL EQUIPMENT SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE. NO OTHER TRADES, I.E. ELECTRICAL, CEILING, PLUMBING, ETC., SHALL BE SUSPENDED, HUNG, OR SUPPORTED FROM MECHANICAL DUCTWORK OR MECHANICAL PIPING.

R. ALL BUILDING PENETRATIONS MUST BE COORDINATED WITH THE ARCHITECT AND SHALL BE FLASHED AND SEALED WEATHER-TIGHT. ALL MATERIALS AND COLORS MUST BE PRE-APPROVED BY THE ARCHITECT. NEW OPENINGS AND/OR PENETRATIONS FOR MECHANICAL ITEMS SHALL BE CUT, SLEEVED, ETC. BY THE MECHANICAL CONTRACTOR. ALL OPENINGS SHALL BE CORE DRILLED OR SAW-CUT. NO "HAMMER DRILLING" WILL BE ALLOWED.

S. ROUTE DUCTWORK AS HIGH AS POSSIBLE TO FACILITATE ACCESS TO ABOVE CEILING SPACE. COORDINATE ROUTING WITH OTHER SERVICES AND TRADES. PROVIDE ADDITIONAL DUCTWORK, OFFSETS, ETC. TO ACCOMMODATE FIELD CONDITIONS AS REQUIRED FOR A COMPLETE AND FUNCTIONING SYSTEM AT NO ADDITIONAL COST. ADDITIONAL OFFSETS REQUIRE APPROVAL FROM THE ENGINEER. ROUTE DUCTWORK BETWEEN JOISTS WHERE POSSIBLE.

T. ALL AIR DEVICES LOCATED ABOVE GYPBOARD OR HARD CEILINGS SHALL HAVE ACCESSIBLE BALANCING DAMPERS.

U. ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED PER SMACNA HVAC DUCT CONSTRUCTION STANDARDS.

V. PROVIDE AND INSTALL DUCT ACCESS DOORS FOR INSPECTION OF ALL INSTALLED FIRE DAMPERS AS DIRECTED BY SMACNA HVAC CONSTRUCTION STANDARDS.

W. MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 5'-0". ALL FLEXIBLE DUCT SHALL CONFORM TO THE REQUIREMENTS OF UL 181 FLEXIBLE AIR DUCTS. SUPPORT TO ELIMINATE SAGGING AND KINKING. INSULATED FLEXIBLE DUCTS SHALL MEET MINIMUM R-VALUES REQUIRED BY THE IECC.

X. ALL HVAC EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S REQUIREMENTS. UTILIZE FACTORY FILTERS DURING CONSTRUCTION.

Y. THE MECHANICAL CONTRACTOR SHALL BALANCE SYSTEM TO AIR QUANTITIES INDICATED ON PLANS AND PROVIDE OWNERS REPRESENTATIVES WITH COMPLETE NEBB/AABC BALANCE REPORT. THE MECHANICAL CONTRACTOR SHALL PROVIDE AS MANY ADDITIONAL SITE VISITS BY THE LICENSED TAB CONTRACTOR AS REQUIRED BY THE ENGINEER FOR A COMPLETE AND FUNCTIONING AND APPROVED SYSTEM IN COMPLIANCE WITH THE CONTRACT DOCUMENTS.

Z. ALL RECTANGULAR 90 DEG. AND 45 DEG. ELBOWS SHALL HAVE TURNING VANES.

AA. PROVIDE A MANUAL VOLUME DAMPER AT ALL BRANCH TAKE-OFFS ON SUPPLY, RETURN, AND OUTSIDE AIR DUCTWORK AT NO ADDITIONAL COST. PROVIDE A MAIN RETURN DAMPER UPSTREAM OF OUTSIDE AIR CONNECTIONS IN RETURN AIR PLENUM DESIGNS. COORDINATE ADDITIONAL MANUAL VOLUME DAMPER LOCATIONS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM WITH THE ENGINEER PRIOR TO ORDER, FABRICATION, OR INSTALLATION.

AB. ALL DUCT DIMENSIONS SHOWN ARE INTERIOR "CLEAR" DUCT DIMENSIONS.

AC. MAINTAIN 10'-0" MINIMUM CLEARANCE BETWEEN OUTDOOR AIR INTAKES AND EXHAUST, PLUMBING VENTS, ETC. AND/OR AS REQUIRED BY IMC, WHICHEVER IS MORE STRINGENT.

AD. MAINTAIN 10'-0" MINIMUM CLEARANCE FROM EDGE OF ROOFTOP EQUIPMENT TO ROOF EDGE UNLESS RAILING OR PARAPET OF SUFFICIENT HEIGHT IS TO BE PROVIDED IN ACCORDANCE WITH ALL APPLICABLE CODES INCLUDING BUT NOT LIMITED TO: IBC, IMC, LOCAL CODES, OSHA GUIDELINES (WHERE APPLICABLE). REFER TO ARCHITECTURAL.

AE. PROVIDE CONDUIT, BOXES AND CONTROL WIRING IN COMPLIANCE WITH THE NEC AND DIVISION 26.

AF. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND DRAWINGS FOR CONNECTIONS AND LOCATION OF ALL EQUIPMENT.

AG. CONTRACTOR SHALL PROVIDE ADDITIONAL OFFSETS OR BENDS IN PIPING AS REQUIRED TO ALLOW FOR EXPANSION AND CONTRACTION DUE TO TEMPERATURE CHANGES AND DIFFERENCES IN THE AMBIENT TEMPERATURE WHEN PIPING AND EQUIPMENT IS INSTALLED.

AH. PROVIDE MANUAL AIR VENTS AT HIGH POINTS AND DRAIN VALVES AT LOW POINTS OF ALL HYDRONIC PIPING. AUTOMATIC AIR VENTS SHALL BE INSTALLED WHERE INDICATED IN THE CONTRACT DOCUMENTS AND/OR AS REQUIRED FOR A FULLY FUNCTIONAL SYSTEM.

AI. MECHANICAL CONTRACTOR SHALL COORDINATE WITH THE ARCHITECTURAL PLANS AND GC/CM ALL AREAS WHERE MECHANICAL / ELECTRICAL EQUIPMENT AND DEVICES ARE INDICATED TO BE DEMOLISHED AND THE REQUIRED REPAIR AND RESTORATION OF ALL WALLS, ROOFS, CEILINGS, FLOORS, ETC. SHALL BE INCLUDED IN THEIR BID.

AJ. ALL ROOF PENETRATIONS SHALL BE IN COMPLIANCE WITH THE ROOFING MANUFACTURER'S GUIDELINES AND THE AMERICAN ROOFING COUNCIL. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE AS NECESSARY TO MAINTAIN ALL WARRANTIES.

AK. STRUCTURAL MEMBERS SHALL NOT BE CUT OR COMPROMISED IN ANY WAY.

AL. DO NOT BLOCK ACCESS TO HVAC OR ELECTRICAL EQUIPMENT. DO NOT INSTALL PIPING, DUCTWORK, OR EQUIPMENT OVER ELECTRICAL PANELS/SWITCHGEAR OR THE 30" x 42" (W x D) CLEARANCE IN FRONT OF THESE ELECTRICAL ITEMS. COORDINATE ADDITIONAL REQUIREMENTS WITH NEC.

GENERAL DEMOLITION NOTES:

A. GENERAL MECHANICAL DEMOLITION NOTES APPLY TO ALL MECHANICAL SHEETS.

B. SEE ARCHITECTURAL DRAWINGS FOR BUILDING FLOOR PLAN LAYOUT.

C. THE EXISTING CONDITIONS REPRESENTED ON PLANS DEPICT APPROXIMATE LOCATIONS AND SIZES OF EQUIPMENT AND COMPONENTS. FIELD-VERIFY ACTUAL CONDITIONS AND DETERMINE ACTUAL LOCATIONS AND SIZES OF EQUIPMENT PRIOR TO COMMENCING WORK.

D. SUBSTANTIAL DEVIATIONS BETWEEN THE CONTRACT DOCUMENTS DEMOLITION SCOPE AND ACTUAL CONDITIONS SHALL BE REPORTED TO THE ARCHITECT/ENGINEER IN THE FORM OF A REQUEST FOR INFORMATION WITH THE DESCRIPTIONS AND SKETCHES.

E. SCHEDULING OF ALL DEMOLITION OPERATIONS SHALL BE COORDINATED WITH OWNER NO LATER THAN THE DATE OF THE PROJECT PRECONSTRUCTION MEETING.

F. PROVIDE DEMOLITION WORK SHOWN ON THE DRAWINGS AND ALL INCIDENTAL DEMOLITION WORK REQUIRED TO COMPLETE NEW CONSTRUCTION WORK.

G. PROTECT EXISTING EQUIPMENT, PIPING, DUCTWORK, AIR OPENINGS, ETC. FROM DIRT AND DAMAGE DURING DEMOLITION AND CONSTRUCTION.

H. COMPLETELY REMOVE ALL COMPONENTS INDICATED ON PLANS FOR DEMOLITION INCLUDING REMOVAL OF ALL SUPPORTS, HANGERS, PIPING, WIRING, ECT. THAT ARE ASSOCIATED WITH THE COMPONENT BEING REMOVED, UNLESS OTHERWISE STATED.

I. CONTRACTOR SHALL PATCH AND REPAIR ALL DAMAGE ASSOCIATED WITH DEMOLITION. ALL FINISHED SURFACES (FLOORS, WALLS, CEILINGS, ROOF, ETC.) SHALL MATCH EXISTING CONDITIONS.

J. PROVIDE 1-HOUR FIRE RATED DUST PROOF BARRIERS (UL DESIGN U309) TO SEPARATE DEMOLITION AREA FROM THE REST OF THE FACILITY.

K. WHERE DUST CREATED DURING DEMOLITION MAY ENTER AN HVAC SYSTEM RETURN AIR DUCT, PROVIDE TEMPORARY FILTERS AS REQUIRED TO PREVENT DUST INTRUSION.

L. MAINTAIN OPERATION OF ALL EXISTING SERVICES AND UTILITIES SERVING AREAS THAT ARE OCCUPIED OR IN OPERATION DURING DEMOLITION WORK. COORDINATE AND SCHEDULE ALL DISRUPTIONS TO SERVICES OR UTILITIES WITH OWNER TWO WEEKS IN ADVANCE OF INTERRUPTION.

M. REMOVE, RELOCATE AND REINSTALL ANY COMPONENTS WHEN REQUIRED TO ACCOMMODATE DEMOLITION OR NEW WORK SCOPE. COMMUNICATE TO ARCHITECT/ENGINEER THE EXTENT OF ITEMS TO BE REMOVED PRIOR TO BEGINNING THE WORK.

N. STORE AND PROTECT ALL EXISTING ITEMS WHICH ARE TO BE RELOCATED OR REUSED.

O. WHERE DEMOLITION/RE-WORK OF EXISTING MEP ITEMS CONTAINING HAZARDOUS MATERIALS OCCUR, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER FOR ABATEMENT AND REMEDIATION AS REQUIRED.

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MECHANICAL LEGEND & GENERAL NOTES

JOB NO.	2407
DATE	02/25/2025
DRAWN	LAP
CHECKED	NCM

REVISIONS

No.	Description	Date

SHEET

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HARLAN INDEPENDENT SCHOOLS RENOVATION - PHASE III: ATHLETICS
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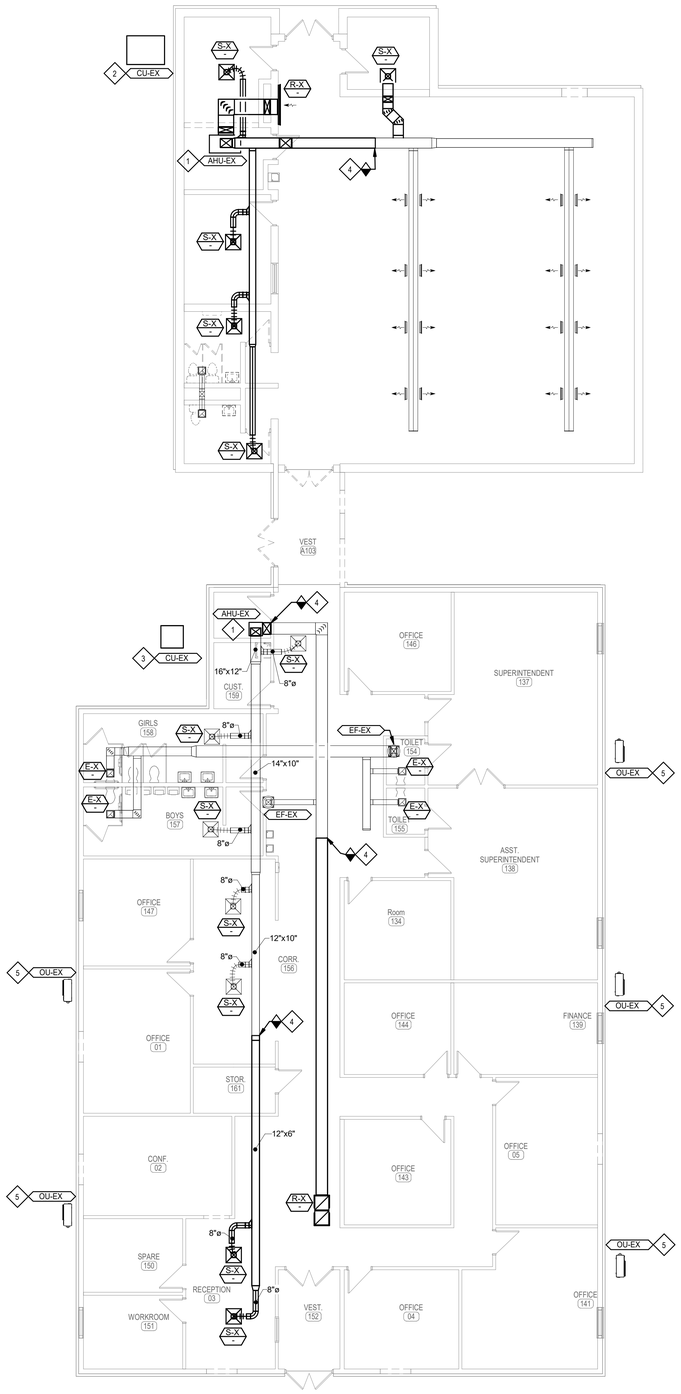

1 DEMOLITION PLAN - HVAC

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

GENERAL NOTES

A. REFER TO DRAWING M0.1 FOR GENERAL MECHANICAL NOTES.

SHEET KEYNOTES

1. DEMOLISH AND REMOVE EXISTING INDOOR AIR HANDLING UNIT. DEMOLISH EXISTING DUCT CONNECTIONS AS REQUIRED. DEMOLISH EXISTING REFRIGERANT PIPING TO OUTDOOR CONDENSING UNIT. PATCH AND REPAIR WALLS AS REQUIRED. DEMOLISH ALL EXISTING CONTROLS.
2. DEMOLISH AND REMOVE EXISTING OUTDOOR CONDENSING UNIT AND ASSOCIATED PIPING. PATCH AND REPAIR HOLES AS REQUIRED. DEMOLISH AND REMOVE EXISTING EQUIPMENT PAD.
3. DEMOLISH AND REMOVE EXISTING OUTDOOR CONDENSING UNIT. EXISTING HOUSEKEEPING PAD TO REMAIN IN PLACE FOR NEW UNIT. REMOVE REFRIGERANT PIPING AND PREPARE FOR NEW CONNECTIONS.
4. DEMOLISH AND REMOVE EXISTING DUCTWORK TO APPROXIMATE LOCATION. FIELD VERIFY PRIOR TO DEMOLITION.
5. EXISTING OUTDOOR CONDENSING UNIT TO REMAIN. ADJUST CONCRETE BASE AND ANGLE IRON STAND AS REQUIRED FOR NEW GRADING TO MAINTAIN ELEVATION OF CURRENT CONDENSING UNIT.

SHERMAN CARTER BARNHART ARCHITECTS

NICHOLAS C. MARTIN LICENSED PROFESSIONAL ENGINEER STATE OF KENTUCKY 02/27/2025

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DEMOLITION PLANS - MECHANICAL

JOB NO.	2407
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No.	Description	Date

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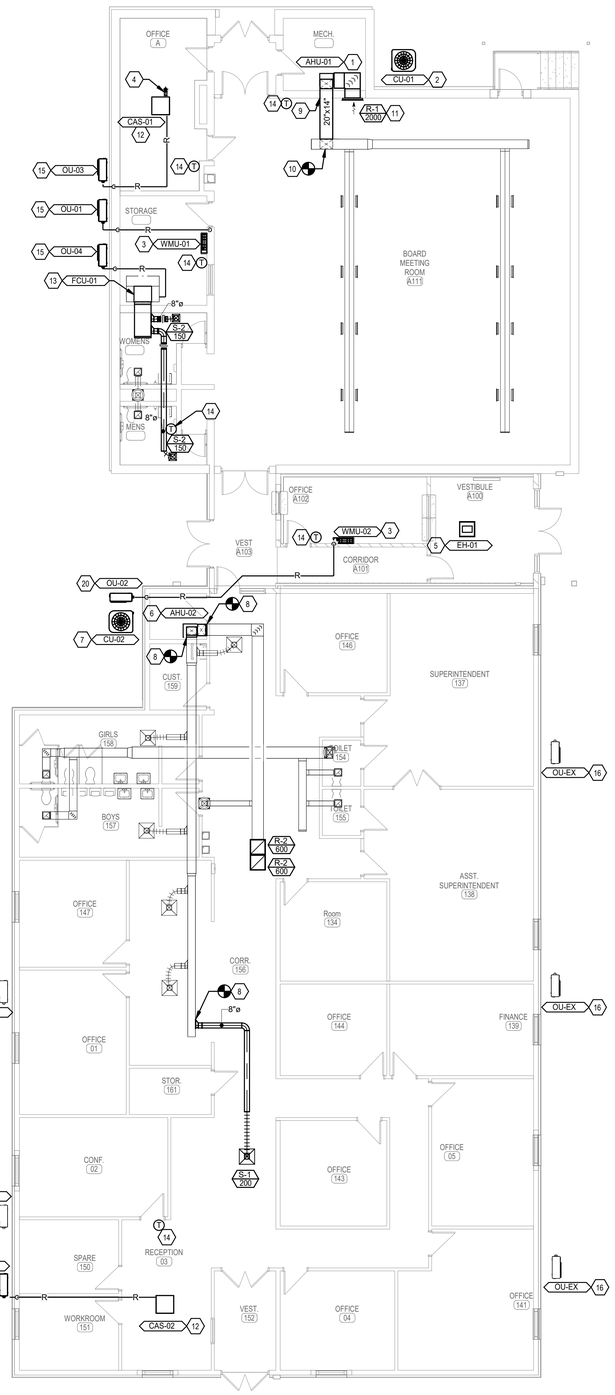
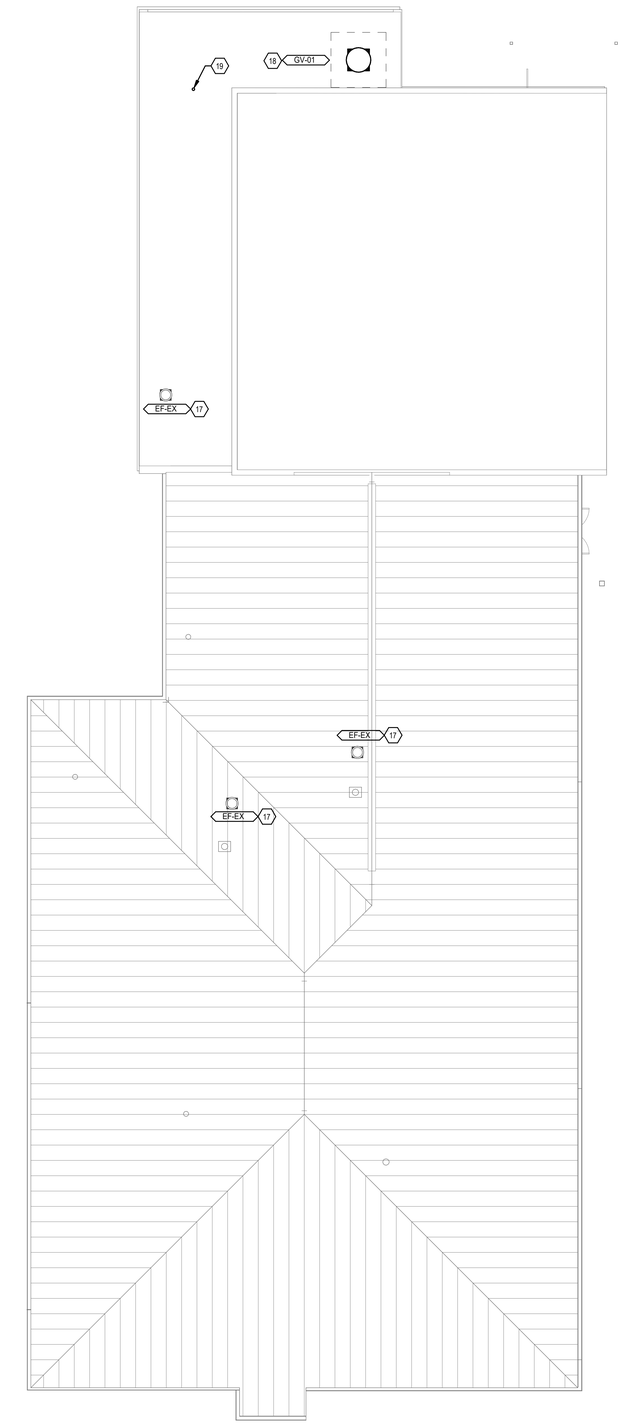


1 NEW WORK PLAN - HVAC

SCALE: 1/8" = 1'-0"

0 4' 8' 16'



2 ROOF PLAN - HVAC

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

GENERAL NOTES

A. REFER TO DRAWING M0.1 FOR GENERAL MECHANICAL NOTES.

SHEET KEYNOTES

1. INDOOR SPLIT SYSTEM AIR HANDLER WITH ELECTRIC HEATER. ROUTE CONDENSATE TO EXTERIOR FRENCH DRAIN. PROVIDE CONDENSATE PUMP AS REQUIRED. PROVIDE OUTSIDE AIR DUCTWORK UP TO GRAVITY VENT, GV-01, ON ROOF. PROVIDE WITH MOTORIZED DAMPER TO OPEN WHEN UNIT IS ACTIVELY HEATING OR COOLING.
2. OUTDOOR CONDENSING UNIT SHALL BE MOUNTED ON NEW CONCRETE PAD. PROVIDE ALL REQUIRED REFRIGERANT PIPING CONNECTIONS TO INDOOR AIR HANDLING UNIT. ROUTE REFRIGERANT PIPING THRU WALL AND SEAL ALL PENETRATIONS WEATHER-TIGHT. PROVIDE SLEEVE THROUGH WALL.
3. WALL MOUNTED MINI SPLIT UNIT. UNIT SHALL BE MOUNTED AT 7'-0" AFF. ROUTE ALL REFRIGERANT PIPING BACK TO UNIT SERVED. ROUTE CONDENSATE TO EXTERIOR FRENCH DRAIN. PROVIDE CONDENSATE PUMP AS REQUIRED.
4. PROVIDE OUTSIDE AIR DUCT CONNECTION TO CASSETTE UNIT. ROUTE DUCT UP THROUGH ROOF TO GOOSENECK FITTING.
5. CEILING MOUNTED ELECTRIC HEATER.
6. INDOOR SPLIT SYSTEM AIR HANDLER WITH ELECTRIC HEATER. RECONNECT TO EXISTING CONDENSATE PIPING. PROVIDE NEW CONDENSATE PUMP AS REQUIRED. PROVIDE WITH NEW THERMOSTAT IN EXISTING LOCATION.
7. OUTDOOR CONDENSING UNIT SHALL BE MOUNTED ON EXISTING CONCRETE PAD. PROVIDE ALL REQUIRED REFRIGERANT PIPING CONNECTIONS TO INDOOR AIR HANDLING UNIT. ROUTE REFRIGERANT PIPING THRU EXISTING WALL PENETRATION AND SEAL WEATHER-TIGHT. PROVIDE SLEEVE THROUGH WALL AS REQUIRED.
8. RECONNECT TO EXISTING DUCTWORK IN APPROXIMATE LOCATION. FIELD VERIFY PRIOR TO DEMOLITION.
9. ROUTE DUCT THROUGH WALL AS HIGH AS POSSIBLE. DUCT SHALL BE HELD TIGHT TO WALL AND STRUCTURE. PROVIDE WITH PAINT GRIP FINISH FOR FIELD PAINTING.
10. CONNECT DUCT INTO EXISTING DUCTWORK IN APPROXMIATE LOCATION. FIELD VERFIY. PROVIDE WITH PAINT GRIP FINISH FOR FIELD PAINTING.
11. RETURN GRILLE SHALL BE MOUNTED AS LOW AS POSSIBLE ON WALL. ROUTE DUCT BACK TO AIR HANDLING UNIT IN MECHANICAL ROOM. ARCHITECT TO SELECT COLOR.
12. CEILING MOUNTED CASSETTE MINI SPLIT UNIT. ROUTE CONDENSATE PIPING OUTSIDE TO FRENCH DRAIN. PROVIDE CONDENSATE PUMP AS REQUIRED. SEAL THRU WALL PENETRATIONS WEATHER-TIGHT.
13. CONCEALED DUCTED MULTI SPLIT UNIT. ROUTE ALL REFRIGERANT PIPING BACK TO UNIT SERVED. ROUTE CONDENSATE PIPING OUTSIDE TO FRENCH DRAIN. SEAL THRU-WALL PENETRATIONS WEATHER-TIGHT.
14. TEMPERATURE SENSOR SHALL BE MOUNTED AT 48" AFF. ROUTE CONTROLS BACK TO UNIT SERVED. ROUTE IN WALL WHERE POSSIBLE. PROVIDE WITH WIRE MOLD FOR EXISTING WALLS.
15. OUTDOOR CONDENSING UNIT SHALL BE MOUNTED ON ANGLE IRON STAND OR EQUAL PRE-MANUFACTURED STAND SIMILAR TO EXISTING. PROVIDE ALL REQUIRED REFRIGERANT PIPING CONNECTIONS TO INDOOR UNIT. ROUTE REFRIGERANT PIPING THRU-WALL AND SEAL ALL PENETRATIONS WEATHER-TIGHT. PROVIDE SLEEVE THROUGH WALL AS REQUIRED.
16. EXISTING OUTDOOR CONDENSING UNIT TO REMAIN IN PLACE.
17. REMOVE AND REINSTALL EXHAUST FAN AS REQUIRED FOR NEW ROOF WORK. COORDINATE PRIOR TO DEMOLITION..
18. GRAVITY VENT TO BE MOUNTED ON 14" ROOF CURB. MAKE DUCT CONNECTIONS DOWN TO AHU-01 BELOW.
19. 4"Ø OUTSIDE AIR DUCT TO TERMINATE AT GOOSENECK FITTING.
20. UNIT SHALL BE MOUNTED ON CONCERETE PAD WHERE INDICATED.

SHERMAN CARTER BARNHART ARCHITECTS

COMMONWEALTH OF KENTUCKY NICHOLAS C. MEYER LICENSED PROFESSIONAL ENGINEER 02/27/2025

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TAYLORSVILLE, KENTUCKY

NEW WORK PLANS - MECHANICAL

JOB NO.	2407
DATE	02/25/2025
DRAWN	LAP
CHECKED	NCM

REVISIONS

No.	Description	Date

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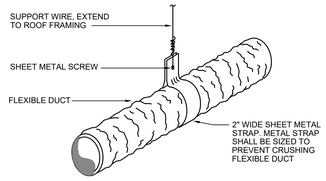
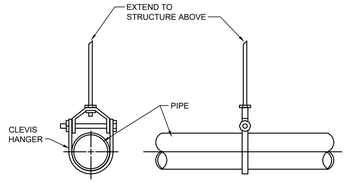


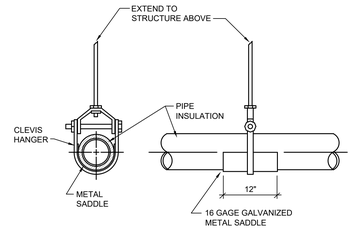
FLEXIBLE DUCT SUPPORT DETAILS

NOT TO SCALE



UNINSULATED PIPE HANGER DETAIL

NOT TO SCALE



INSULATED PIPE HANGER DETAIL

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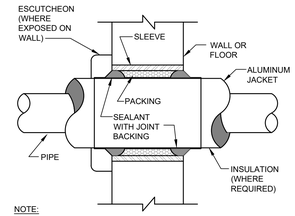


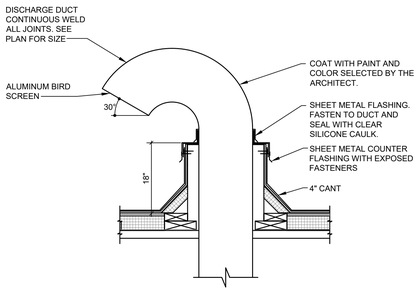
NOTE:

A. THIS DETAIL IS FOR NONFIRE-RATED CONSTRUCTION. PIPE PENETRATIONS IN FIRE-RATED CONSTRUCTION WHERE FIRE DAMPER IS NOT REQUIRED SHALL BE FIRESTOPPED WITH A UL-CLASSIFIED SYSTEM.

B. EXTEND SLEEVE 4" ABOVE FINISHED FLOOR FOR FLOOR SLAB PENETRATIONS. SEAL WATER-TIGHT.

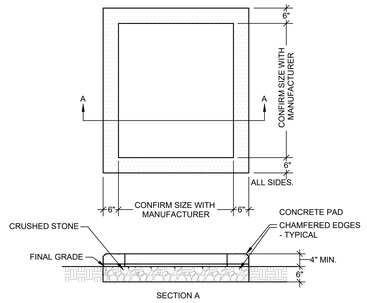
PIPE PENETRATION THROUGH WALLS AND FLOORS DETAIL

NOT TO SCALE



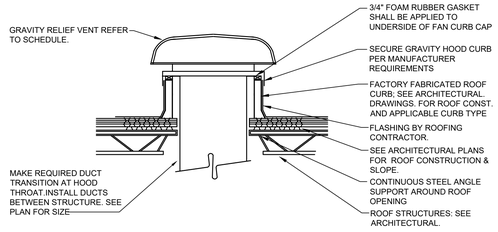
GOOSENECK DETAIL

NOT TO SCALE



CONCRETE PAD DETAIL

NOT TO SCALE



GRAVITY RELIEF VENT DETAIL

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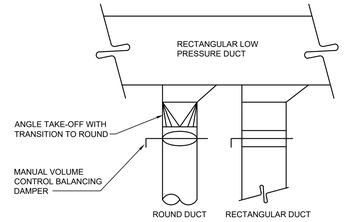
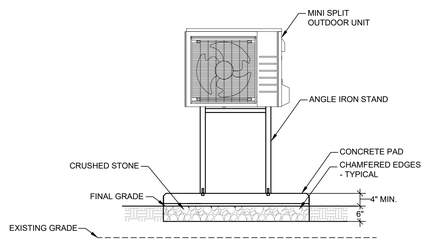


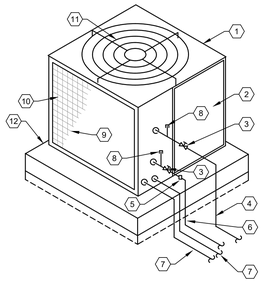
LOW PRESSURE BRANCH TAKE OFF DETAIL

NOT TO SCALE



OUTDOOR UNIT STAND DETAIL

NOT TO SCALE

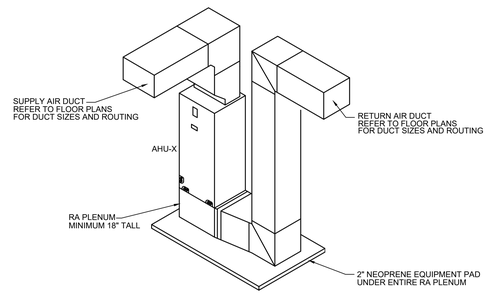


NOTES:

1. NEW CONDENSING UNIT.
2. COMPRESSOR ACCESS PANEL.
3. BACK-SEATED REFRIGERANT VALVE.
4. REFRIGERANT SUCTION LINE WITH INSULATION.
5. SIGHT GLASS WITH MOISTURE INDICATOR.
6. REFRIGERANT LIQUID LINE.
7. CONDUIT - POWER AND CONTROL.
8. REFRIGERANT GAUGE CONNECTION.
9. CONDENSER COIL.
10. COIL GUARD.
11. FAN GUARD.
12. 4" THICK CONCRETE PAD (#4 REBAR - 12" O.C. EACH WAY).

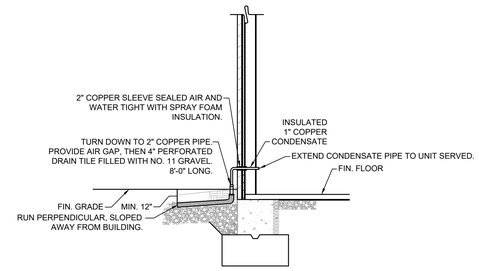
CONDENSING UNIT DETAIL

NOT TO SCALE



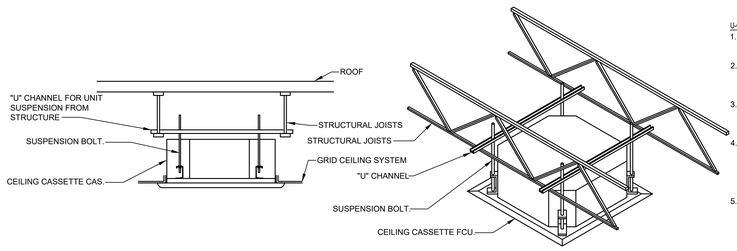
VERTICAL AIR HANDLER DETAIL

NOT TO SCALE



CONDENSATE DRAIN TO FRENCH DRAIN DETAIL

NOT TO SCALE



NOTES:
(REFER TO MANUFACTURERS INSTALLATION DETAILS FOR FURTHER CLARIFICATION INCLUDING PARTS AND ACCESSORIES REQUIRED FOR PROPER INSTALLATION)

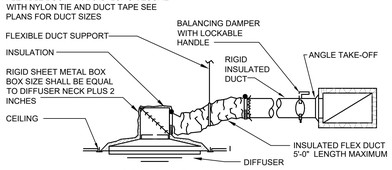
U-CHANNEL NOTES:

1. BASIS OF DESIGN IS UNISTRUT, APPROVED EQUIVALENT PRODUCTS ARE ACCEPTABLE.
2. FOR 4'-0" EXISTING JOIST SPACING OR LESS "U-CHANNEL" SHALL BE UNISTRUT A1000 CHANNEL OR A3301 BACK TO BACK CHANNEL.
3. FOR 4'-1" TO 6'-0" EXISTING JOIST SPACING "U-CHANNEL" SHALL BE UNISTRUT A5000 CHANNEL OR A1001 BACK TO BACK CHANNEL.
4. CHANNEL FRAMING MEMBERS SHALL BE POSITIVELY CONNECTED TO EXISTING JOISTS BY MECHANICAL CLIPS. ALL CLIPS AND ACCESSORIES REQUIRED FOR ATTACHMENT TO EXISTING STRUCTURE AND SUPPORT OF NEW EQUIPMENT SHALL BE INCLUDED IN BASE BID.
5. CHANNELS WITH GREATER LOAD CAPACITY MAY BE INSTALLED AT CONTRACTOR'S OPTION. FOR CHANNELS OTHER THAN THOSE NOTED ABOVE, MANUFACTURER'S LOAD TABLES SHALL BE SUBMITTED TO ARCHITECT FOR RECORD.

VRV CASSETTE UNIT MOUNTING DETAIL

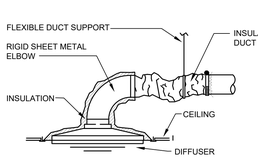
NOT TO SCALE

NOTE:
PROVIDE A MINIMUM OF FOUR (4) SHEET METAL SCREWS THRU 3-WRAPS OF DUCT TAPE TO SECURE FLEXIBLE DUCT TO THE SHEET METAL PRIOR TO INSTALLING THE 1/4" WIDE PLENUM RATED NYLON TIE. THE FLEXIBLE DUCT INSULATION SHALL BE SECURED WITH 3-WRAPS OF DUCT TAPE.

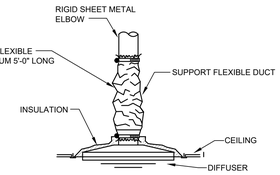


OPTION #1

NOTE:
ALL MATERIALS USED FOR DUCT CONNECTION MUST BE PLENUM RATED.



OPTION #2



OPTION #3

DIFFUSER RUNOUT DETAIL

NOT TO SCALE

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MECHANICAL DETAILS

JOB NO.	2407
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2435
HARLAN INDEPENDENT SCHOOLS RENOVATION - PHASE III: ATHLETICS
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MINI-SPLIT SYSTEM SCHEDULE

MARK	MANUFACTURER	MODEL	CONNECTED UNIT	CFM	SEER	COOLING CAPACITY @ 95/75F (BTU/hr)	SENS. COOLING CAPACITY @ 95/75F (BTU/hr)	HEATING CAPACITY (BTU/hr)	ELECTRICAL				WEIGHT (LBS)	REMARKS
									V/Ø/Hz	RLA	MCA	MOCP		
OUTDOOR UNIT														
OU-01	DAIKIN	RXF09AXVJU	WMU-01	1,051	21	9,000	8,290	10,000	208/1/60		9.3	15	60	1,2,3,4,7,8
OU-02	DAIKIN	RXF09AXVJU	WMU-02	1,051	21	9,000	8,290	10,000	208/1/60		9.3	15	60	1,2,3,7,8,12
OU-03	DAIKIN	RX09WMVJU	CAS-01	985	19.8	9,100	7,990	10,000	208/1/60	7.5	7.6	15	63	1,2,3,4,7,8
OU-04	DAIKIN	RX12WMVJU	FCU-01	1,105	14.6	10,800	8,430	13,600	208/1/60	7.5	7.7	15	63	1,2,3,4,7,8
OU-05	DAIKIN	RX12WMVJU	CAS-02	1,105	19.5	10,800	8,430	13,500	208/1/60	7.5	7.7	15	63	1,2,3,4,7,8
INDOOR UNIT														
WMU-01	DAIKIN	FTKF09AXVJU	OU-01	249-466	-	9,000	8,290	10,000	-	-	-	-	19.8	1,5,8,9,10
WMU-02	DAIKIN	FTKF09AXVJU	OU-02	249-466	-	9,000	8,290	10,000	-	-	-	-	19.8	1,5,8,9,10
CAS-01	DAIKIN	FFQ09W2VJU	OU-03	268-378	-	9,100	7,990	10,000	-	-	-	-	36	1,5,6,8,9
FCU-01	DAIKIN	FDMQ12WVJU	OU-04	261-371	-	10,800	8,430	13,600	-	-	-	-	36	1,5,8,9,11
CAS-02	DAIKIN	FFQ12W2VJU	OU-05	468-406	-	10,800	8,430	13,500	-	-	-	-	36	1,5,6,8,9

REMARKS
1. INSTALL PER MANUFACTURER'S INSTRUCTIONS.
2. HEAT PUMP UNIT
3. LOW AMBIENT COOLING/PROVIDE WIND BAFFLES
4. INSTALL ON EXTERIOR UNISTRUT STAND.
5. DACA-CP3-1 CONDENSATE PUMP OR SIMILAR.
6. CASSETTE UNIT WITH INTEGRAL CONDENSATE PUMP.
7. HAIL GUARDS.
8. PROVIDE SYSTEM WITH DKN PLUS BACNET INTERFACE.
9. INDOOR UNIT POWERED FROM OUTDOOR UNIT.
10. WALL MOUNTED UNIT.
11. DUCTED CONCEALED UNIT.
12 PROVIDE ON CONCRETE PAD.

OTHER ACCEPTABLE MANUFACTURERS INCLUDE: MITSUBISHI, TRANE . REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SPLIT SYSTEM SCHEDULE

MARK	MANUFACTURER	MODEL	CFM	SEER	COOLING CAPACITY MBH	HEATING CAPACITY MBH (KW)	HEATING HPSF	ELECTRICAL			REMARKS
								V/Ø/Hz	MCA	MOCP	
OUTDOOR UNIT											
CU-01	DAIKIN	DC3SEA6030A	-	13.8	55,500	-	-	208/3/60	20.5	35	2,4,5,8,9
CU-02	DAIKIN	DC3SEA3630A	-	13.4	34,200	-	-	208/3/60	14.2	25	2,4,5,8,9
INDOOR UNIT											
AHU-01	DAIKIN	AMST60DU1300A	2000	-	-	20	-	230/1/60	8.6	15	1,2,3,4,6,7,9
AHU-02	DAIKIN	AMST36CU1300A	1200	-	-	15	-	230/1/60	7.1	15	1,2,3,4,6,7,9

REMARKS:
1. PROVIDE WITH 7-DAY PROGRAMMABLE THERMOSTAT AND OUTDOOR TEMPERATURE SENSOR FOR EMERGENCY HEAT.
2. CONFIRM NEW REFRIGERANT REQUIREMENTS.
3. PROVIDE WITH CONDENSATE PUMP AS REQUIRED.
4. INSTALL PER MANUFACTURER'S INSTRUCTIONS
5. HEATING CAPACITY AND HPSF RATED AT 47°F
6. PROVIDE UNIT WITH SINGLE-POINT WIRING KIT AND UNIT-MOUNTED DISCONNECT.
7. INSTALL IN MECHANICAL CLOSET PER DRAWINGS. REFER TO DETAIL. ENSURE PROPER CLEARANCES.
8. INSTALL UNIT ON CONCRETE PAD.
9. ALL EQUIPMENT MUST BE ENERGY STAR RATED.

OTHER ACCEPTABLE MANUFACTURERS INCLUDE: TEMPSTAR, COLEMAN, LENNOX, CARRIER, JCI OR APPROVED EQUAL. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

AIR DEVICE SCHEDULE

MARK	MANUFACTURER	MODEL	MAX CFM	MODULE (INCHES)	AIR PATTERN	NECK (INCHES)	MAX NC	REMARKS
S-1	PRICE	SPD	300	24x24	4-WAY	8"Ø	20	1,3,4
S-2	PRICE	SPD	150	12x12	4-WAY	8"Ø	20	1,3,4
R-1	PRICE	530	2000	34x26	-	32x24	20	2,5,6
R-2	PRICE	530	1000	24x24	-	20x20	20	1,3,5

REMARKS:
1. LAY-IN TYPE
2. SURFACE/WALL MOUNTED GRILLE.
3. PROVIDE WITH WHITE FINISH.
4. REFER TO PLAN FOR THROW PATTERN
5. 45 DEG DEFLECTION.
6. CUSTOM COLOR BY ARCHITECT.

GENERAL NOTES:
COORDINATE AIR DEVICE LOCATIONS WITH REFLECTED CEILING PLANS PRIOR TO INSTALLATION. LIGHTING HAS PRIORITY OVER HVAC

ALL AIR DEVICES SHALL BE ALUMINUM CONSTRUCTION.

OTHER ACCEPTABLE MANUFACTURERS INCLUDE: KREUGER, TITUS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

ELECTRIC HEATER SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	CFM	BTUH	ELECTRICAL				REMARKS
						V/Ø/Hz	KW	MCA	MOCP	
EH-01	MARKEL	HF3386D-RP	CEILING	175	13,600.0	208/1/60	3	14.4	25	ALL

REMARKS:
1. INTEGRAL THERMOSTAT AND DISCONNECT
2. INTEGRAL DISCONNECT AND WALL THERMOSTAT
3. INSTALL IN CEILING
4. PROVIDE REQUIRED MOUNTING BRACKET FOR MOUNTING AS INDICATED ON PLANS

OTHER ACCEPTABLE MANUFACTURERS INCLUDE: Q-MARK, REDDI. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

GRAVITY HOOD SCHEDULE

MARK	MANUFACTURER	MODEL	INTAKE / EXHAUST	CFM	PRESSURE DROP (IN WG)	THROAT SIZE		SIZE	REMARKS
						WIDTH (IN)	LENGTH (IN)	HEIGHT (IN)	
GV-01	GREENHECK	GRSR	INTAKE	2000	0.06	24	24	23	ALL

REMARKS:
1. UNIT TO INCLUDE 13.5" HIGH INSULATED ROOF CURB. CONFIRM ROOF SLOPES PRIOR TO ORDERING
2. ALUMINUM CONSTRUCTION
3. SPUN ALUMINUM ROUND INTAKE

OTHER ACCEPTABLE MANUFACTURERS INCLUDE: RUSKIN, UNITED ENERTECH. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SHERMAN CARTER BARNHART ARCHITECTS

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MECHANICAL SCHEDULES

JOB NO.	2407
DATE	02/25/2025
DRAWN	LAP
CHECKED	NCM

REVISIONS

No.	Description	Date

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M6.1

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ELECTRICAL LEGEND

LIGHTING

SYMBOL	DESCRIPTION
	SURFACE MOUNTED LUMINAIRE (NORMAL & EMERGENCY)
	RECESSED LUMINAIRE (NORMAL & EMERGENCY)
X X	WALL MOUNTED LUMINAIRE (NORMAL AND EMERGENCY)
X X	RECESSED LUMINAIRE (NORMAL AND EMERGENCY)
X X	SURFACE MOUNTED LUMINAIRE (NORMAL AND EMERGENCY)
	LINEAR PENDANT LUMINAIRE (NORMAL AND EMERGENCY)
	CIRCULAR LUMINAIRE (NORMAL AND EMERGENCY)
	WALL BRACKET LUMINAIRE (NORMAL AND EMERGENCY)
	INDUSTRIAL STRIP LUMINAIRE (NORMAL AND EMERGENCY)
X	TRACK LUMINAIRE
	CEILING FAN
X	TWO-HEAD EMERGENCY LIGHTING UNIT
X X	EMERGENCY REMOTE HEAD (SINGLE OR DOUBLE)
X X	EMERGENCY EXIT SIGN WITH COMBINATION EMERGENCY LUMINAIRE WALL AND CEILING MOUNT
X X	EMERGENCY EXIT SIGN - SINGLE FACE WITH ARROWS AS INDICATED WALL AND CEILING MOUNTED
X X	EMERGENCY EXIT SIGN - DOUBLE FACE
X	POLE MOUNTED LUMINAIRE
X	FLOOD OR SPOT LUMINAIRE
X	BOLLARD OR POST TOP LUMINAIRE
LC-X	LIGHTING CONTROL RISER REFERENCE TAG
PC	PHOTOCELL
EP	EMERGENCY POWER PACK
EB	EMERGENCY BYPASS RELAY (UL924)
ET	EMERGENCY TRANSFER CONTROL (UL1008)
BP	BATTERY PACK
PP	LIGHTING CONTROL POWER PACK
PI	PORT INJECTOR
RP	LOW VOLTAGE LIGHTING RELAY PANEL
PA	PLUG LOAD CONTROL PACK
RC	ROOM CONTROLLER
NB	NETWORK BRIDGE
SC	SYSTEM CONTROLLER
UC	USER CONTROLLER
PS	POWER SUPPLY
TC	TIME CLOCK
C	CONTACTOR, POLES AS REQUIRED
S	RJ45 CONTROL WIRE SPLITTER
DA	DAYLIGHT SENSOR
OS DT	DUAL TECHNOLOGY LOW VOLTAGE CORNER MOUNTED OCCUPANCY SENSOR WITH POWER PACK AND CEILING MOUNT OR WALL MOUNT BRACKET AS SHOWN.
OS	DUAL TECHNOLOGY LOW VOLTAGE CEILING MOUNTED, 360° OCCUPANCY SENSOR
	LIGHTING CONTROL PANEL
$X	LIGHT SWITCH - SUBSCRIPT INDICATES THE FOLLOWING : 3 - 3 WAY, 4 - 4 WAY, K - KEY OPERATED, D - DIMMER, OS - LINE VOLTAGE OCCUPANCY SENSOR, L - LOW VOLTAGE, M - MANUAL MOTOR STARTER W/ HANDLE GUARD KIT AND PADLOCK. SEE LIGHTING CONTROL DIAGRAM SHEET FOR OTHER SUBSCRIPTS.

ONE LINE DIAGRAM

SYMBOL	DESCRIPTION
XXX	CIRCUIT BREAKER
GF	GROUND FAULT PROTECTION
VFD	VARIABLE FREQUENCY DRIVE
DMM	DIGITAL MONITORING METER
SPD	SURGE PROTECTION DEVICE
KWH	DIGITAL METER DISPLAY
M	POWER METERING DEVICE
	NON FUSED SWITCH
XXX	FUSED SWITCH
XXX	FUSE
	RELAY (NORMALLY OPEN)
XXX	PANEL
	DOUBLE THROW SWITCH OR TRANSFER SWITCH
H O A	3 POSITION SELECTOR SWITCH: LOCAL-OFF-REMOTE HAND-OFF-AUTOMATIC
	GROUND
	ELECTRIC HEATER

DEMOLITION vs EXISTING LINE WEIGHTS

DEMO	EXISTING

POWER

SYMBOL	DESCRIPTION
X	TAMPER RESISTANT DUPLEX RECEPTACLE - SUBSCRIPT INDICATES THE FOLLOWING : C - INSTALL 4 INCHES ABOVE COUNTER OR BACKSPLASH, CM - CEILING MOUNTED, E - EMERGENCY, G - GROUND FAULT CIRCUIT INTERRUPTER, GB - BLANK FACE GROUND FAULT INTERRUPT, IG - ISOLATED GROUND, P - SPLIT-WIRED PLUG LOAD CONTROL, WP - WEATHER PROOF, U - WITH USB PORT
X	TAMPER RESISTANT QUADRUPLEX RECEPTACLE
X	TAMPER RESISTANT SINGLE RECEPTACLE
X	TAMPER RESISTANT FLOOR MOUNTED RECEPTACLE AND COVERPLATE. SEE PLAN FOR CONFIGURATION.
X	COMBINATION FLOOR BOX WITH THREE DUPLEX RECEPTACLES AND RJ45 DATA JACKS. PROVIDE WITH COVERPLATE. INSTALL CATEGORY UTP WET LOCATION CABLES IN A 1 INCH CONDUIT FROM THE DATA COMPARTMENT TO THE NEAREST MDF OR IDF (X - INDICATES THE NUMBER OF JACKS AND CABLES)
	JUNCTION BOX
	HAND DRYER
	SAFETY SWITCH (SIZE/FUSING/POLES/NEMA - OPTIONAL)
	ENCLOSED CIRCUIT BREAKER DISCONNECT (SIZE/POLES/NEMA - OPTIONAL)
	COMBINATION MOTOR STARTER AND DISCONNECT (SIZE/FUSING/POLES/NEMA - OPTIONAL)
	MOTOR STARTER (SIZE/FUSING/POLES/NEMA - OPTIONAL)
	CONDUIT TURNED DOWN
	CONDUIT TURNED UP
	CONDUIT WITH END CAP
	EQUIPMENT CONNECTION
	CONDUIT CONTINUATION
X X	SURFACE MOUNTED PANELBOARD/DISTRIBUTION PANEL/AUTOMATIC TRANSFER SWITCH; X - INDICATES IDENTIFICATION
X	FLUSH MOUNTED PANELBOARD; X - INDICATES IDENTIFICATION
X X	EXISTING SURFACE MOUNTED PANELBOARD/DISTRIBUTION PANEL; X - INDICATES IDENTIFICATION
X	EXISTING FLUSH MOUNTED PANELBOARD; X - INDICATES IDENTIFICATION
	LOW-VOLTAGE CIRCUIT WITH CONDUCTOR TYPES AS REQUIRED BY THE MANUFACTURER FOR THE PARTICULAR SYSTEM.
	UTP LIGHTING CONTROL CABLE
	CIRCUIT CONNECTED TO EMERGENCY POWER
	SURFACE MOUNTED RACEWAY
4#8,1#10,1"C A-1	BRANCH CIRCUIT HOMERUN TO PANELBOARD. THE NUMBER OF TICK MARKS INDICATES THE NUMBER OF CONDUCTORS. LONG TICK MARKS REPRESENT UNGROUNDED CONDUCTORS. SHORT TICK MARKS REPRESENT GROUNDED CONDUCTORS (NEUTRAL). A GROUNDING CONDUCTOR (GROUND) SHALL BE INSTALLED WITH ALL CIRCUITS. TICK MARKS AND CONDUCTOR SIZES ARE ONLY SHOWN ON THE HOMERUN. INSTALL THE REQUIRED QUANTITY AND SIZE CONDUCTORS TO EACH DEVICE ON THE SAME CIRCUIT AS INDICATED ON THE DRAWINGS. MINIMUM CONDUCTOR SIZE = #12 MINIMUM CONDUIT SIZE = 3/4 INCH SUBSCRIPT EXAMPLE: 4#8 = (3) UNGROUNDED AND (1) NEUTRAL CONDUCTORS SIZE IF OTHER THAN #12 1#10 = GROUNDING CONDUCTOR SIZE IF OTHER THAN #12 1"C = CONDUIT SIZE A-1 = PANEL NAME - POLE POSITION IN PANEL
M	ELECTRICAL METER

SYSTEMS

SYMBOL	DESCRIPTION
▽	EXISTING COMMUNICATIONS OUTLET
WAP WAP	ROUGH-IN FOR FUTURE WIRELESS ACCESS POINT WITH 1" CONDUIT AND PULL STRING STUBBED ABOVE ACCESSIBLE CEILING. (WALL & CEILING)
#V/#D	ROUGH-IN FOR FUTURE VOICE/DATA OUTLET WITH 1" CONDUIT AND PULL STRING STUBBED ABOVE ACCESSIBLE CEILING - SUBSCRIPT INDICATES THE FOLLOWING: C - INSTALL 4 INCHES ABOVE COUNTER OR BACKSPLASH, CG - CEILING MOUNTED
	MULTIMEDIA OUTLET. 4-11/16 INCHES OUTLET BOX WITH TWO 1-1/4 INCH CONDUITS TO ABOVE ACCESSIBLE CEILING. (WALL & CEILING)
DR	DOOR RELEASE BUTTON
	INTERCOM SPEAKER (CEILING; RECESSED WALL-MOUNTED; HORN-TYPE WALL MOUNTED
	INTERCOM SPEAKER WITH INTEGRAL VOLUME CONTROL (CEILING & WALL MOUNT)
	SELF-AMPLIFIED SPEAKER (CEILING & WALL MOUNT)
J	J-HOOK PATHWAY
	SECURITY INTERCOM STATION
CR	SECURITY SYSTEM CARD READER
X	CEILING MOUNTED SECURITY SYSTEM CAMERA
X	WALL MOUNTED SECURITY SYSTEM CAMERA
DCK	DOOR CONTACT/POSITION SWITCH
A	PRESS PLATE FOR AUTOMATIC DOOR OPERATOR
ADP	ACCESS POINTS WITH ELECTRIFIED DOOR HARDWARE

ABBREVIATIONS

±10'	+10' INDICATES THE MOUNTING HEIGHT OF THE DEVICE TO BOTTOM.
1Ø	1-PHASE
3Ø	3-PHASE
ATS	AUTOMATIC TRANSFER SWITCH
BTM	BOTTOM
CT	CURRENT TRANSFORMER
EOE	EXISTING OVERHEAD ELECTRIC
EOF	EXISTING OVERHEAD FIBER OPTIC
EOP	EXISTING OVERHEAD PRIMARY
EOS	EXISTING OVERHEAD SECONDARY
EOT	EXISTING OVERHEAD TELEPHONE
EUE	EXISTING UNDERGROUND ELECTRIC
EUF	EXISTING UNDERGROUND FIBER OPTIC
EUP	EXISTING UNDERGROUND PRIMARY
EUS	EXISTING UNDERGROUND SECONDARY
EUT	EXISTING UNDERGROUND TELEPHONE
EOTV	EXISTING OVERHEAD TELEVISION
EUTV	EXISTING UNDERGROUND TELEVISION
GF	GROUND FAULT PROTECTION
GND	GROUND
KWH	KILO WATT HOUR
OE	OVERHEAD ELECTRIC
OF	OVERHEAD FIBER OPTIC
OP	OVERHEAD PRIMARY
OS	OVERHEAD SECONDARY
OT	OVERHEAD TELEPHONE
OTV	OVERHEAD TELEVISION
PT	POTENTIAL TRANSFORMER
SPD	SURGE PROTECTIVE DEVICE
UE	UNDERGROUND ELECTRIC
UF	UNDERGROUND FIBER OPTIC
UP	UNDERGROUND PRIMARY
US	UNDERGROUND SECONDARY
UT	UNDERGROUND TELEPHONE
UTP	UNSHIELDED TWISTED PAIR
UTV	UNDERGROUND TELEVISION
WG	PROVIDE DEVICE WITH MANUFACTURER'S WIREGUARD.
WP	PROVIDE DEVICE WITH WEATHERPROOF COVER. RECEPTACLES TO BE WEATHER-RESISTANT TYPE AND PROVIDED WITH A CAST ALUMINUM, EXTRA DUTY, WHILE-IN-USE COVER.

ELECTRICAL DEVICE MOUNTING HEIGHTS

SWITCHES	48 INCHES TO TOP
INTERIOR RECEPTACLES	16 INCHES TO BOTTOM
EXTERIOR RECEPTACLES	24 INCHES TO BOTTOM
COMMUNICATIONS / DATA OUTLETS	16 INCHES TO BOTTOM
FIRE ALARM MANUAL PULL STATIONS	48 INCHES TO TOP
FIRE ALARM HORN/STROBE SIGNAL	80 INCHES TO BOTTOM
FIRE ALARM STROBE SIGNAL	80 INCHES TO BOTTOM
WALL TELEPHONES	48 INCHES TO TOP
TELEVISION OUTLETS	72 INCHES TO BOTTOM
CLOCKS	96 INCHES TO TOP

NOTE: MOUNTING HEIGHTS UNLESS OTHERWISE NOTED ON DRAWINGS.

GENERAL NOTES:

DEMOLITION

A. ALL ELECTRICAL ITEMS SHOWN AS LIGHTER WEIGHT ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.

B. ALL ELECTRICAL ITEMS SHOWN IN HEAVIER WEIGHT SHALL BE REMOVED UNLESS OTHERWISE NOTED.

C. THE CONDUIT, CONDUCTORS, HANGERS, SUPPORTS, CONCRETE BASES, HOUSEKEEPING PADS, AND ANY OTHER ITEMS ASSOCIATED WITH EQUIPMENT SHOWN TO BE REMOVED SHALL ALSO BE REMOVED UNLESS OTHERWISE NOTED. ALL CONDUCTORS SHALL BE REMOVED BACK TO THE SOURCE. ALL ACCESSIBLE CONDUITS SHALL BE REMOVED. EXISTING UNDERGROUND CONDUITS MAY BE ABANDONED IN PLACE AFTER THEIR ENDS HAVE BEEN REMOVED TO A MINIMUM OF 30 INCHES BELOW GRADE AND CAPPED.

D. WHERE ANY EXISTING ELECTRICAL ITEMS ARE SHOWN TO BE REMOVED, THE ELECTRICAL CONTRACTOR SHALL RECONNECT WIRING AS REQUIRED TO ENSURE ALL DOWNSTREAM DEVICES REMAIN OPERATIONAL.

E. REMOVE ALL EXISTING AND ACCESSIBLE ABANDONED LOW VOLTAGE CABLING. ACCESSIBLE AREAS INCLUDE, BUT NOT LIMITED TO, ABOVE LAY-IN CEILINGS, BELOW RAISED FLOORS AND EXPOSED LOCATIONS.

F. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PATCHING AND REPAIRING ALL AREAS WHERE WALLS, SLABS AND MATERIALS HAVE BEEN CUT, REMOVED OR MODIFIED AS A RESULT OF DEMOLITION. PATCHING AND REPAIRS SHALL MATCH THE ADJACENT EXISTING MATERIALS, RATINGS AND FINISHES.

G. REFER TO THE MECHANICAL, PLUMBING, AND FIRE PROTECTION PLANS FOR LOCATION OF EQUIPMENT REQUIRING ELECTRICAL DEMOLITION. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR DISCONNECTING EQUIPMENT AND DEMOLISHING THE ASSOCIATED CONDUIT, CONDUCTORS, DISCONNECTS, STARTERS, ETC.

H. ALL EXISTING ITEMS SHOWN HAVE BEEN COMPILED FROM SITE SURVEYS, RECORD DRAWINGS AND VISUAL SITE INSPECTIONS. ALL ITEMS TO BE REMOVED MAY NOT BE SHOWN ON THIS DRAWING. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID TO BECOME FAMILIAR WITH THE EXTENT OF THE DEMOLITION WORK REQUIRED.

I. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR KEEPING ALL EXISTING SYSTEMS ACTIVE UNTIL THEY ARE DEMOLISHED IN THEIR RESPECTIVE PHASES. PROVIDE ALL TEMPORARY CONNECTIONS AS REQUIRED. COORDINATE ALL DEMOLITION WORK WITH THE TIMING/SEQUENCE OF NEW WORK.

J. WHERE THE CONTRACT DOCUMENTS INCLUDE THE REMOVAL OF THE EXISTING CEILINGS, EXISTING CEILING MOUNTED DEVICES NOT SHOWN TO BE REMOVED SHALL BE PROTECTED, SUPPORTED IN-PLACE AND REINSTALLED IN THE NEW CEILING.

SYSTEMS

A. ALL ELECTRICALLY CONDUCTIVE CABLES INSTALLED OUTDOORS SHALL BE PROVIDED WITH SURGE PROTECTION DEVICE(S). THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING: FIRE ALARM CABLING FOR TAMPER SWITCHES, EXTERIOR MOUNTED SECURITY CAMERA CABLING, EXTERIOR MOUNTED SPEAKER CABLING AND CABLING BETWEEN SEPARATE BUILDINGS.

SURFACE RACEWAY

A. ALL SURFACE RACEWAYS SHALL BE WIREMOLD 700, AND 2400 SERIES OR APPROVED EQUAL UNLESS NOTED OTHERWISE.

B. 700 SERIES SHALL BE USED FOR RECEPTACLES, SWITCHES AND FIRE ALARM DEVICES. 2400 SERIES SHALL BE INSTALLED FOR VOICE AND DATA CABLING.

C. ALL SURFACE RACEWAY IS TO BE MOUNTED ON EXISTING WALLS ONLY. USE SUPPORTING CLIPS AND NOT MOUNTING STRAPS. THE CONTRACTOR HAS THE OPTION TO FISH FLEXIBLE CONDUIT DOWN EXISTING WALLS IN LIEU OF USING SURFACE RACEWAY.

D. COORDINATE THE ROUTING OF ALL RACEWAY WITH WALL MOUNTED FURNISHINGS (I.E. TACKBOARDS, MARKERBOARDS, INTERACTIVE WHITEBOARDS, ETC.).

CABLING

A. ALL EXPOSED LOW VOLTAGE CABLING SHALL BE PLENUM RATED.

NOMINAL VOLTAGE

A. THE NOMINAL VOLTAGE FOR THE POWER DISTRIBUTION SYSTEM SHALL BE 120/240V, 120/208V OR 277/480V AS NOTED ON THE DRAWINGS.

B. THE CONTRACTOR SHALL CONFIRM THE SUPPLY VOLTAGE AT THE SERVICE IS NOMINAL PRIOR TO ENERGIZING PERMANENT POWER. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY AND ADJUST THE TAPS ON THE UTILITY TRANSFORMER AS NECESSARY TO PROVIDE THE SPECIFIED NOMINAL VOLTAGE AT THE SERVICE.

C. THE CONTRACTOR SHALL CONFIRM THE SUPPLY VOLTAGE ON EQUIPMENT CONNECTED TO THE SECONDARY OF DISTRIBUTION TRANSFORMERS IS NOMINAL PRIOR TO ENERGIZING. THE CONTRACTOR SHALL ADJUST THE TAPS ON DISTRIBUTION TRANSFORMERS AS NECESSARY TO PROVIDE THE SPECIFIED NOMINAL VOLTAGE AT THE EQUIPMENT.

D. THE CONTRACTOR SHALL INFORM THE ENGINEER IF THE VOLTAGE AT THE SERVICE OR AT THE EQUIPMENT CONNECTED TO THE SECONDARY OF DISTRIBUTION TRANSFORMERS IS MORE THAN +/- 2% OF NOMINAL.

E. THE CONTRACTOR SHALL PROVIDE A WRITTEN RECORD OF THE MEASURED VOLTAGES TO THE ENGINEER AND INCLUDE A COPY IN THE O&M MANUALS.

INTERRUPTIONS OF SERVICE

A. THE BUILDING SERVICES AND SYSTEMS SHALL REMAIN OPERATIONAL THROUGHOUT THE DURATION OF THE PROJECT. IF INTERRUPTIONS TO ANY SERVICE OR SYSTEM ARE NECESSARY TO FACILITATE COMPLETING THE PROJECT, THE CONTRACTOR SHALL:
1. APPRISE THE OWNER OF ANTICIPATED INTERRUPTIONS IN ADVANCE AND SCHEDULE FOR TIMES THAT ARE CONVENIENT TO THE OWNER AND ALL OTHER AFFECTED PARTIES.
2. COORDINATE AN ACCEPTABLE DURATION AND WORK AS NECESSARY TO MEET THE AGREED UPON SCHEDULE.
3. NO INTERRUPTIONS SHALL OCCUR PRIOR TO RECEIVING WRITTEN APPROVAL FROM THE OWNER AND ALL OTHER AFFECTED PARTIES.

4. FOR UNPLANNED INTERRUPTIONS, THE CONTRACTOR SHALL WORK CONTINUOUSLY TO RESTORE THE AFFECTED SERVICE(S) AND SYSTEM(S).

SHERMAN CARTER BARNHART ARCHITECTS

COMMONWEALTH OF KENTUCKY
DAVID T. WHITE
LICENSED PROFESSIONAL ENGINEER
02/26/2025

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ELECTRICAL LEGEND & GENERAL NOTES

JOB NO.	2407
DATE	02/25/2025
DRAWN	DTW
CHECKED	WCC

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No.	Description	Date

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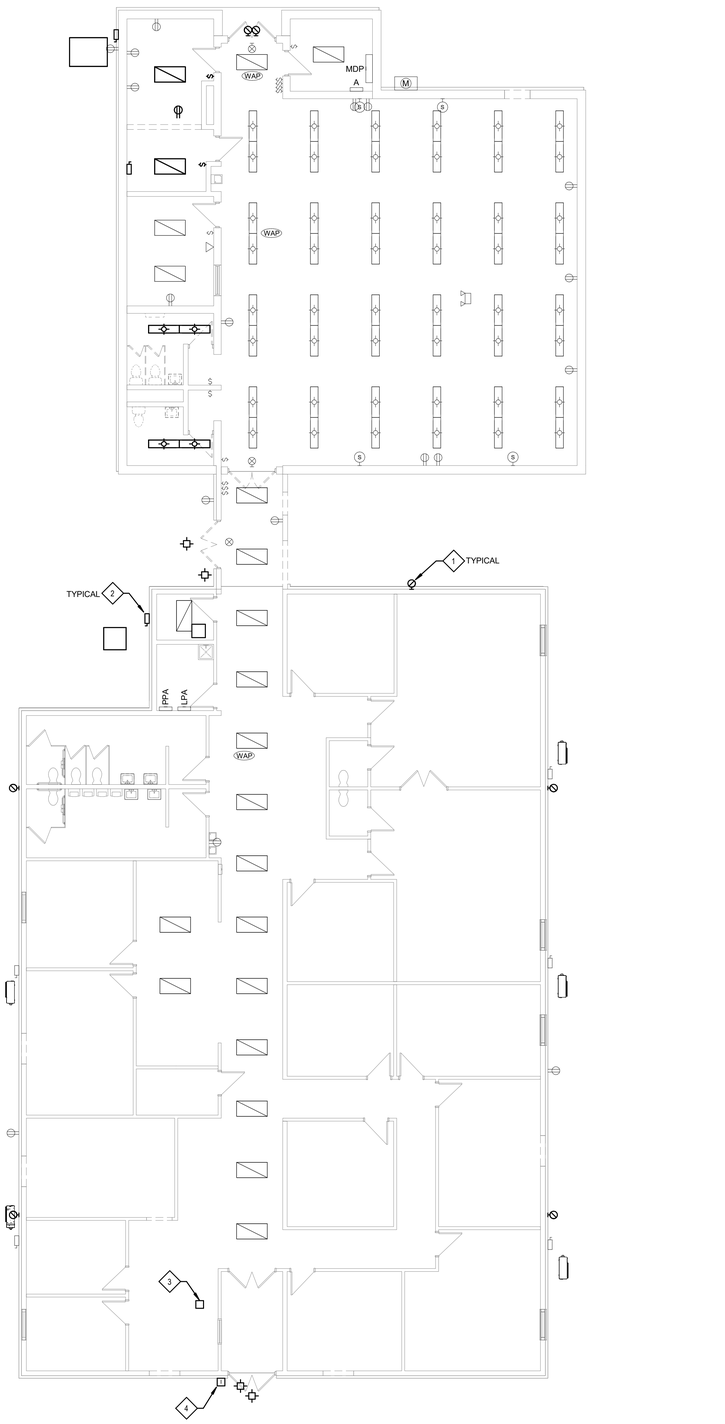
GENERAL NOTES

A. REFER TO DRAWING E0.1 FOR GENERAL ELECTRICAL NOTES.

◇ DEMOLITION KEYNOTES

1. DEMOLISH EXISTING LIGHT FIXTURE, ASSOCAITED CONDUIT AND WIRING BACK TO SOURCE.
2. DEMOLISH EXISTING DISCONNECT SWITCH, ASSOCIATED CONDUIT AND WIRING BACK TO SOURCE.
3. REMOVE EXISTING AIPHONE MASTER CONTROL STATION AND TURN OVER TO THE OWNER.
4. REMOVE EXISTING AIPHONE VIDEO DOOR STATION AND TURN OVER TO THE OWNER. ALL ASSOCIATED CABLING SHALL BE REMOVED.



1 DEMOLITION PLAN - ELECTRICAL

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

SHERMAN CARTER BARNHART ARCHITECTS

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02/26/2025

SHROUT TATE WILSON
MECHANICAL AND ELECTRICAL ENGINEERS
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SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATTION

110 REASOR AVENUE

TAYLORSVILLE, KENTUCKY

DEMOLITION PLANS - ELECTRICAL

JOB NO.	2407
DATE	02/25/2025
DRAWN	DTW
CHECKED	WCC

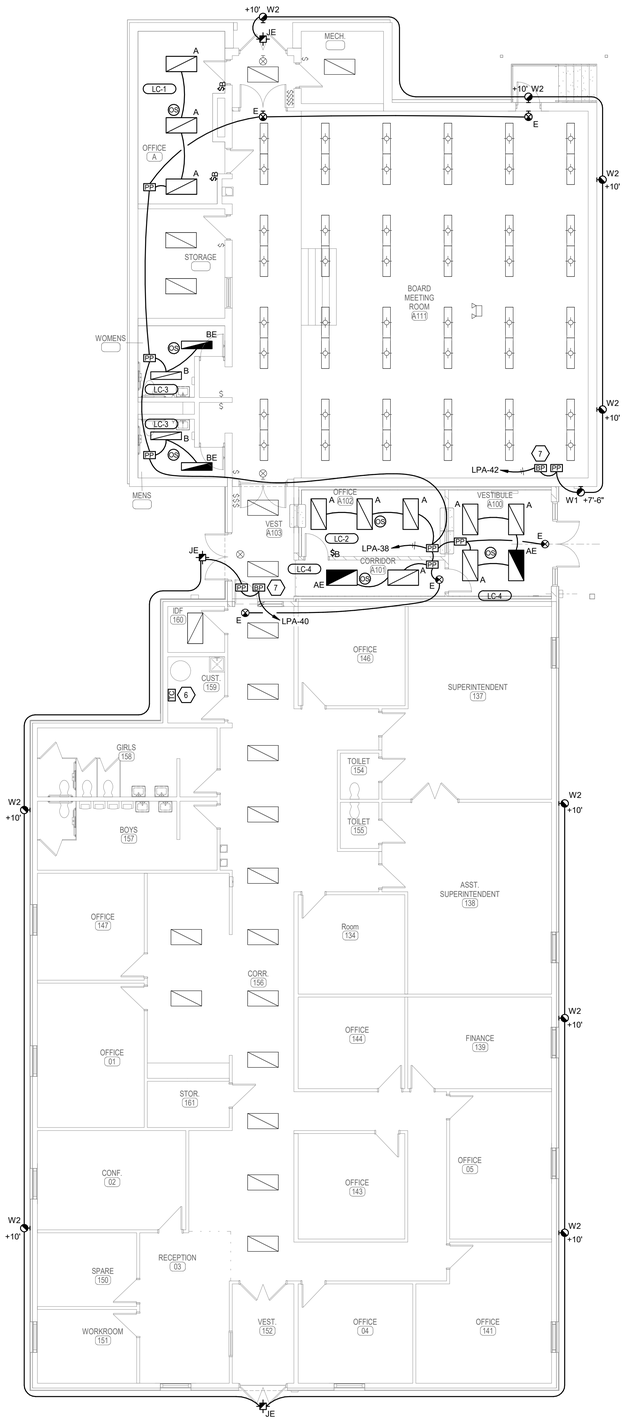
REVISIONS

No.	Description	Date

SHEET

ED1.1

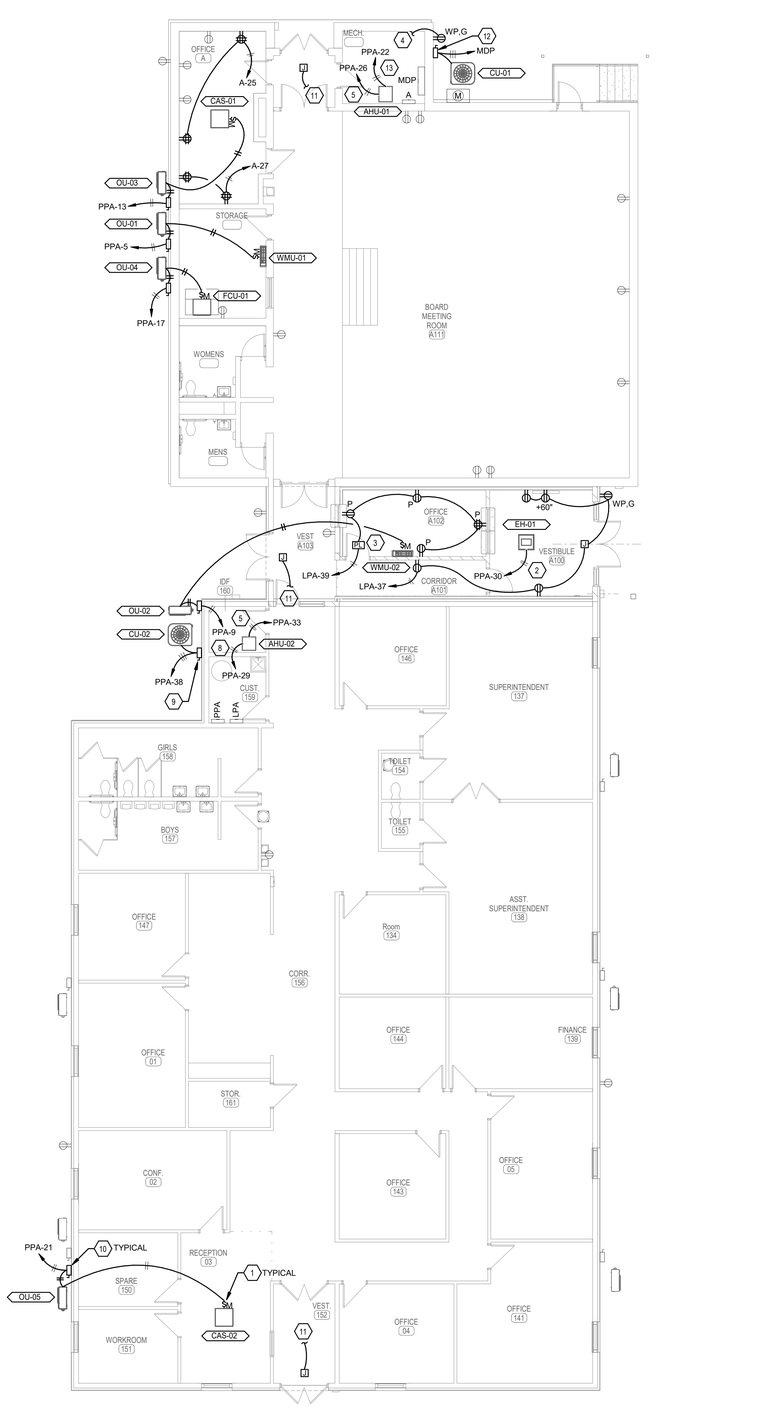
2407
SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATTION
2/27/2025 11:24:02 AM



1 NEW WORK PLAN - LIGHTING

SCALE: 1/8" = 1'-0"

0 4' 8' 16'



2 NEW WORK PLAN - POWER

SCALE: 1/8" = 1'-0"

0 4' 8' 16'

GENERAL NOTES

A. REFER TO DRAWING E0.1 FOR GENERAL ELECTRICAL NOTES.

B. CONTRACTOR SHALL PROVIDE AND INSTALL STAND ALONE LIGHTING CONTROL DEVICES, CABLING, AND ALL NECESSARY COMPONENTS TO ACHEIVE A COMPLETE, OPERATIONAL SYSTEM. REFER TO SHEET E3.2 FOR ADDITIONAL DEVICE AND CONTROL REQUIREMENTS.

C. THE USE OF SURFACE MOUNTED OUTLET BOXES AND SURFACE RACEWAY (WIREMOLD) IS ACCEPTABLE ON EXISTING WALLS ONLY. WIREMOLD 700 SERIES SURFACE RACEWAY SHALL BE USED FOR RECEPTACLE CIRCUITS. WIREMOLD 2400 SERIES SURFACE RACEWAY SHALL BE USED FOR FUTURE DATA OUTLETS/CABLING.

D. ALL DEVICES SHOWN ON NEW WALLS SHALL BE FLUSH MOUNTED, AND ALL RACEWAYS SERVING THESE DEVICES SHALL BE EMT AND CONCEALED IN WALLS OR ABOVE CEILINGS.

SHEET KEYNOTES

1. PROVIDE 20A/2P, 250V MOTOR RATED TOGGLE SWITCH AND CONNECTION TO UNIT. INSTALL SWITCH ADJACENT TO AND WITHIN 3' OF UNIT. COORDINATE WIRING REQUIREMENTS WITH SUPPLIER, UNIT TO BE POWERED FROM ASSOCIATED CONDENSING UNIT AS INDICATED. TYPICAL
2. PROVIDE CONNECTION TO ELECTRIC HEATER, DISCONNECT SWITCH FURNISHED INTEGRAL TO UNIT. 2#10, 1#10G, 3/4"C.
3. PROVIDE RECEPTACLES IN THIS ROOM WITH PLUG LOAD CONTROL, SEE TYPICAL PLUG LOAD CONTROL RISER FOR WIRING REQUIREMENTS.
4. CONNECT TO NEAREST 120V RECEPTACLE CIRCUIT IN THIS ROOM.
5. PROVIDE POWER CONNECTION TO AIR HANDLER UNIT HEAT KIT WITH 2#4, 1#10G, 1"C.
6. PROVIDE nLIGHT NDTC DIGITAL TIME CLOCK FOR CONTROL OF EXTERIOR LIGHT FIXTURES. REFER TO LIGHTING CONTROL DETAILS FOR ADDITIONAL INFORMATION.
7. ROUTE CIRCUIT THROUGH EMERGENCY LIGHTING INVERTER 'BP' AND EXTERIOR LIGHTING CONTROL RELAY AS INDICATED. SEE LIGHTING CONTROL DETAILS FOR REQUIREMENTS.
8. PROVIDE POWER CONNECTION TO AIR HANDLER UNIT WITH 2#10, 1#10G, 3/4"C.
9. PROVIDE 30A/3P, 250V, NEMA 3R NON-FUSED DISCONNECT SWITCH AND CONNECTION TO HVAC UNIT. 3#10, 1#10G, 3/4"C.
10. PROVIDE 20A/2P, 250V, NEMA 3R NON-FUSED DISCONNET SWITCH AND CONNECTION TO HVAC UNIT. TYPICAL
11. PROVIDE POWER CONNECTION TO DOOR HARDWARE POWER SUPPLY. CONNECT TO NEAREST RECEPTACLE CIRCUIT IN THIS AREA.
12. PROVIDE 60A/3P, 250V, NEMA 3R NON-FUSED DISCONNECT SWITCH AND CONNECTION TO HVAC UNIT. PROVIDE NEW 35A/3P CIRCUIT BREAKER IN MDP TO SERVE THIS UNIT WITH 3#6, 1#10G, 3/4"C.
13. PROVIDE POWER CONNECTION TO AIR HANDLER UNIT WITH 2#6, 1#10G, 3/4"C.

SHERMAN CARTER BARNHART ARCHITECTS

COMMONWEALTH OF KENTUCKY
WILLIAM C. WILSON
25711
LICENSED PROFESSIONAL ENGINEER
02/26/2025

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GENERAL NOTES

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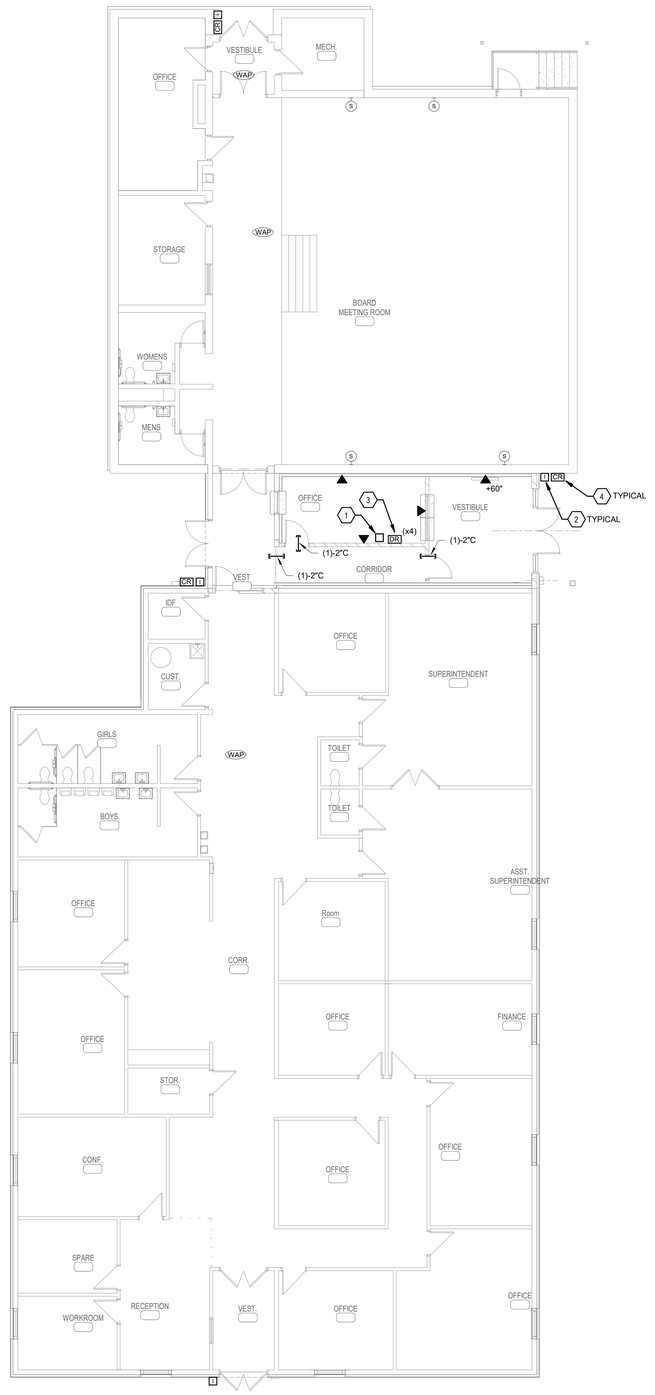
C. ALL DEVICES SHOWN ON NEW WALLS SHALL BE FLUSH MOUNTED, AND ALL RACEWAYS SERVING THESE DEVICES SHALL BE EMT AND CONCEALED IN WALLS OR ABOVE CEILINGS.

SHEET KEYNOTES

1. PROVIDE AND INSTALL NEW AIPHONE SYSTEM MASTER CONTROL STATION. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO INSTALLATION. PROVIDE ALL NECESSARY CABLING AND COMPONENTS BETWEEN THE MASTER STATION AND VIDEO DOOR STATION(S) TO ACHEIVE A COMPLETE OPERATIONAL SYSTEM. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. PROVIDE AND INSTALL NEW AIPHONE VIDEO DOOR STATION AND REQUIRED CABLING. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. VIDEO DOOR STATION SHALL BE INSTALLED IN A WEATHERPROOF BOX FLUSH MOUNTED IN NEW METAL WALL PANEL SYSTEM.
3. PROVIDE (4) DOOR RELEASE PUSH BUTTON STATIONS FOR CONTROL OF SECURE ENTRY DOORS AS PART OF THE AIPHONE SYSTEM. MOUNT DOOR RELEASE PUSH BUTTONS TO UNDERSIDE OF DESK IN THIS ROOM AS DIRECTED BY OWNER.
4. PROVIDE ROUGH-IN FOR FUTURE CARD READER WITH 1" CONDUIT STUBBED ABOVE NEAREST ACCESSIBLE CEILING. BOX SHALL BE FLUSH MOUNTED IN NEW METAL WALL PANEL SYSTEM.



2 NEW WORK PLAN - SYSTEMS

SCALE: 1/8" = 1'-0"

0 4" 8" 16"

SHERMAN CARTER BARNHART ARCHITECTS

STATE OF KENTUCKY DAVID T. WILKEY 25717 LICENSED PROFESSIONAL ENGINEER

02/26/2025

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NEW WORK PLANS - ELECTRICAL

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E2.1

2407
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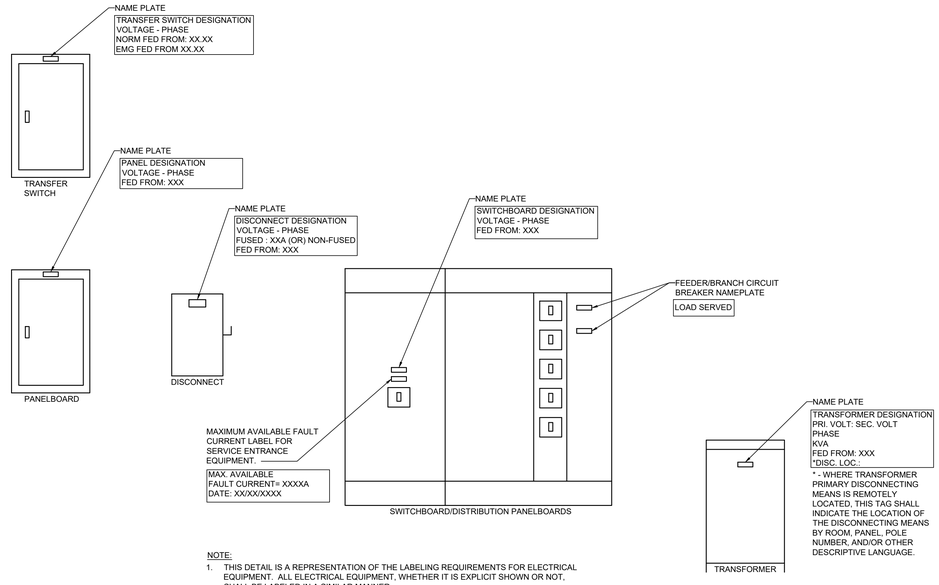
2/27/2025 11:24:03 AM

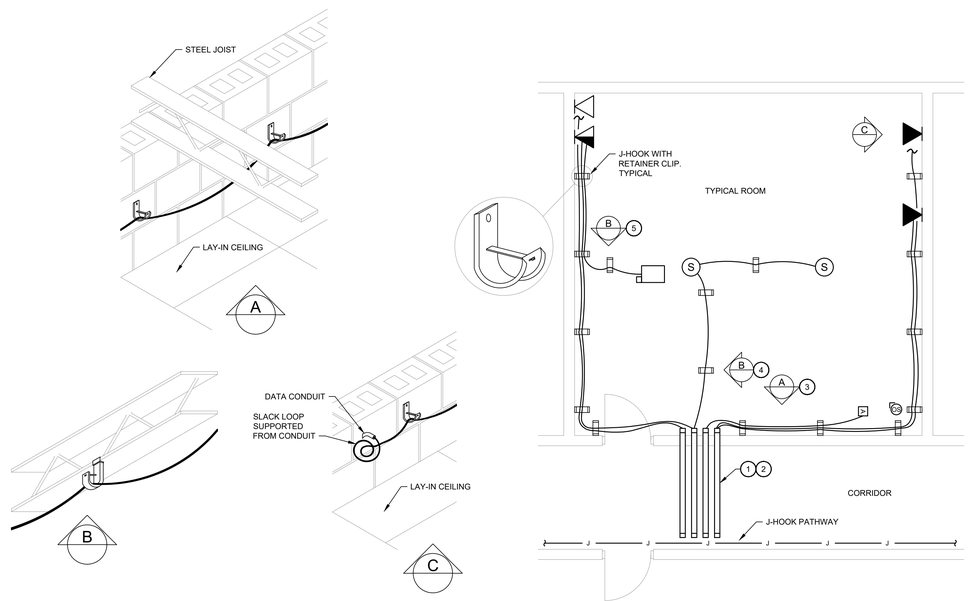


NOTE:

1. THIS DETAIL IS A REPRESENTATION OF THE LABELING REQUIREMENTS FOR ELECTRICAL EQUIPMENT. ALL ELECTRICAL EQUIPMENT, WHETHER IT IS EXPLICIT SHOWN OR NOT, SHALL BE LABELED IN A SIMILAR MANNER.
2. ALL LABELS SHALL BE ENGRAVED LAMINATED ACRYLIC. THE EQUIPMENT DESIGNATION SHALL HAVE A MINIMUM TEXT HEIGHT OF 3/8". THE REMAINING TEXT SHALL HAVE A MINIMUM HEIGHT OF 1/8".
3. LABELS FOR EQUIPMENT CONNECTED TO THE NORMAL POWER SYSTEM SHALL BE BLACK WITH WHITE TEXT. LABELS FOR EQUIPMENT CONNECTED TO THE EMERGENCY POWER SYSTEM SHALL BE RED WITH WHITE TEXT.
4. NAMEPLATES FOR EQUIPMENT LOCATED IN THE INTERIOR OF THE BUILDING SHALL BE ATTACHED WITH 3M SELF-ADHESIVES. EQUIPMENT INSTALLED AT EXTERIOR OF THE BUILDING SHALL BE ATTACHED WITH SCREWS AND THE LABEL SHALL HAVE PRE-PUNCHED OR PREDRILLED HOLES.

ELECTRICAL EQUIPMENT IDENTIFICATION

NOT TO SCALE



DETAIL NOTES

1. EXTEND CONDUIT SLEEVES FROM J-HOOK PATHWAY TO ROOM. PROVIDE A MINIMUM OF 1-INCH CONDUITS WITH A MINIMUM QUANTITY OF ONE PER VOICE/DATA OUTLET LOCATED IN THE ROOM. INSTALL AN ADDITIONAL ONE INCH CONDUIT FOR OTHER LOW VOLTAGE CABLING TO BE INSTALLED TO THE ROOM. FEWER LARGER CONDUITS SLEEVES MAY BE INSTALLED, BUT 40% FILL RATIO MUST BE MAINTAINED.
2. INSTALL ALL LOW VOLTAGE CABLES IN CONDUIT FROM THE J-HOOK PATHWAY TO THE ROOM. THIS INCLUDES VOICE/DATA, INTERCOM, LIGHTING CONTROLS, TELEVISION, ETC.
3. INSTALL J-HOOKS AROUND PERIMETER OF WALL TO OUTLETS AS SHOWN. MOUNT J-HOOKS BELOW THE STRUCTURAL JOISTS AND ABOVE THE CEILING. J-HOOKS SHALL BE INSTALLED NO MORE THAN 5 FEET ON CENTER (TYPICAL).
4. WHEN LOW VOLTAGE DEVICES ARE LOCATED AWAY FROM THE PERIMETER WALL, J-HOOKS SHALL BE MOUNTED TO THE BOTTOM OF THE STRUCTURAL JOISTS AND EXTEND TO THE DEVICE LOCATIONS AS SHOWN.
5. SUPPORT A/V CABLING FROM THE MULTI-MEDIA OUTLET TO THE A/V COMPONENTS IN J-HOOKS.

TYPICAL LOW VOLTAGE CABLE DISTRIBUTION

NOT TO SCALE

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ELECTRICAL DETAILS

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E3.1

2135
HARLAN INDEPENDENT SCHOOLS RENOVATION - PHASE III: ATHLETICS
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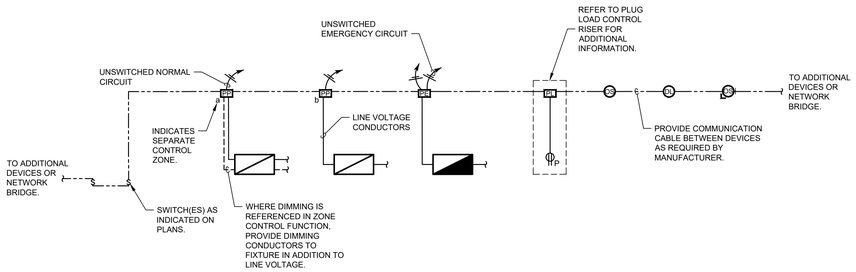


NOTE: LIGHTING CONTROL RISER SHOWS TYPICAL CONNECTIONS BETWEEN DEVICES AND LIGHT FIXTURES. REFER TO THE FLOOR PLANS FOR QUANTITIES OF DEVICES, LIGHT FIXTURES, AND ZONES.

TYPICAL LIGHTING CONTROL RISER

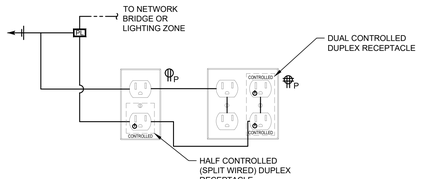
NOT TO SCALE

LIGHTING CONTROL SEQUENCE OF OPERATION

LC-T	SPACE TYPE/FUNCTION	OCCUPANCY SENSOR				TIME CLOCK				WALL SWITCH							DAYLIGHT				OTHER				ZONE CONTROL	NOTES
		VACANCY MODE	OCCUPANCY MODE	SENSOR TIMEOUT PERIOD (MINUTES)	DUAL TECHNOLOGY	OCCUPIED HOURS	SCHEDULED ON AT	SCHEDULED OFF AT	SCHEDULE OVERRIDE SWITCH	MANUAL (ON/OFF) - LV	MANUAL DIMMING (0-10V)	KEY SWITCH - LV MOMENTARY	PRESET SCENE CONTROL	ZONE CONTROL	GRAPHICAL TOUCHSCREEN	LINE VOLTAGE	SWITCHING (ON/OFF)	DIMMING	TARGET LIGHT LEVEL	EXTERIOR LOCATION	EM NIGHT LIGHT DIMMING	RGBW CONTROL	EXHAUST FAN	PLUG LOAD CONTROLS		
LC-1	SINGLE ZONE W/ DIMMING	X	-	30 MIN	X	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	-	
LC-2	OFFICE WITH PLUG LOAD CONTROL	X	-	30 MIN	X	-	-	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-	-	X	REFER TO PLUG LOAD CONTROL DETAIL LC-P FOR ADDITIONAL INFORMATION
LC-3	SINGLE RESTROOM & FAN CONTROL	-	X	30 MIN	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	AUTO ON/OFF BY OCCUPANCY SENSOR INTERLOCK EXHAUST FAN IN ROOM WITH LIGHTING CONTROL RELAY
LC-4	CORRIDOR/VESTIBULE	-	X	30 MIN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	AUTO ON/OFF BY OCCUPANCY SENSOR
LC-EXT	EXTERIOR	-	-	-	-	-	DUSK	DAWN	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	EXTERIOR LIGHTING TO BE CONTROLLED BY nLIGHT nDTC DIGITAL TIME CLOCK. (TIME OF DAY CONTROLLED) MANUAL OR SCHEDULED EVENT OVERRIDE

GENERAL NOTES

- A BASIS OF DESIGN: nLIGHT, WATTSTOPPER AND HUBBELL EQUIVALENTS
- B PROVIDE A COMPLETE STAND-ALONE LIGHTING CONTROL SYSTEM
- C PROVIDE ALL MATERIAL AND LABOR NECESSARY TO PERFORM ZONE CONTROL FUNCTIONS DESCRIBED ABOVE
- D PROVIDE DETAILED LIGHTING CONTROL FLOOR PLANS AT PLAN SCALE, RISERS, ETC WITH SHOP DRAWING SUBMITTALS
- E LIGHTING CONTROL RISER SHOW TYPICAL TYPICAL CONNECTIONS BETWEEN DEVICES AND LIGHT FIXTURES, COORDINATE QUANTITY OF DEVICES, FIXTURES, ZONES, ETC WITH CONTRACT FLOOR PLANS



ZONE CONTROL (NETWORKED SYSTEM)
1. OCCUPIED TIME - 6AM-6PM
2. UNOCCUPIED TIME - 6PM-6AM
3. OCCUPIED TIME
   A. AUTO-ON, REMAIN ON.
4. UNOCCUPIED TIME
   A. AUTO-ON WHEN OCCUPANCY DETECTED
   B. AUTO-OFF AFTER ON OCCUPANCY DETECTED FOR 15 MINUTES.

ZONE CONTROL (STAND ALONE SYSTEM)
1. AUTO-ON WHEN OCCUPANCY DETECTED
2. AUTO-OFF AFTER ON OCCUPANCY DETECTED FOR 15 MINUTES.

TYPICAL PLUG LOAD CONTROL RISER

NOT TO SCALE

NOTES:
1. CONTROLLED RECEPTACLES SHALL BE PERMANENTLY MARKED FROM THE FACTORY.

LIGHTING CONTROL LEGEND

SYMBOL	DESCRIPTION
^{A}	ON/OFF
^{B}	ON/OFF, RAISE/LOWER
^{C}	2-ZONE, ON/OFF
^{E}	2-ZONE, ON/OFF, RAISE/LOWER
^{F}	OCCUPANCY SENSOR, ON/OFF
^{G}	OCCUPANCY SENSOR, ON/OFF, RAISE/LOWER
^{H}	4-ZONE, ON/OFF, RAISE/LOWER
^{L}	LOW VOLTAGE SWITCH
PP a	POWER PACK WITH 0-10V DIMMING - 'a' SUBSCRIPT INDICATES ZONE
EP a	EMERGENCY POWER PACK WITH 0-10V DIMMING - 'a' SUBSCRIPT INDICATES ZONE
PL a	PLUG LOAD CONTROL POWER PACK - 'a' SUBSCRIPT INDICATES ZONE
SC	SYSTEM CONTROLLER
UC	USER CONTROLLER
NB	NETWORK BRIDGE
a	LIGHT FIXTURE DRIVER. REFER TO LIGHT FIXTURE SCHEDULE - 'a' SUBSCRIPT INDICATES ZONE CONTROL.
SI	RJ45 SPLITTER
PS	POWER SUPPLY
OS	360 DEGREE DUAL TECHNOLOGY OCCUPANCY SENSOR
WOS	CORNER MOUNTED, DUAL TECHNOLOGY OCCUPANCY SENSOR
DL	DAYLIGHT SENSOR
----------	2#18 DIMMING CONDUCTOR CABLE
—·—·—	CATEGORY 5E UTP NETWORK CABLE

LIGHT FIXTURE SCHEDULE

FIXTURE TYPE	DESCRIPTION	LAMPS						VOLTS	MOUNTING TYPE	MANUFACTURER - MODEL NUMBER	NOTES
		TYPE	CRI	DIMMING	COLOR TEMP	LUMENS	WATTS				
A	2'x4' ARCHITECTURAL TROFFER, LINEAR PRISMATIC CENTER BASKET, L80 OF 60,000 HOURS, CSA LISTING FOR DAMP LOCATIONS, 5 YEAR WARRANTY	LED	>80	0-10V, @ 1%	4000K	4000	32	120	RECESSED	LITHONIA 2BLT4 40L ADSM GZ1 LP840 METALUX EQUAL WILLIAMS EQUAL	
AE	SAME AS TYPE 'A' WITH BACKUP BATTERY/DRIVER	LED	>80	0-10V, @ 1%	4000K	4000	32	120	RECESSED	LITHONIA 2BLT4 40L ADSM GZ1 LP840 E10WLCP METALUX EQUAL WILLIAMS EQUAL	
B	1'x4' ARCHITECTURAL TROFFER, LINEAR PRISMATIC CENTER BASKET, L80 OF 60,000 HOURS, CSA LISTING FOR DAMP LOCATIONS, 5 YEAR LIMITED WARRANTY	LED	>80	0-10V, @ 1%	4000K	4000	32	120	RECESSED	LITHONIA BLT4 40L ADSM GZ1 LP840 METALUX EQUAL WILLIAMS EQUAL	
BE	SAME AS TYPE 'B' WITH BACKUP BATTERY/DRIVER	LED	>80	0-10V, @ 1%	4000K	4000	32	120	RECESSED	LITHONIA BLT4 40L ADSM GZ1 LP840 EL7L METALUX EQUAL WILLIAMS EQUAL	
BP	EMERGENCY LIGHTING INVERTER	-	-	-	-	-	250	120	SURFACE/WALL	ISOLITE ESMINI-250-LC-MB CHLORIDE EQUAL DUALITE EQUAL	
E	DIE-CAST ALUMINUM LED EXIT SIGN	LED	-	-	-	-	<5	120	VARIES	LITHONIA LE S SERIES DUALITE EQUAL ISOLITE EQUAL	1
JE	10" X 10" SURFACE MOUNT SQUARE LED FIXTURE WITH CAST-ALUMINUM HOUSING, ADJUSTABLE LUMEN OUTPUT AND COLOR TEMPERATURE, UL LISTED FOR WET LOCATIONS, 5 YEAR LIMITED WARRANTY	LED	>80	0-10V, @ 1%	4000K	5000	34	120	SURFACE	LITHONIA CNY LED ALO SWW2 UVOLT PE PIR M2 METALUX EQUAL WILLIAMS EQUAL	
W1	9" TALL x 13" WIDE LED WALL PACK, DIE-CAST ALUMINUM HOUSING, GLASS REFRACTOR, L80 OF 100,000 HOURS, IP65 RATED FOR OUTDOOR APPLICATIONS, 5 YEAR WARRANTY	LED	>80	0-10V, @ 1%	4000K	3250	23	120	WALL	LITHONIA TWX2 LED P1 40K MVOLT GE EQUAL HUBBELL EQUAL	
W2	9" TALL x 13" WIDE LED WALL PACK, DIE-CAST ALUMINUM HOUSING, GLASS REFRACTOR, L80 OF 100,000 HOURS, IP65 RATED FOR OUTDOOR APPLICATIONS, 5 YEAR WARRANTY	LED	>80	0-10V, @ 1%	4000K	4400	32	120	WALL	LITHONIA TWX2 LED P2 40K MVOLT GE EQUAL HUBBELL EQUAL	

NOTES:
1 SINGLE OR DOUBLE FACE, DIRECTIONAL ARROWS AND MOUNTING CONFIGURATION AS INDICATED ON DRAWINGS; MOUNT CENTERED OVER DOOR (WHERE APPLICABLE)
2 ARCHITECT TO SELECT COLOR/FINISH
3

EXISTING PANEL 'PPA'

BRANCH CIRCUIT PANELBOARD

VOLTAGE 120/208 | 3 PHASE 4 WIRE | POLES 42 | MAIN AMPS 300 | MAIN TYPE MCB | MIN. KAIC 22 | MOUNTING SURFACE

POLE NO.	BREAKER TRIP	P	LOAD SERVED	PHASE LOADS KVA	A	B	C	KVA	LOAD SERVED	BREAKER TRIP	P	POLE NO.
1	30	2	COND. UNIT	0.0	0.0			0.0	COND. #5	30	2	2
3	-	-		0.0		0.0		0.0	-	-	-	4
5	**15**	**2**	**OU-01**	1.0			1.0	0.0	COND. #4	30	2	6
7	-	-	**(WMU-01)**	1.0	1.0			0.0	-	-	-	8
9	**15**	**2**	**OU-02**	1.0		1.0		0.0	COND. #1	30	2	10
11	-	-	**(WHU-02)**	1.0			1.0	0.0	-	-	-	12
13	**15**	**2**	**OU-03**	1.0	1.0			0.0	COND. #3	30	2	14
15	-	-	**(CAS-01)**	1.0		1.0		0.0	-	-	-	16
17	**15**	**2**	**OU-04**	1.0			1.0	0.0	COND. #2	30	2	18
19	-	-	**(FCU-01)**	1.0	1.0			0.0	-	-	-	20
21	**15**	**2**	**OU-05**	1.0		4.6		3.6	**AHU-01 UNT**	**45**	**2**	22
23	-	-	**(CAS-02)**	1.0			4.6	3.6	-	-	-	24
25	**30**	**2**	**SPARE**	0.0	5.4			5.4	**AHU-01 HEAT KIT**	**60**	**2**	26
27	-	-	-	0.0		5.4		5.4	-	-	-	28
29	**25**	**2**	**AHU-02 UNIT**	1.8			3.3	1.5	**EH-01**	**25**	**2**	30
31	-	-	**-**	1.8	3.3			1.5	**-**	-	-	32
33	60	2	**AHU-02 HEAT KIT**	5.3		5.3		0.0	SPACE			34
35	-	-	-	5.3			5.3	0.0		15	1	36
37	30	2	WATER HEATER	0.0	2.2			2.2	**CU-02**	**35**	**3**	38
39	-	-		0.0		2.2		2.2	-	-	-	40
41			SPACE	0.0			2.2	2.2	-	-	-	42
			PHASE TOTALS:		13.8	19.3	18.2		TOTAL: 51.3 KVA			

BREAKER ABBREVIATIONS: G - GFCI; A - AFCI; L - LOCKOUT; S - SHUNT TRIP; C - COMBINATION GFCI/AFCI; E - ELECTRONIC ADJUSTABLE TRIP; MCB - MAIN CIRCUIT BREAKER; MLO - MAIN LUG ONLY

NOTES:
1. BOLD TEXT INDICATES NEW BREAKER AND/OR LOAD SERVED
2.

EXISTING PANEL 'LPA'

BRANCH CIRCUIT PANELBOARD

VOLTAGE 120/208 | 3 PHASE 4 WIRE | POLES 54 | MAIN AMPS 100 | MAIN TYPE MCB | MIN. KAIC 22 | MOUNTING SURFACE

POLE NO.	BREAKER TRIP	P	LOAD SERVED	PHASE LOADS KVA	A	B	C	KVA	LOAD SERVED	BREAKER TRIP	P	POLE NO.
1	15	1	LIGHTS: CORRIDOR	0.0	0.0			0.0	REC: 20-25	20	1	2
3	20	1	LIGHTS: RESTROOM	0.0		0.0		0.0	REC: 21,23,27	20	1	4
5	20	1	LIGHTS: RM 28/29	0.0			0.0	0.0	REC: COPIER	20	1	6
7	20	1	LIGHTS: RM 26/27	0.0	0.0			0.0	REC: RM 34	20	1	8
9	20	1	LIGHTS: RM 23-25	0.0		0.0		0.0	EXHAUST FAN	20	1	10
11	20	1	LIGHTS: RM 20-22	0.0			0.0	0.0	REC: RM 26/27	20	1	12
13	20	1	LIGHTS: CONF. RM 34	0.0	0.0			0.0	REC: HALL	20	1	14
15	20	1	LIGHTS: RM 30-33	0.0		0.0		0.0	REC: RM 28/29/VEST	20	1	16
17	20	1	REC: RM 24	0.0			0.0	0.0	EW COOLER	20	1	18
19	20	1	REC: RM 22	0.0	0.0			0.0	SPARE	20	1	20
21	20	1	REC: CUST.	0.0		0.0		0.0	REC: RM 20	20	1	22
23	20	1	REC: RM 21-23	0.0			0.0	0.0	REC: RM 32 CONF	20	1	24
25	20	1	REC: CUST.	0.0	0.0			0.0	REC: RM 34 CONF	20	1	26
27	20	1	REC: SERVER	0.0		0.0		0.0	REC: RM 27/29	20	1	28
29	20	1	REC: RM 30	0.0			0.0	0.0	REC: RM 25/29	20	1	30
31	20	1	REC: ENTRY	0.0	0.0			0.0	REC: RM 33	20	1	32
33	20	1	REC: RM 31	0.0		0.0		0.0	SPARE	20	1	34
35	20	1	REC: RM 30/31	0.0			0.0	0.0	REC: SERVER	20	1	36
37	**20**	**1**	**REC: A100/A101**	0.9	1.4			0.5	**LTS: NEW VESTIBULE**	**20**	**1**	38
39	**20**	**1**	**REC: A102 OFFICE**	0.9		1.1		0.2	**LTS: EXTERIOR**	**20**	**1**	40
41			**SPACE**	0.0			0.2	0.2	**LTS: EXTERIOR**	**20**	**1**	42
			PHASE TOTALS:		1.4	1.1	0.2		TOTAL: 2.8 KVA			

BREAKER ABBREVIATIONS: G - GFCI; A - AFCI; L - LOCKOUT; S - SHUNT TRIP; C - COMBINATION GFCI/AFCI; E - ELECTRONIC ADJUSTABLE TRIP; MCB - MAIN CIRCUIT BREAKER; MLO - MAIN LUG ONLY

NOTES:
1. BOLD TEXT INDICATES NEW BREAKER AND/OR LOAD SERVED
2.

EXISTING PANEL 'A'

BRANCH CIRCUIT PANELBOARD

VOLTAGE 120/240 | 1 PHASE 3 WIRE | POLES 30 | MAIN AMPS 100 | MAIN TYPE MCB | MIN. KAIC 22 | MOUNTING SURFACE

POLE NO.	BREAKER TRIP	P	LOAD SERVED	PHASE LOADS KVA	A	B	KVA	LOAD SERVED	BREAKER TRIP	P	POLE NO.
1	20	1	EXISTING LOAD	0.0	0.0		0.0	EXISTING LOAD	20	1	2
3	20	1	EXISTING LOAD	0.0		0.0	0.0	EXISTING LOAD	20	1	4
5	20	1	EXISTING LOAD	0.0	0.0		0.0	EXISTING LOAD	20	1	6
7	20	1	EXISTING LOAD	0.0		0.0	0.0	EXISTING LOAD	20	1	8
9	20	1	EXISTING LOAD	0.0	0.0		0.0	EXISTING LOAD	20	1	10
11	20	1	EXISTING LOAD	0.0		0.0	0.0	EXISTING LOAD	20	1	12
13	20	1	EXISTING LOAD	0.0	0.0		0.0	EXISTING LOAD	20	1	14
15	20	1	EXISTING LOAD	0.0		0.0	0.0	EXISTING LOAD	20	1	16
17	20	1	EXISTING LOAD	0.0	0.0		0.0	EXISTING LOAD	20	1	18
19	20	1	EXISTING LOAD	0.0		0.0	0.0	EXISTING LOAD	20	1	20
21	20	1	EXISTING LOAD	0.0	0.0		0.0	EXISTING LOAD	20	1	22
23	20	1	EXISTING LOAD	0.0		0.0	0.0	EXISTING LOAD	20	1	24
25	**20**	**1**	**REC: ROOM A108**	0.7	0.7		0.0	SPACE			26
27	**20**	**1**	**REC: ROOM A108**	0.7		0.7	0.0	MCB	100	2	28
29			SPACE	0.0	0.0		0.0	-	-	-	30
			PHASE TOTALS:		0.7	0.7		TOTAL: 1.4 KVA			

BREAKER ABBREVIATIONS: G - GFCI; A - AFCI; L - LOCKOUT; S - SHUNT TRIP; C - COMBINATION GFCI/AFCI; E - ELECTRONIC ADJUSTABLE TRIP; MCB - MAIN CIRCUIT BREAKER; MLO - MAIN LUG ONLY

NOTES:
1. BOLD TEXT INDICATES NEW BREAKER AND/OR LOAD SERVED.
2.

SHERMAN CARTER BARNHART ARCHITECTS

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LICENSED PROFESSIONAL ENGINEER
02/26/2025

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SPENCER COUNTY BOARD OF EDUCATION OFFICE ADDITION AND RENOVATION
110 REASOR AVENUE
TAYLORSVILLE, KENTUCKY

ELECTRICAL DETAILS & SCHEDULES

JOB NO.	2407
DATE	02/25/2025
DRAWN	DTW
CHECKED	WCC

REVISIONS

No.	Description	Date

SHEET
E3.2

2135
HARLAN INDEPENDENT SCHOOLS RENOVATION - PHASE III: ATHLETICS
4/12/2023 4:14:59 PM