

PROJECT MANUAL FOR:

ADDITION AND RENOVATION TO: NORRIS MIDDLE SCHOOL 5 NORRIS SQUARE NORRIS, TN 37828

ANDERSON COUNTY SCHOOLS
CONTACT: CLAY MCKAMEY
101 SOUTH MAIN STREET
CLINTON, TN 37716

COMM. NO. 210042.04
ANDERSON COUNTY BID #2234
FEBRUARY 4, 2022 – CONSTRUCTION DOCUMENTS

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Includes:
Addendum #1 - 02/22/2022
Addendum #2 - 03/09/2022
Addendum #3 - 03/30/2022

MBI Companies Inc.

299 N WEISGARBER RD, KNOXVILLE, TN 37919
865-584-0999 / Fax 865-584-5213
www.mbicompanies.com

SET NO. _____

KNOXVILLE, TENNESSEE

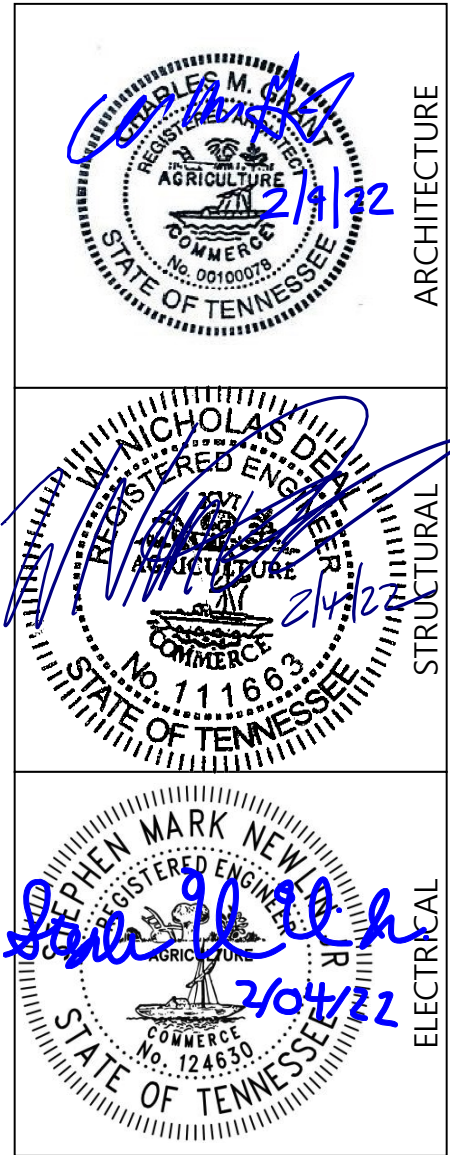


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Sealed bids for the construction of “Addition and Renovation to: Norris Middle School”, 5 Norris Square, Norris, TN 37828” will be received at the office of:

Purchasing Department
Anderson County Courthouse
100 North Main Street, Room 214
Clinton, TN 37716

until April 12, 2022 @ 2:00 p.m., at which time and place they will be publicly opened and read.

Drawings and Specifications and other Contract Documents may be examined at the following locations:

The office of the Architect – MBI Companies, Inc.; 299 N. Weisgarber Road, Knoxville, TN 37919
Knoxville Builders Exchange of Tennessee, Tel: 866-941-BXTN (2986)
Dodge Data & Analytics, Tel: 877-784-9556
Bid Clerk by Construct Connect, Tel: 877-737-6482

The official repository for the bid documents, including any addenda, is Vendor Registry. Bid deposit is not required. Subcontractors, vendors, and others who desire individual drawings and specification sections may obtain them from Knoxville Blueprint, Knoxville, Tennessee, 546-7601, by paying the costs of reproduction, which is not refundable.

Each bid must be accompanied by a Bid Security in the form of a Cashiers Check or a Bidders Bond, executed by the bidder and a surety company in the sum of not less than five percent (5%) of the total amount of the bid including all additive alternates, as a guarantee that, if the bid is accepted, the required contract will be executed and the required performance and payment bonds furnished. Bid Bond shall be executed on AIA Document A310. Said bond will be returned to the unsuccessful bidders as soon as the contract has been awarded and the successful bidder has executed the contract and furnished the necessary bonds and the contract has been executed by the Owner. Such bond shall be from a surety Company authorized to transact business in the State of Tennessee and Company shall be registered in Federal Register, Department of the Treasury, Fiscal Service, Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies; Notice. Attorneys in Fact who sign any bonds must file with each instrument a certified and effective dated copy of their power of attorney.

The successful bidder will be required to execute a performance bond in an amount equal to one hundred percent (100%) of the Contract Sum and a payment bond covering and including labor and materials in an amount equal to one hundred percent (100%) of the Contract Sum. Performance and Labor and Material Payment Bond shall be on AIA Form A312.

All bidders must be licensed contractors as required by the contractors Licensing Act of 1976, enacted by the General Assembly of the State of Tennessee on March 18, 1976 and as amended to date as codified by Tennessee Code Annotated (TCA) Sections §62-6-119. Bidder's name, license number, date of expiration of license, license limit, and that part of license classification applying to the bid must be placed on the envelope containing the bid, otherwise the bid cannot be opened or considered. As applicable by Tennessee Annotated Code and/or TDEC regulations, the names of the Mechanical, Plumbing, Electrical, Masonry, Roofing and/or Geothermal Subcontractors, License numbers, date of expiration of their licenses, license limit, and license classification must also be on the bid envelopes otherwise the bid cannot be opened or considered. General Contractors performing Mechanical, Plumbing, Electrical, Masonry, Roofing and/or Geothermal work must designate this information on the outside of the envelope.

Each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not a person included within or on the list created pursuant to TCA §12-12-106.

No bidder will be permitted to withdraw his bid within sixty (60) days after the date of opening of bids. The Owner reserves the right to reject any or all bids and to waive any informalities therein.

A Prebid Conference will be held April 5, 2022 @ 10:00 a.m. local time at Norris Middle School, 5 Norris Square, Norris, TN 37828. Attendance at this Prebid Conference is mandatory for Prime Bidders; and optional for HVAC, Plumbing, and Electrical Sub-bidders. Representatives of the Owner, the Architect, and Architect's Engineering Consultants will be present to describe and explain the scope of the work to be bid and to answer questions. Representative of all Subcontractors bidding are invited and urged to attend.

Upon award of the construction contract to the successful bidder, construction shall commence on a date to be specified in the "Notice to Proceed" to the Contractor and shall be completed on or before the completion date specified in the Contract Documents as time is of the essence in the performance of the contract for construction.

Upon receipt of Notice to Proceed, the Contractor will complete the work regularly, diligently, and uninterruptedly at such rate of progress as will ensure full completion thereof within the time specified on the Bid Form.

The Owner reserves the right to waive any information in or to reject any or all bids and to accept the bid deemed favorable to the interest of the Owner.

END OF SECTION



AIA[®] Document A701[™] – 2018

Instructions to Bidders

for the following Project:

(Name, location, and detailed description)

Addition and Renovation to: Norris Middle School
5 Norris Square
Norris, TN 37828

A new 9,347 square foot classroom addition for Norris Middle School.

Anderson County Bid Number: 2218
MBI Comm. No.: 210042.04

THE OWNER:

(Name, legal status, address, and other information)

Anderson County School Board
Clay McKamey
101 South Main Street, Suite 500
Clinton, TN 37716

THE ARCHITECT:

(Name, legal status, address, and other information)

MBI Companies Inc., Architect
299 N. Weisgarber Road
Knoxville, TN 37919

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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.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612[™]-2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

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 any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

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

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

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

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, 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 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 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 observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

The official repository for bid documents is Vendor Registry. Contractors, subcontractors, vendors, and others who desire individual drawings and specification sections may obtain them from Knoxville Blueprint, Knoxville, Tennessee, 546-7601, by paying the costs of reproduction, which is not refundable.

§ 3.1.2 Bid deposit is not required.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

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

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 The County requests that requests for clarification or interpretation of the Bidding Documents be submitted via email to Lydia Beckwith at lbeckwith@andersoncountyttn.gov, and purchasing@andersoncountyttn.gov, at least seven days prior to the date for receipt of Bids.
(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall 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 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution. If this information is not provided, the substitution will not be considered.

§ 3.3.3 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.

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

§ 3.3.5 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 posted on Vendor Registry.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

§ 3.4.2 The County anticipates issuing any Addenda 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.

§ 3.4.3 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 Prior to submitting a Bid, each Bidder shall ascertain 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 or identified in the Bidding Documents.

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

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms 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" or as required by the bid form.

§ 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 neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

Cashier's Check or Bidder's Bond for 5 percent of the total amount of the bid including all additive alternates.

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall

affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning 60 days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

Submit with bid cover attached, to:

Purchasing Department
Anderson County Courthouse
100 North Main Street, Room 214
Clinton, TN 37716

§ 4.3.2 The Bid 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.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

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

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, 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 best interests.

§ 5.3.2 Unless otherwise prohibited by law, 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 lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid. Bidder shall also provide a current financial statement proving financial solvency and also provide information regarding any currents or past litigation within the last 5 years. If a bidder has or has had litigation, provide brief explanation and outcome.

§ 6.2 Owner's Financial Capability

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

§ 6.3 Submittals

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

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

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

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder 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, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

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

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

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

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of 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 commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 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 to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

.3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)

| *(Paragraphs deleted)*

.5 Drawings

Number

Title

Date

As noted in List of Drawings

.6 Specifications

Section	Title	Date	Pages
As noted in Table of Contents			

.7 Addenda:

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

.8 Other Exhibits:

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

Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
As noted in Table of Contents			

(Paragraphs deleted)

Additions and Deletions Report for **AIA® Document A701™ – 2018**

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 08:26:40 ET on 02/08/2022.

PAGE 1

Addition and Renovation to: Norris Middle School

5 Norris Square

Norris, TN 37828

A new 9,347 square foot classroom addition for Norris Middle School.

Anderson County Bid Number: 2218

MBI Comm. No.: 210042.04

...

Anderson County School Board

Clay McKamey

101 South Main Street, Suite 500

Clinton, TN 37716

...

MBI Companies Inc., Architect

299 N. Weisgarber Road

Knoxville, TN 37919

PAGE 2

The official repository for bid documents is Vendor Registry. Contractors, subcontractors, vendors, and others who desire individual drawings and specification sections may obtain them from Knoxville Blueprint, Knoxville, Tennessee, 546-7601, by paying the costs of reproduction, which is not refundable.

PAGE 3

~~§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.~~Bid deposit is not required.

...

~~§ 3.2.2 Requests-~~The County requests that requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect be submitted via email to Lydia Beckwith at lbeckwith@andersoncountyttn.gov, and purchasing@andersoncountyttn.gov, at least seven days prior to the date for receipt of Bids.

...

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution. If this information is not provided, the substitution will not be considered.

PAGE 4

§ 3.4.1 Addenda will be ~~transmitted to Bidders known by the issuing office to have received complete Bidding Documents posted on Vendor Registry.~~

...

§ 3.4.2 ~~Addenda will be available where Bidding Documents are on file.~~ The County anticipates issuing any Addenda 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.

...

Cashier's Check or Bidder's Bond for 5 percent of the total amount of the bid including all additive alternates.

PAGE 5

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning 60 days after the opening of Bids, withdraw its Bid and request the return of its bid security.

...

Submit with bid cover attached, to:

Purchasing Department
Anderson County Courthouse
100 North Main Street, Room 214
Clinton, TN 37716

...

§ 4.3.2 ~~Paper copies of the Bid, the bid security, The Bid~~ 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.

PAGE 6

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid. Bidder shall also provide a current financial statement proving financial solvency and also provide information regarding any currents or past litigation within the last 5 years. If a bidder has or has had litigation, provide brief explanation and outcome.

PAGE 7

~~4~~ AIA Document E203™ 2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013.)

...

PAGE 8

As noted in List of Drawings

As noted in Table of Contents

...

~~[]~~ AIA Document E204™ 2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017.)

~~[]~~ The Sustainability Plan:

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

...

Supplementary and other Conditions of the Contract:

...

As noted in Table of Contents

~~9~~ Other documents listed below:
(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, _____, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 08:26:40 ET on 02/08/2022 under Order No. 2114272472 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A701™ – 2018, Instructions to Bidders, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

PART 1 GENERAL:

1.01 GENERAL:

- A The following amendments modify, change, delete from or add to the Instructions to Bidders (AIA Document A701, 2018 Edition). Where any part of the Instructions to Bidders is modified or voided by these amendments, the unaltered provisions of that part shall remain in effect.

1.02 BID SECURITY:

- A Bid security shall be in the form of a bid bond secured by a Surety Company or a Cashier's Check and shall be in the amount of not less than five percent (5%) of the amount of the bid.

1.03 SUBMISSION OF BIDS:

- A In addition to the information listed in Subparagraph 4.3.1, the email containing the bid shall include the plainly marked bid envelope PDF with the bidding contractor's license number, date of expiration of the license, license limitation, and that part of license classification applying to the bid. If this information is not marked on the bid envelope PDF, the Architect and the Owner are prohibited from considering the bid by the requirements of The contractor's Licensing Act of 1976 enacted by the General Assembly of the State of Tennessee, as amended by Chapter 9 and Chapter 406 of the Public Acts of 1977. The names of the Masonry, Roofing, Geothermal, Plumbing, Mechanical, and Electrical Subcontractors, License numbers and date of expiration of their licenses must also be on the bid envelope PDF.

- B Notes: Bidders' attention is called to the provisions of the Contractor's Licensing Act that particular subcontractors (Electrical, Mechanical, HVAC, Masonry, Roofing, Geothermal, etc.) must have a contractor's license if the aggregate amount of their subcontract is equal to or exceeds monetary limits enumerated in that Act for each subcontractor's trade.

1.04 CONTRACT FOR CONSTRUCTION:

- A The Contract for Construction of the Project will be executed on AIA Document A101, current version.

1.05 PERFORMANCE AND LABOR AND MATERIALS PAYMENT BOND:

- A The successful bidder will be required to furnish a Performance Bond and a Labor and Materials Payment Bond in the amount of one hundred percent (100%) of the contract sum. Bonds shall be executed on AIA Document A312.

1.06 DEFINITIONS:

- A All definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201 - 2017 Edition, are applicable to these Instructions to Bidders.

- B Bidding documents include the Invitation to Bid, Instructions to Bidders, the Bid Forms, Agreement between Owner and Contractor and the proposed Contract Documents including any Addenda issued prior to receipt of Bids.

- C Addenda are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the bidding documents, including Drawings and Specifications, by additions, deletions, clarifications or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.

- D All correspondence concerning the bid process shall be addressed to the Architect.

- E A Bid is a complete and properly signed proposal to do the Work or designated portion thereof for the sums stipulated therein, submitted in accordance with the Bidding Documents.
 - F The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which work may be added or from which work may be deleted for sums stated in any Alternate Bids.
 - G A Bidder is a person or entity who submits a Bid.
 - H A Sub-Bidder is a person or entity who submits a bid to a Bidder for materials or labor for a portion of the Work.
- 1.07 EXAMINATION OF DOCUMENTS AND SITE:
- A. Each Bidder, by making his Bid, represents that he has read and understands the Bidding Documents.
 - B. Each Bidder, by making his Bid, represents that he has visited the site and familiarized himself with the local conditions under which the Work is to be performed.
 - C. Each Bidder, by making his Bid, represents that his Bid is based upon the materials, systems and equipment required by the Bidding Documents unless exceptions are noted on the Bid Form.
- 1.08 BIDDING PROCEDURES:
- A. All Bids shall be prepared on the included forms and submitted in accordance with the Instructions to Bidders.
 - B. A Bid is invalid if it has not been received prior to the time and date for receipt of bids indicated in the Invitation to Bid, or prior to any extension thereof issued to the Bidders.
 - C. Unless otherwise provided in any supplement to these Instructions to Bidders, no bidder shall modify, withdraw or cancel his Bid or any part thereof for sixty (60) days after the time designated for the receipt of Bids in the Invitation to Bid.
 - D. Prior to the receipt of Bids, Addenda will be emailed to each person or firm recorded by the Architect and Engineer as having received the Bidding Documents. Addenda issued after receipt of Bids will be mailed or delivered only to the selected Bidder.
 - E. Bids shall not contain any recapitulation of the Work (except as noted on the Bid Form) to be done and no oral or telephone proposals or modifications will be considered.
 - F. The Bidder shall make no additional stipulations on the Bid Form or limit or qualify his Bid in any other manner. Bids so qualified will be subject to disqualification.
 - G. Only written instructions will be binding. The Architect or Engineer will not be responsible for any oral, or telephonic instructions.
 - H. The names of all Subcontractors and material suppliers proposed to be employed shall be submitted for approval by the Owner before they are employed, and all such Subcontractors and material suppliers must be known to perform work of a high standard in their respective trades. If the Owner has reasonable objection to any such proposed person or entity, and notifies the Bidder in writing of such objection, the Bidder shall provide an acceptable substitute person or entity in accordance with Article 5.2 of the General Conditions.

1.09 DISCREPANCIES AND AMBIGUITIES:

- A. Each Bidder shall examine the Bidding Documents carefully and, not later than ten (10) days prior to the date for receipt of Bids, shall make written request to the Architect or Engineer via email only, for interpretations or correction of any ambiguity, inconsistency or error therein which he may discover. The Architect or Engineer will issue any interpretation or correction as an Addendum. Only a written interpretation or correction by Addendum shall be binding. No Bidder shall rely upon any interpretation or correction given by any other method.

1.10 SUBSTITUTIONS:

- A. Each Bidder represents that his Bid is based upon the materials and equipment described in the Bidding Documents.
- B. Where products or systems are specified by naming only one manufacturer and no provisions for substitutions are listed, no substitutions are allowed. Where substitution provisions are listed, they will only be considered if approved by Addenda prior to Bidding.

1.11 QUALIFICATION OF BIDDERS:

- A. A Bidder shall submit to the Owner a properly executed Contractor's Qualification Statement, AIA Document A305 and/or properly documented experience record.
- B. Bidders may be disqualified, and their Bids not considered for any of the following specific reasons:
 - 1. Reason for believing collusion exists among Bidders.
 - a. Submit Non-Collusion Affidavit of Subcontractors after bid. Completion of this form by each subcontractor is required before issuance of Notice to Proceed.
 - 2. The Bidder being interested in any litigation against the Owner.
 - 3. The Bidder being in arrears on any existing contract or having defaulted on a previous contract.
 - 4. Lack of competency as revealed by the financial statement, experience and equipment, questionnaires, or qualification statement.
 - 5. Uncompleted work which in the judgment of the Owner will prevent or hinder the prompt completion of additional work if awarded.
- C. A Bidder shall submit to the Owner a confidential Financial Statement in a sealed envelope.

END OF SECTION

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not a person included within the list created pursuant to Tennessee Code Annotated §12-12-106.

Authorizing Signature: _____

(Sign in BLUE ink)

END OF SECTION

TO: Purchasing Department
Attention: Lydia Beckwith
Anderson County Courthouse
100 North Main Street, Room 214
Clinton, TN 37716

DATED: _____, 2022

Having carefully examined the Invitation and Instructions to Bidders, the General Conditions of the Contract and Specifications entitled "Addition and Renovation to: Norris Middle School", 5 Norris Square, Norris, TN 37828" and the Drawings similarly entitled, as well as the premises and conditions affecting the work, the Undersigned proposes to furnish all materials and labor called for by them for the work in accordance with said documents for the sum of:

_____ Dollars (\$_____).

hereinafter referred to as the Base Bid.

We further submit the following proposal for the described alternates below. The work under these alternates will conform to all applicable provisions of specifications, except as specifically noted otherwise. The amount quoted includes the cost of all incidental omissions, additions, adjustments required because of the change, and the modification and/or removal of existing items as necessary for the new work. All items not specifically identified as an alternate item is included in the Base Bid above.

ALTERNATE 1 – REPLACE CASEWORK AND REPAINT EXISTING CLASSROOMS #216 AND 217

If Alternate 1 for providing material, equipment, labor, and supervision necessary to replace existing casework in Classrooms #216 and 217; and repaint the walls in same classrooms is accepted, add to the Base Bid the sum of

_____ Dollars (\$_____).

Allowance #1: Discretionary Fund of \$100,000 is included in Base Bid.

All other allowances, see Section 01 21 00 – Allowances.

The Bidder hereby acknowledges that the following documents are attached to and made a condition of this Bid:

- | | |
|---|--|
| a) Required Bid Security in the form of: 5% Bid Bond. | b) Attachment 1: Non-Collusion Affidavit |
| c) Attachment 2: Diversity Business Information. | d) Attachment 3: Insurance Requirement Acknowledgement |
| e) Attachment 4: Background Check Compliance Form | f) Attachment 5: Drug Free Workplace Affidavit. |
| g) Attachment 6: Conflict of Interest Form | h) Specification Compliance Form |

If written notice of the acceptance of this bid is mailed, emailed, or delivered to the Undersigned within sixty (60) days after the date of receipt of bids or at any time thereafter before this bid is withdrawn, the Undersigned agrees that he will execute and deliver a Contract on the forms which will be provided him in accordance with bid as specified; and that he will give performance and payment bonds as specified with good and sufficient surety or sureties all within ten (10) days, unless a longer period is allowed after the prescribed forms are presented to him for signature.

The Bidder proposes to complete the work within _____ consecutive calendar days from the Notice to Proceed. The Bidder, by submitting this Bid, agrees to furnish labor, materials, equipment, etc., necessary to complete the work by the above stated dates and to accept the conditions for liquidated damages in the amount of **Five Hundred Dollars (\$500.00)** per calendar day. The above stated dates for completion of this project are of utmost importance to the Owner.

The Undersigned hereby acknowledges receipt of all Contract Documents including all pages of the Specifications, all sheets of the Drawings, and the following Addenda:

Addendum No. ____ Date: _____	Addendum No. ____ Date: _____
Addendum No. ____ Date: _____	Addendum No. ____ Date: _____
Addendum No. ____ Date: _____	Addendum No. ____ Date: _____

Sincerely,

Bidder (If by a Corporation, this Bid must have the Signature Required by its By-Laws)

Title

Firm Name

State of Incorporation

State License No.

Official Address

END OF BID FORM

THIS FORM MUST BE FIRMLY ATTACHED TO THE OUTSIDE OF THE ENVELOPE CONTAINING THE BID. NO BID WILL BE CONSIDERED IF THIS FORM IS INCOMPLETE OR NOT ATTACHED TO THE OUTSIDE OF THE BID ENVELOPE.

To:	Anderson County Lydia Beckwith, Purchasing Department 100 North Main Street, Room 214 Clinton, TN 37716	PROJECT:	Addition and Renovation to: Norris Middle School 5 Norris Square Norris, TN 37828
DATE:		TIME:	
LOCATION:			

NAME OF BIDDER:		BIDDER'S LICENSE CLASSIFICATION:	
LICENSE NO.:	<i>(If bidder is licensed in more than one classification that applies to work being bid, include the license number, classification & expiration date of all classifications)</i>	EXPIRATION DATE:	
		MONETARY LIMITS:	

PART II: IF THE BID INVOLVES: (1) ELECTRICAL WORK, (2) PLUMBING WORK, (3) HEATING, VENTILATION OR AIR CONDITIONING WORK, (4) MASONRY WORK, (5) ROOFING WORK OR (6) GEOTHERMAL WORK, THE BIDDER MUST COMPLETE PART II. IF NOT, ENTER "NONE" IN THE SPACE FORM ITEM (A) BELOW.

Electrical	Plumbing	HVAC	Masonry	Roofing	Geothermal
A. Name of Sub holding electrical license:	A. Name of Sub holding plumbing license:	A. Name of Sub holding HVAC license:	A. Name of Sub holding Masonry license:	A. Name of Sub holding Roofing license:	A. Name of Sub holding Geothermal license:
B. License No. of Contractor holding electrical license:	B. License No. of Contractor holding plumbing license:	B. License No. of Contractor holding HVAC license:	B. License No. of Contractor holding Masonry license:	B. License No. of Contractor holding Roofing license:	B. TDEC Lic.No. of Contractor holding Geothermal license:
C. License classification and limits:	C. License classification and limits:	C. License classification and limits:	C. License classification and limits:	C. License classification and limits:	C. TDEC License classification and limits:
D. Expiration date of electrical license:	D. Expiration date of plumbing license:	D. Expiration date of HVAC license:	D. Expiration date of Masonry license:	D. Expiration date of Roofing license:	D. Expiration date of Geothermal license:

Attachment 1

Non-Collusion Affidavit

- This Non-Collusion Affidavit is material to any contract awarded pursuant to this bid.
- This Non-Collusion Affidavit must be executed by the member, officer, or employee of the bidder who makes the final decision on prices and the amount quoted in the bid.
- Bid rigging and other efforts to restrain competition and the making of false sworn statements in connection with the submission of bids are unlawful and may be subject to criminal prosecution. The person who signs the affidavit should examine it carefully before signing and assure himself or herself that such statement is true and accurate, making diligent inquiry, as necessary, of all other persons employed by or associated with the bidder with responsibilities for the preparation, approval, or submission of the bid.
- In the case of a bid submitted by a joint venture, each party to the venture must be identified in the bid documents, and an affidavit must be submitted separately on behalf of each party.
- The term "complementary bid" as used in the affidavit has the meaning commonly associated with that term in the bidding process and includes the knowing submission of bids higher than the bid of another firm, an intentionally high or noncompetitive bid, and any other form of bid submitted for the purpose of giving a false appearance of competition.
- Failure to file an affidavit in compliance with these instructions may result in disqualification of the bid.

Non-Collusion Affidavit

STATE OF _____

COUNTY OF _____

I state that I am (Title) _____ of (Name of My Firm) _____ and that I am authorized to make this affidavit on behalf of my firm and its owners, directors, and officers. I am the person responsible in my firm to the price(s) and the amount of this bid.

I STATE THAT:

- The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder.
- Neither the price(s) nor the amount of this bid and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.
- No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.
- The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.
- (Name of My Firm) _____, its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last three years been convicted or found liable for any act prohibited by State of Federal law in any jurisdiction involving conspiracy or collusion with respect to bidding on any public contract, except as follows:

I state that (Name of My Firm) _____ understands and acknowledges that the above representation are material and important and will be relied on by Anderson County in awarding the contract(s) for which this bid is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from Anderson County of the true facts relating to submission of bids for this contract.

Representative's Signature

Title

Sworn to and subscribed before me this _____ day of _____, _____.

Notary Public

My commission expires: _____



DIVERSITY BUSINESS INFORMATION

Definitions for Determining Minority, Women And Small-Owned Firms

The guidelines for determining minority, women and small-owned firms are defined as follows:

- “MINORITY”** means a person who is a citizen or lawful permanent resident of the United States and who is:
- Black (a person having origins in any of the black racial groups of Africa);
 - Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);
 - Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or
 - American Indian and Alaskan Native (a person having origins in any of the original peoples of North America).

“MINORITY BUSINESS ENTERPRISE” shall mean a minority business:

A continuing, independent, for profit business which performs a commercially useful function, and is at least 51 percent owned and controlled by one or more minority individuals; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned and controlled by one or more minorities. Whose management and daily business operations are controlled by one or more of minority individuals. “Control” as used in the above clause, means exercising the power to make policy decision. “Operate,” as used in the above clause, means being actively involved in the day-to-day management of the business.

“WOMEN BUSINESS ENTERPRISE” shall mean women business:

A continuing, independent, for profit business which performs a commercially useful function, and which is at least 51 percent owned and controlled by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned and controlled by one or more women. Whose management and daily business operations are controlled by one or more of such individuals. “Control” as used in the above clause, means exercising the power to make policy decision. “Operate,” as used in the above clause, means being actively involved in the day-to-day management of the business.

**DIVERSITY BUSINESS INFORMATION
ANDERSON COUNTY GOVERNMENT**

NOTE: This form is to be submitted only by those who qualify. Bidders do not have to be a minority business to be considered.

IMPORTANT! NOTARY AND COPY OF CERTIFICATION REQUIRED

SECTION 6 – DIVERSITY INFORMATION

VENDOR/CONTRACTOR NAME: _____

Type of Company: (Check One)

() Corporation () Partnership () Limited Liability () Sole Proprietor

Is your company 51% Owned or Operated by a Minority Group? Yes ___ No___

If yes, check the ethnic category and indicate % of ownership:

- American Indian/Alaskan Native ____%
- African American ____%
- Hispanic ____%
- Asian/Pacific Islander ____%
- Other ____% _____ (please indicate)

Please name the entity of certification: _____

Please provide copy of certification letter or certificate

I, HEREBY CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.

Signature: _____ **OFFICER OF THE COMPANY**

Name: _____ **Title:** _____

NOTARY ACKNOWLEDGEMENT:

STATE OF _____)

COUNTY OF _____)

ON _____, 20____, BEFORE ME, _____,

PERSONALLY APPEARED _____, PERSONALLY KNOWN TO ME (OR PROVED TO ME ON THE BASIS OF SATISFACTORY EVIDENCE) TO BE THE PERSON(S) WHOSE NAME(S) IS/ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/SHE/ THEY EXECUTED THE SAME IN HIS/HER/ THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS/HER/ THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON (S) ACTED, EXECUTED THE INSTRUMENT.

WITNESS MY HAND AND OFFICIAL SEAL.

SIGNATURE OF NOTARY: _____

PRINTED FULL NAME OF NOTARY: _____

MY COMMISION EXPIRES: _____

**Attachment 3
Insurance Requirement Acknowledgment**

The bidder awarded this bid or contract will maintain, at their expense adequate insurance coverage to protect them from claims arising under the Worker's Compensation Act, any and all claims for bodily injury and property damage to the Bidder and to Anderson County Government while delivery and service are being done. A certificate of insurance must be on file in the Purchasing Department before work may begin and must be maintained until work is completed.

Only the items marked with an "X" are applicable to this bid and or contract.

- 1. **Workers Compensation Employers Liability** Statutory limits
100,000/100,000/500,000
- 2. **Commercial General Liability** \$500,000 per occurrence
\$1,000,000 aggregate
 - Occurrence Form Only
 - Include Premises Liability
 - Include Contractual
 - Include XCU
 - Include Products and Completed Operations
 - Include Personal Injury
 - Include Independent Contractors
 - Include Vendors Liability
 - Include Professional or E&O Liability
- 3. **Business Auto**
 - Include Garage Liability
 - Include Garage Keepers Liability
 - Copy of Valid Driver's License
 - Copy of Current Motor Vehicle Record
 - Copy of Current Auto Liability Declarations Page
- 4. **Crime Coverages**
 - Employee Dishonesty
 - Employee Dishonesty Bond
- 5. **Property Coverages**
 - Builders Risk
 - Inland Marine
 - Transportation
- 6. Performance Bond Required – A One Hundred Percent (100%) performance or an irrevocable letter of credit in favor of Anderson County Government at a federally insured financial institution. This **MUST** be submitted before purchase order issued.

Certificate Holder Shall Be: Anderson County Government, Clinton, Tennessee, and shall show the bid number and title. Anderson County Government shall be named as an additional insured on all policies except worker's compensation and auto. Insurance carrier ratings shall have a Best's rating of A-VII or better, or its equivalent. Cancellation clause on certificate should strike out "endeavor to" and include a 30-day notice of cancellation where applicable. Any deviations from the above requirements must be disclosed to the Anderson County Purchasing Agent. Any liability deductibles or exclusions must also be disclosed. Exceptions can be granted if applicable.

Bidders Statement and Certification

I understand the insurance requirements of these specifications and will comply in full within **21 (twenty-one) calendar days** if awarded this bid and or contract. I agree to furnish the county with proof of insurance for the entire term of the bid and or contract.

Vendor Name

Authorized Signature

Bid Representative Name (Please Print)

Date

BACKGROUND CHECK COMPLIANCE FORM**ANDERSON COUNTY GOVERNMENT**

PURCHASING DEPARTMENT
 100 N. MAIN STREET, ROOM 214 or 218
 CLINTON, TN 37716
 (865) 457-6251
 (865) 457-6252 (Fax)

BID NUMBER _____

CONTRACT NUMBER _____

BACKGROUND CHECKS Contractors shall comply with Public Chapter 587 of 2007, as codified in Tennessee Code Annotated Section 49-5-413, which requires all contractors to facilitate a criminal history records check conducted by the Tennessee Bureau of Investigation and the Federal Bureau of Investigation for each employee prior to permitting the employee to have contact with students or enter school grounds when students are present.

Any person, corporation or other entity who enters or any employee of any person, corporation or entity who enters into or renews a contract with a local board of education or child care program on or after September 1, 2007, must:

- (1) Provide a fingerprint sample
- (2) Submit to a criminal history records check to be conducted by the Tennessee Bureau of Investigations and the Federal Bureau of Investigations.

Contact the Anderson County School's Human Resources Department at (865) 463-2800 ext. 2811 for fingerprint instructions.

Company or Individuals (Name)

Address

City, State, Zip Code

Telephone Number

()

Contractor License Number (If Applicable)

I agree to abide by Public Chapter 587 of 2007, as codified in Tennessee Code Annotated Section 49-5-413, and certify that I am authorized to sign. The undersigned further agrees if this bid or contract is accepted, to furnish any and all of the Background Check Information on himself and all of his employees as required by law, at the request of Anderson County Government. I hereby agree to release all criminal history and other required information to Anderson County Government, the Tennessee Bureau of Investigation and the Federal Bureau of Investigation in accordance with Tennessee law and I further certify that all information supplied by me regarding this inquiry is true and accurate. I agree to release and hold harmless the above-mentioned governmental entities for the use of this information related to the purposes mandated under Tennessee law. I further certify that I have obtained acceptable criminal history information on all current employees and will obtain said information on future employees associated with the performance of the work defined in this bid or contract, pursuant to Tennessee Code Annotated 49-5-413 and that neither I nor any employee of mine is prohibited from direct contact with school children for the reasons enumerated in Tennessee Code annotated Section §§ 49-5-401 et seq.

Signature _____

Title _____

Printed Name: _____

Date _____

(Please Print Clearly)

(Month, Day, Year)

INTERNAL OFFICE USE ONLY

Notes _____

Attachment 5

DRUG-FREE WORKPLACE AFFIDAVIT

STATE OF _____

COUNTY OF _____

The undersigned, principal officer of _____, an employer of five (5) or more employees contracting with _____ County Government to provide construction services, hereby states under oath as follows:

1. The undersigned is a principal officer of _____ (hereinafter referred to as the "Company"), and is duly authorized to execute this Affidavit on behalf of the Company.
2. The Company submits this Affidavit pursuant to T.C.A. 50-9-113, which requires each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services to submit an affidavit stating that such employer has a drug-free workplace program that complies with Title 50, Chapter 9 of the *Tennessee Code Annotated*.
3. The Company is compliance with T.C.A. 50-9-113

Further affiant saith not.

Principal Officer

STATE OF _____

COUNTY OF _____

Before me personally appeared _____, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that such person executed the foregoing affidavit for the purpose therein contained.

Witness my hand and seal office this _____ day of _____, 20_____.

Notary Public

My commission expires: _____, 20_____.

Attachment 6
ANDERSON COUNTY GOVERNMENT
PURCHASING DEPARTMENT

CONFLICT OF INTEREST AFFIDAVIT/STATEMENT

NOTE: PLEASE SIGN AND RETURN PAGE TWO IN YOUR BID PACKET.

T. C. A. 5-14-114. Conflicts of interest -- Illegal payments.

(a) Neither the county purchasing agent, nor members of the county purchasing commission, nor members of the county legislative body, nor other officials of the county, shall be financially interested, or have any personal beneficial interest, either directly or indirectly, in any contract or purchase order for any supplies, materials, equipment or contractual services used by or furnished to any department or agency of the county government.

(b) Nor shall any such persons accept or receive, directly or indirectly, from any person, firm or corporation to which any contract or purchase order may be awarded, by rebate, gift or otherwise, any money or anything of value whatsoever, or any promise, obligation or contract for future reward or compensation.

(c) A violation of this section is a Class D felony.

T. C. A. 12-4-101 Personal interest of officers prohibited.

(a) (1) It is unlawful for any officer, committee member, director, or other person whose duty it is to vote for, let out, overlook, or in any manner to superintend any work or any contract in which any municipal corporation, county, state, development district, utility district, human resource agency, or other political subdivision created by statute shall or may be interested, to be directly interested in any such contract. "Directly interested" means any contract with the official personally or with any business in which the official is the sole proprietor, a partner, or the person having the controlling interest. "Controlling interest" includes the individual with the ownership or control of the largest number of outstanding shares owned by any single individual or corporation. This subdivision (a)(1) shall not be construed to prohibit any officer, committee person, director, or any person, other than a member of a local governing body of a county or municipality, from voting on the budget, appropriation resolution, or tax rate resolution, or amendments thereto, unless the vote is on a specific amendment to the budget or a specific appropriation or resolution in which such person is directly interested.

(2) (A) Subdivision (a)(1) shall also apply to a member of the board of directors of any not-for-profit corporation authorized by the laws of Tennessee to act for the benefit or on behalf of any one (1) or more counties, cities, towns and local governments pursuant to title 7, chapter 54 or 58.

(B) Subdivision (a)(2)(A) does not apply to any county with a metropolitan form of government and having a population of four hundred thousand (400,000) or more, according to the 1980 federal census or any subsequent federal census.

(b) It is unlawful for any officer, committee member, director, or other person whose duty it is to vote for, let out, overlook, or in any manner to superintend any work or any contract in which any municipal corporation, county, state, development district, utility district, human resource agency, or other political subdivision created by statute shall or may be interested, to be indirectly interested in any such contract unless the officer publicly acknowledges such officer's interest. "Indirectly interested" means any contract in which the officer is interested but not directly so, but includes contracts where the officer is directly interested but is the sole supplier of goods or services in a municipality or county.

Attachment 6
ANDERSON COUNTY GOVERNMENT
PURCHASING DEPARTMENT

CONFLICT OF INTEREST AFFIDAVIT/STATEMENT

(c) (1) Any member of a local governing body of a county or a municipality who is also an employee of such county or municipality and whose employment predates the member's initial election or appointment to the governing body of the county or municipality may vote on matters in which the member has a conflict of interest if the member informs the governing body immediately prior to the vote as follows: "Because I am an employee of (name of governmental unit), I have a conflict of interest in the proposal about to be voted. However, I declare that my argument and my vote answer only to my conscience and to my obligation to my constituents and the citizens this body represents." The vote of any such member having a conflict of interest who does not so inform the governing body of such conflict shall be void if challenged in a timely manner. As used in this subdivision (c)(1), "timely manner" means during the same meeting at which the vote was cast and prior to the transaction of any further business by the body.

(2) Any member of a local governing body of a county or a municipality who is also an employee of such county or municipality and whose employment began on or after the date on which the member was initially elected or appointed to serve on the governing body of the county or municipality shall not vote on matters in which the member has a conflict of interest.

(3) (A) In the event a member of a local governing body of a county or a municipality has a conflict of interest in a matter to be voted upon by the body, such member may abstain for cause by announcing such to the presiding officer.

(B) (i) Any member of a local governing body of a municipality who abstains from voting for cause on any issue coming to a vote before the body shall not be counted for the purpose of determining a majority vote.

(ii) This subdivision (c)(3)(B) shall in no way be construed to apply to any county having a metropolitan form of government and having a population in excess of five hundred thousand (500,000), according to the 1990 federal census or any subsequent federal census.

(d) This section shall apply to a member of the board of directors or officer of any nonprofit corporation required under § 8-44-102(b)(1)(E) to conduct all meetings of its governing body as open meetings.

I have read and understand both T.C. A. 5-14-114 and T. C. A. 12-4-101, and will comply.

NOTE: PLEASE SIGN AND RETURN PAGE TWO IN YOUR BID PACKET.

Contractor or Company Owner (signature)

Date

Attachment 6
ANDERSON COUNTY GOVERNMENT
PURCHASING DEPARTMENT

CONFLICT OF INTEREST AFFIDAVIT/STATEMENT

Contractor or Company Name (print)



Advancement
of Construction
Technology

SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST

Project: _____

 To (A/E): _____

From (Contractor): _____
 Date: _____
 A/E Project Number: _____
 Contract For: _____

List Subcontractors and Major Material Suppliers proposed for use on this Project as required by the Construction Documents. Attach supplemental sheets if necessary.

Section Number	Section Title	Firm	Address	Phone Number (Fax Number)	Contact
----------------	---------------	------	---------	------------------------------	---------

Attachments

Signed by: _____ Date: _____

Copies: Owner Consultants _____ _____ _____ _____ _____ _____ File

MBI #210042.04
ANDERSON COUNTY BID #2218

SECTION 00 45 46
AUTHORIZATION TO DO BUSINESS IN
TENNESSEE

Non-Tennessee resident companies wishing to do business with Anderson County must have proof of a current Certificate of Authority from the Tennessee Secretary of State office before entering into any acquisition agreement or contract with the County per Tennessee Code Annotated 48-11-309. Application forms for this certificate can be downloaded from the Secretary of State web site at www.state.tn.us/sos or by phoning 615-741-2286.

END OF SECTION

TO: Anderson County School Board
101 South Main Street, Suite 500
Clinton, TN 37716

PROJECT: Addition and Renovation to: Norris Middle School
5 Norris Square
Norris, TN 37828

Having carefully and thoroughly examined the Project Manual, including all Specifications, and all Drawings for the above referenced project, the Undersigned proposes to perform all Work contained therein in strict compliance with ALL included requirements.

The undersigned certifies that the following statements are correct and acknowledges each by initially the space adjacent to each:

_____ I understand that manufacturers and products provided on the Drawings and in the Project Manual ARE NOT specified as such to only provide a standard of quality but are, in fact, specified as such to also indicate the exact manufacturer and/or product intended by the Owner, Architect and/or Engineer for use in the construction of the above referenced project.

_____ I will not at any time use or install products that have not been approved in compliance with Division 1 requirements.

_____ I understand that I, nor any of those in my employ, have the authority to determine whether or not a product is "equal" to the specified product or basis of design.

_____ The proposed Base Bid includes all specified manufacturers, products and materials or manufacturers, products and materials which were approved in compliance with Division 1 requirements prior to submission of Bid proposal.

_____ I understand that my bid may be rejected if I did not bid all aspects of the project as specified.

Having certified the above to best of my knowledge, I further certify, by signature below, that failure(s) to comply with the specified products, procedures and/or requirements and the subsequent correction thereof, by course determined by the Architect or Engineer, shall not be grounds for additional compensation of time or monies whether or not such failures were intentional.

Signature & Date _____

Print Name _____

Title _____

Contractor Company Name _____

Contractor's License No. _____

Date of Expiration _____

License Classification _____

Address _____

At your request, MBI Companies, Inc. (MBI) will provide electronic files for your convenience and use in the preparation of documents related to Addition and Renovation to: Norris Middle School, subject to the following terms and conditions:

Electronic File(s) Transfer Fees are based on the following:

- Adobe PDF format:** \$60.00 for the first drawing/file and \$30.00 for each additional drawing/file will be required. This fee is payable in advance and by credit card only.
- Autodesk DWF format:** \$60.00 for the first drawing/file and \$30.00 for each additional drawing/file will be required. This fee is payable in advance and by credit card only.
- Autodesk AutoCAD DWG format:** \$80.00 per drawing/file. This fee is payable in advance and by credit card only.
- Autodesk Revit RVT format (if available):** \$1500.00 Architectural model/file \$1000.00 Structural model/file \$1000.00 Mechanical model/file \$1000 Plumbing model/file \$1000.00 Electrical model/file \$1000.00 Fire protection model \$4000.00 all model sets. This fee is payable in advance and by credit card only.
Large requests will be evaluated for the effort required to bundle and transfer the information and will be assessed on a case by case basis.

MBI makes no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced software.

Data contained on these electronic files is part of MBI's instruments of service and shall not be used by you or anyone else receiving this data through or from you for any purpose other than as a convenience in the preparation of documents pertaining to the referenced project. Any use by you or others, will be your sole risk and without liability or legal exposure to MBI. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against MBI, its officers, directors, employees, agents or sub-consultants which may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold harmless MBI from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from your use of these electronic files.

These electronic files are not Contract Documents. Significant differences may exist between these electronic files and corresponding hard copy Contract Documents due to addenda, change orders or other revisions. MBI makes no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed Contract Documents prepared by MBI and Electronic Files, signed Contract Documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the Contract Documents, including and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other Contractors for the project.

The fees listed above are for costs to un-archive, gather and transmit files only, and under no circumstances shall delivery of the electronic files for use by you be deemed a sale of the file(s) by MBI and MBI makes no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall MBI be liable for any loss of profit or any consequential damages. Usage by any parties of the data contained in the electronic files released shall constitute agreement to these terms.

Any requests for updated electronic files shall incur additional charges.

Please return this completed form by email: mbi@mbicompanies.com. Once the fees have been paid, the file(s) will be transferred to the indicated e-mail address and a receipt will be returned by mail.

Transfer Fee Amount: _____

Email Address: _____ Phone Number: _____

Method of Payment: VISA MasterCard AMEX

Visa Code (Last 3 digits on back of card) _____ AMEX (4 digits on front of card) _____

Credit Card Number and Expiration Date: _____

Name & Address of Cardholder: _____

Cardholder Signature & Date _____

Schedule of Inspection and Testing Agencies

This Statement of Special Inspections / Quality Assurance Plan includes the following building systems:

- | | |
|--|--|
| <input type="checkbox"/> Soils and Foundations | <input type="checkbox"/> Spray Fire Resistant Material |
| <input type="checkbox"/> Cast-in-Place Concrete | <input type="checkbox"/> Wood Construction |
| <input type="checkbox"/> Precast Concrete | <input type="checkbox"/> Exterior Insulation and Finish System |
| <input type="checkbox"/> Masonry | <input type="checkbox"/> Mechanical & Electrical Systems |
| <input type="checkbox"/> Structural Steel | <input type="checkbox"/> Architectural Systems |
| <input type="checkbox"/> Cold-Formed Steel Framing | <input type="checkbox"/> Special Cases |

Qualifications of Inspectors and Testing Technicians

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designation shall appear below the *Agency Number* on the Schedule.

PE/SE	Structural Engineer – a licensed SE or PE specializing in the design of building structures
PE/GE	Geotechnical Engineer – a licensed PE specializing in soil mechanics and foundations
EIT	Engineer-In-Training – a graduate engineer who has passed the Fundamentals of Engineering examination

American Concrete Institute (ACI) Certification

ACI-CFTT	Concrete Field Testing Technician – Grade 1
ACI-CCI	Concrete Construction Inspector
ACI-LTT	Laboratory Testing Technician – Grade 1&2
ACI-STT	Strength Testing Technician

American Welding Society (AWS) Certification

AWS-CWI	Certified Welding Inspector
AWS/AISC-SSI	Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Certification

ASNT	Non-Destructive Testing Technician – Level II or III.
------	---

International Code Council (ICC) Certification

ICC-SMSI	Structural Masonry Special Inspector
ICC-SWSI	Structural Steel and Welding Special Inspector
ICC-SFSI	Spray-Applied Fireproofing Special Inspector
ICC-PCSI	Prestressed Concrete Special Inspector
ICC-RCSI	Reinforced Concrete Special Inspector

National Institute for Certification in Engineering Technologies (NICET)

NICET-CT	Concrete Technician – Levels I, II, III & IV
NICET-ST	Soils Technician - Levels I, II, III & IV
NICET-GET	Geotechnical Engineering Technician - Levels I, II, III & IV

Exterior Design Institute (EDI) Certification

EDI-EIFS	EIFS Third Party Inspector
----------	----------------------------

Other

STRUCTURAL OBSERVATION AGREEMENT

Structural observations shall be provided in Seismic Design Category D, E or F when one of the following conditions exists:

- () 1. The structure is classified as Occupancy Category III, or IV.
- () 2. The height of the structure is greater than 75 feet above the base.
- () 3. The structure is assigned to Seismic Design Category E, is classified as Occupancy Category I or II and is greater than two stories in height.
- () 4. When so designated by the Architect or Engineer of record.
- () 5. When such observation is specifically required by the Building Official.

ENGINEER OR ARCHITECT RESPONSIBLE FOR THE
STRUCTURAL DESIGN (PRINT OR TYPE)

SAME SIGNATURE

DATE

DESIGNATED ENGINEER OR ARCHITECT TO PERFORM
STRUCTURAL OBSERVATION (PRINT OR TYPE)

SAME SIGNATURE

DATE

Contractor's Request for Information (RFI)

Project Name:	Contract No.:	Date:	RFI No.:
Contractor's Name:	To:		
Subject:			

References

Area(s):
Specification Section(s):
Drawing No.:
Other References:
Problem / Information Requested: <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>

Information Requested by:

Reply needed by:

Contractor's Interpretation and Proposed Resolution: <hr/> <hr/> <hr/> <hr/> <hr/>

Architect's / Engineer's Evaluation and Response

<hr/> <hr/> <hr/>			
Disposition:	Clarification Only	Sketch or Drawing	Other
Approval:	Project Manager	Owner	Contractor

To:
Attn:
Specified Item:

Project:
Proposed Substitute:

1. The following are attached (Mark all that apply):

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Complete Description

Laboratory Tests

Information on the availability of maintenance services and replacement materials for proposed substitute(s)

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

Catalog

Spec Data

Names, addresses, and phone numbers of fabricators and suppliers for proposed substitute(s)

2. This substitution will have the following effects on dimensions, gauges, weights, etc.:

3. This substitution will have the following effects on wiring, piping, ductwork, etc.:

4. This substitution will have the following effects on other trades:

5. This substitution will have the following effect on construction Schedules:

6. The proposed substitute(s) differs from the specified product(s) in quality and performance as follows:

7. Manufacturers guarantees for the substitute(s) and the specified product(s) are (check one):

the same

different (if different, explain below)

8. If the proposed substitution is accepted, it will result in:
 no cost impact **a cost increase of**
 a cost decrease of _____
(If change in cost is indicated, itemization on specified Cost Itemization Form is attached)

9. License fees or royalties are pending on the proposed substitute.
 No **Yes** (if yes, explain below)

10. The undersigned or the firm represented shall pay for additional studies, investigations, submittals, redesign, and analysis by the Designer necessitated by this substitution request.

Substitutions must be requested in accordance with applicable Contract requirements. After bidding, substitutions are to be submitted only by Contractor. Substitute products should not be ordered or installed without written acceptance.

Submitted by: _____ **Date:** _____
Sign here: _____
Name: _____ **Telephone:** _____
type or print: _____
for: _____
Name of firm: _____
Address: _____
Street address: _____
and mailing address _____
if different: _____
City, State, _____
and Zip Code: _____

Designer's Review Comments:

- | | |
|---|---|
| <input type="checkbox"/> Accepted | <input type="checkbox"/> Rejected |
| <input type="checkbox"/> Accepted as noted | <input type="checkbox"/> Rejected (received too late) |
| | <input type="checkbox"/> Rejected (submittal incomplete) |

Additional comments:

For the Designer: _____ **Date:** _____
Signature here: _____



AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

Addition and Renovation to: Norris Middle School
5 Norris Square
Norris, TN 37828

Anderson County Bid Number: 2218
MBI Comm. No.: 210042.04

THE OWNER:

(Name, legal status and address)

Anderson County School Board
Clay McKamey
101 South Main Street, Suite 500
Clinton, TN 37716

THE ARCHITECT:

(Name, legal status and address)

MBI Companies Inc.
299 N. Weisgarber Road
Knoxville, TN 37919

TABLE OF ARTICLES

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- 3 CONTRACTOR
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- 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
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- 12 UNCOVERING AND CORRECTION OF WORK
- 13 MISCELLANEOUS PROVISIONS

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.

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

Init.

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Init.

/

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

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

§ 1.1.3 The Work

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

§ 1.1.4 The Project

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

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

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

§ 1.1.8 Initial Decision Maker

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

§ 1.2 Correlation and Intent of the Contract Documents

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

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

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

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

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

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

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

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

§ 1.6 Notice

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

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

§ 1.7 Digital Data Use and Transmission

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

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

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

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

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

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

§ 2.3 Information and Services Required of the Owner

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

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

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

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

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

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

§ 2.4 Owner's Right to Stop the Work

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

§ 2.5 Owner's Right to Carry Out the Work

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

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

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

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

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

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

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

§ 3.3 Supervision and Construction Procedures

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

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

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

§ 3.4 Labor and Materials

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

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

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

§ 3.5 Warranty

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

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

§ 3.6 Taxes

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

§ 3.7 Permits, Fees, Notices and Compliance with Laws

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

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

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

§ 3.7.4 Concealed or Unknown Conditions

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

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

§ 3.8 Allowances

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

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

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

§ 3.9 Superintendent

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

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

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

§ 3.10 Contractor's Construction and Submittal Schedules

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

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

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

§ 3.11 Documents and Samples at the Site

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

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

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

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

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

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

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

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

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

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

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

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

§ 3.13 Use of Site

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

§ 3.14 Cutting and Patching

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

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

§ 3.15 Cleaning Up

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

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

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

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

§ 3.18 Indemnification

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

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

ARTICLE 4 ARCHITECT

§ 4.1 General

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

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

§ 4.2 Administration of the Contract

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

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

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

§ 4.2.4 Communications

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

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

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

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

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

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

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

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

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

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

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

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

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

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

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

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

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

§ 5.3 Subcontractual Relations

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

§ 5.4 Contingent Assignment of Subcontracts

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

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

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

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

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

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

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

§ 6.2 Mutual Responsibility

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

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

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

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

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

§ 6.3 Owner's Right to Clean Up

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

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

§ 7.2 Change Orders

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

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

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

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

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

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

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

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

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

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

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

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

§ 7.4 Minor Changes in the Work

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

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

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

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

§ 8.2 Progress and Completion

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

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

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

§ 8.3 Delays and Extensions of Time

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

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

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

§ 9.2 Schedule of Values

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

§ 9.3 Applications for Payment

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

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

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

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

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

§ 9.4 Certificates for Payment

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

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

§ 9.5 Decisions to Withhold Certification

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

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

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- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

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

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

§ 9.6 Progress Payments

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

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

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

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

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

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

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

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

§ 9.7 Failure of Payment

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

§ 9.8 Substantial Completion

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

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

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

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

§ 9.9 Partial Occupancy or Use

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

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

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

§ 9.10 Final Completion and Final Payment

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

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

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

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

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

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

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

§ 10.2 Safety of Persons and Property

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

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

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

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

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

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

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

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

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials and Substances

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

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

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

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

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

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

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

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

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

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act

or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

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

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

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

§ 11.3 Waivers of Subrogation

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

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

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

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

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

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

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

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

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

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

§ 12.2.2 After Substantial Completion

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

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

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

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

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

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

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

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

§ 13.2 Successors and Assigns

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

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

§ 13.3 Rights and Remedies

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

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

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and

approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

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

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

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

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

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

§ 13.5 Interest

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

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

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

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

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

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

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

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

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

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

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

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

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

§ 14.3 Suspension by the Owner for Convenience

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

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

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

§ 14.4 Termination by the Owner for Convenience

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

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

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

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

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

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

§ 15.1.2 Time Limits on Claims

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

§ 15.1.3 Notice of Claims

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

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

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

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

§ 15.1.5 Claims for Additional Cost

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

§ 15.1.6 Claims for Additional Time

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

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

§ 15.1.7 Waiver of Claims for Consequential Damages

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

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

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

§ 15.2 Initial Decision

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

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

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

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

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

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

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

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

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

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

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

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

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

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

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

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

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

§ 15.4.4 Consolidation or Joinder

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

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

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



Additions and Deletions Report for **AIA® Document A201® – 2017**

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 08:29:10 ET on 02/08/2022.

PAGE 1

Addition and Renovation to: Norris Middle School
5 Norris Square
Norris, TN 37828

Anderson County Bid Number: 2218
MBI Comm. No.: 210042.04

...

Anderson County School Board
Clay McKamey
101 South Main Street, Suite 500
Clinton, TN 37716

...

MBI Companies Inc.
299 N. Weisgarber Road
Knoxville, TN 37919

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, _____, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 08:29:10 ET on 02/08/2022 under Order No. 2114272472 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)

PART 1 GENERAL:

1.01 The following amendments modify, change, delete from or add to the General Conditions of the Contract for Construction (AIA Document A201, 2017 Edition), hereinafter referred to as the General Conditions. Where any part of the General Conditions is modified or voided by these amendments the unaltered provisions of that part shall remain in effect.

1.02 INTENT OF CONTRACT DOCUMENTS:

A. Add the following Subparagraphs 1.2.4 and 1.2.5 at the end of Paragraph 1.2, Correlation and Intent of the Contract Documents:

1.2.4 If there is any conflict or discrepancy within or between any of the Contract Documents involving the quality or quantity of work required, it is the intention of the Contract that the work of highest quality or greatest quantity shown or specified shall be furnished, unless such conflict or discrepancy shall have been brought to the Architect's attention and clarified by Addendum prior to the opening of bids.

1.2.5 Whether or not the word "ALL" is used in the specifications, coverage is intended to be complete, except where partial coverage is specifically and expressly noted. In all cases where an item is referred to in the singular number, it is intended that the reference shall apply to as many such items as are required to complete the work. **Words such as "Install", "Provide", "Furnish", and "Supply" shall be construed as meaning complete furnishing, installing, and constructing unless modified by additional information.**

1.03 DOCUMENTS FURNISHED TO THE CONTRACTOR:

A. Revise Subparagraph 1.5.2 to read as follows:

Copies of the Drawings and Specifications can be obtained by the General Contractor at the cost of reproduction from the print house of their choice subject to the provisions of Paragraph 1.5, Ownership and use of Drawings, Specifications, and other Instruments of Service. All Drawings and Specifications acquired by the Contractor shall be subject to the provisions of Paragraph 1.5, Ownership and use of Drawings, Specifications, and other Instruments of Service.

B. Add Subparagraph 2.3.7 at the end of Paragraph 2.3, Information and Services Required of the Owner:

2.3.7 Electronic data files produced by the Architect containing information about the project are instruments of service and shall be subject to the provisions of Paragraph 1.5, Ownership and Use of Drawings, Specifications, and Other Instruments of Service. Electronic data files are not Contract Documents and differences may exist between these electronic files and the hard copy documents issued as Contract Documents. These files may be made available to the Contractor for convenience in preparing documents relating to the project upon execution of an electronic files release and payment of transfer fees as stated in the electronic files release.

1.04 REVIEW OF CONTRACT DOCUMENTS:

A. Add the following Subparagraph 3.2.5 at the end of Paragraph 3.2, Review of Contract Documents and Field Conditions by Contractor:

3.2.5 Should discrepancies or conflicts in the requirements of the Drawings and Specifications be discovered after the work has started, the Contractor shall report such discrepancies or conflicts to the Architect immediately and no work affected thereby shall be started, or if started, shall be stopped immediately until the Contractor and the Architect agree upon clarification of the discrepancy or conflict.

1.05 PERMITS, FEES AND NOTICES:

- A. Add the following Subparagraph 3.7.6 at the end of Paragraph 3.7, Permits, Fees, Notices, and Compliance with Laws:

3.7.6 The Contractor shall obtain a Certificate of Occupancy from the Building Inspection Department having jurisdiction for each phase of the project as it is completed and ready for occupancy and shall deliver such certificate to the Architect.

1.06 SUBMITTALS:

- A. Add the following Subparagraphs 3.12.11 and 3.12.12 at the end of Paragraph 3.12, Shop Drawings, Product Data and Samples:

3.12.11 Additional provisions pertaining to shop drawings and samples are included in Division 1, General Requirements.

3.12.12 Submittals that have not been marked as reviewed, signed, and dated by the Contractor may be returned by the Architect without action.

1.07 SUBCONTRACTURAL RELATIONS:

- A. Add the following Subparagraphs 5.3.1 and 5.3.2 to Paragraph 5.3, Subcontractual Relations:

5.3.1 The Contractor shall be directly responsible for all of the work included in the Contract, whether performed by his own forces or by his subcontractors. Except in extreme emergencies, all instructions, clarifications, and approvals will be given by the Architect to subcontractors only through the Contractor and all shop drawings, samples, and correspondence from the subcontractor shall be submitted to the Architect through the Contractor.

5.3.2 Insofar as it does not affect the quality of workmanship or materials, the Contractor shall settle all questions of responsibility arising among his various subcontractors and shall determine the extent of work and responsibility of each of the subcontractors.

1.08 CHANGES IN THE WORK:

- A. Change Sub-subparagraph .5 of Subparagraph 7.3.4 to the following:

.5 Overhead and profit of which the maximum amount of allowable given in this Subparagraph shall be considered to include, but is not limited to, job-site staff and office expense, incidental job burdens, small tools, bonds, insurance and home office overhead allocation. The percentages for overhead and profit shall not exceed the following:

To Contractor on work performed by other than its own forces - 5% profit;

To first-tier Subcontractor on work performed by its Sub-subcontractors - 5% profit; and

To Contractor and/or Subcontractors for that portion of the work performed with their respective forces - 10% overhead and 5% profit.

- B. Add the following Subparagraph 7.4.1 to Paragraph 7.4, Minor Changes in the Work:

7.4.1 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and subcontractors. **Where major cost items are subcontracts, they shall be itemized also. In no case will a change involving over \$500.00 be approved without such itemization.**

1.09 APPLICATIONS FOR PAYMENT:

- A. Add the following Clauses 9.3.4 and 9.3.5, in Paragraph 9.3, Applications for Payment:

9.3.4 Until Substantial Completion, the Owner will pay ninety five percent (95%) of the amount due the Contractor on account of progress payments, holding the remaining five percent (5%) of the amount of such Contract as retainage. At Substantial Completion and with the full knowledge of the Contractor's Surety, retainage will be reduced to an amount sufficient in the Architect's opinion to complete the Work should the Contractor default.

9.3.5 The Contractor is to use the 1992 Edition of AIA Document G702, Application and Certificate for Payment. **Beginning with the second Application for Payment, the Contractor shall verify that he has paid all subcontractors and major material suppliers those respective amounts representing all work and materials which have formed the basis of previous progress payments.** The application shall be submitted in three notarized copies.

1.10 PROGRESS PAYMENTS:

- A. Revise Subparagraph 9.6.1, to read as follows:

Unless otherwise provided in the agreement, the Owner will make progress payments to the Contractor on or about the fifteenth (15th) day of each calendar month on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month. In preparing estimates, materials delivered to and properly stored on the site shall be given consideration. **Materials stored off-site shall not be paid for by the Owner unless the Contractor furnishes a certificate of insurance for that material showing the Owner as the Owner of said material.**

- B. Add Subparagraph 9.6.9 at the end of Subparagraph 9.6, Progress Payments.

9.6.9 Upon commencement of the work, an escrow account as provided by Tennessee Code Annotated, Section 4-15-102; Section 66-11-144 and Title 66, Chapter 34, shall be established in a financial institution chosen by the Contractor and approved by the Owner. The escrow agreement shall provide that the financial institution will act as escrow agent, will pay interest on funds deposited in such account in accordance with provisions of the escrow agreement and will disburse funds from the account upon the direction of the Owner as set forth below. Compensation to the escrow agent for establishing and maintaining the escrow account shall be paid from interest accrued to the escrow account.

1.11 COSTS FOR DELAYS IN SUBSTANTIAL COMPLETION:

- A. Add the following Subparagraph 9.8.6 at the end of Paragraph 9.8, Substantial Completion:

9.8.6 As actual damages for any delay in completion are impossible of determination, the Contractor and his sureties shall be liable for and shall pay to the Owner the sum of Five Hundred Dollars (\$500.00) as fixed, agreed, and liquidated damages for each calendar day of delay until a Certificate of Substantial Completion is executed by the Owner, Architect, and Contractor.

1.12 FINAL PAYMENT:

- A. In Subparagraph 9.10.2, item (6), delete the words "if required by the Owner"; and replace the words "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" with the following: "Contract Close Out Submittals as enumerated in Section 01 33 00 Submittal Procedures and as reviewed and approved by the Architect.

1.13 COSTS FOR DELAYS IN FINAL COMPLETION

- A. Add the following Subparagraph 9.10.6 at the end of Paragraph 9.10, Final Completion and Final Payment:

9.10.6 If after Substantial Completion of the work and issuance of the Punch List, Final Completion of the Work is delayed beyond the time allotted for completion of the Punch List through no fault of the Owner or the Architect, the Contractor shall be liable for such ongoing costs as the Architect shall incur on the Project. Such costs shall be computed and billed to the Contractor at the Architect's standard hourly rates in effect at the time the work is executed. Payment shall be required within thirty (30) days of invoice. Interest shall accrue at one percent (1%) per month on past due amounts. Contractor shall be liable for all legal fees if legal action is required for collection of unpaid amounts.

1.14 CONTRACTOR'S LIABILITY INSURANCE:

A. In Subparagraph 11.1.1 in the second line, following the phrase "in the jurisdiction where the Project is located", insert the following clause: ", and to which the Owner has no reasonable objections,".

1.15 LIMITS OF CONTRACTOR'S LIABILITY INSURANCE:

Add the following Clause 11.1.2.1 to Subparagraph 11.1.2:

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

A. Workmen's Compensation:

- | | | |
|----|-----------------------|--------------------------------------|
| 1. | State: | Statutory |
| 2. | Employer's Liability: | \$100,000.00 Each Accident |
| | | \$500,000.00 Disease - Policy Limit |
| | | \$100,000.00 Disease - Each Employee |

B. Comprehensive General Liability (including Premises-Operations; Independent Contractors' Products/Completed Operations; Contractual; Personal injury):

1. Bodily Injury & Property Damage, combined single limit:

Each Occurrence:	\$1,000,000.00
Annual Aggregate:	\$1,000,000.00
2. Products/Completed Operations to be maintained for One Year after Final Payment.

\$5,000,000.00 Aggregate

3. Property Damage Liability Insurance shall provide X, C, and U Coverage, and Coverage for any Special Hazards such as Blasting.

C. Comprehensive Automobile Liability (including Owned, Hired and Non-Owned):

1. Bodily Injury/Property Damage Combined: \$500,000

D. Umbrella Liability: \$2,000,000

1.16 OWNER'S LIABILITY INSURANCE:

A. Replace Paragraph 11.2.1 with the following:

The Contractor shall take out and furnish to the Owner and maintain during the life of this Contract complete Owner's Protective Liability Insurance in amounts as specified in the limits of Contractor's Liability Insurance for Bodily Injury and Property Damage. This policy shall be made out in the name of the Owner and the Architect.

1.17 PROPERTY INSURANCE (BUILDER'S RISK)

- A. Remodel, use 11.2: Owner to provide property insurance.

1.18 PERFORMANCE BOND AND PAYMENT BOND

- A. Change Subparagraph 11.1.2 to read as follows:

11.1.2 The Contractor shall execute a performance bond and a payment bond in an amount equal to one hundred percent (100%) of the Contract Sum and a payment bond covering and including labor and materials in an amount equal to one hundred percent (100%) of the Contract Sum. Bond shall be executed on AIA Document A311 and A312. Such bond shall be from a surety Company authorized to transact business in the State of Tennessee and Company shall be registered in Federal Register, Department of the Treasury, Fiscal Service, Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies; Notice. Attorneys in Fact who sign any bonds must file with each instrument a certified and effective dated copy of their power of attorney.

- B. Add the following Subparagraph 11.1.2.1 to the end of Subparagraph 11.1.2:

11.1.2.1 Mechanical, Plumbing and Electrical Subcontractors shall execute a performance bond in an amount equal to one hundred percent of the Contract Value of their portion of the work and a payment bond covering and including labor and materials in an amount equal to one hundred percent (100%) of the Contract Value of their portion of the work. Performance and Labor and Material Payment Bonds shall be executed on AIA Form A311 and A312. Such bond shall be from a surety Company authorized to transact business in the State of Tennessee and Company shall be registered in Federal Register, Department of the Treasury, Fiscal Service, Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies; Notice. Attorneys in Fact who sign any bonds must file with each instrument a certified and effective dated copy of their power of attorney.

1.19 INSPECTIONS AND CORRESPONDENCE:

- A. Add the following Subparagraph 13.4.7 to the end of Paragraph 13.4, Tests and Inspections:

13.4.7 Inspections and or correspondence by the Architect required due to failure by the Contractor to obtain inspections and approval from the Public Authorities having jurisdiction are beyond the scope of Construction Contract Administration for the Architect. As additional services, the Contractor will be billed a minimum fee of Five Hundred Dollars (\$500.00) per occurrence plus the Architect's time at the Architect's standard hourly rate for the personnel required to perform these functions.

1.20 INTEREST:

- A. Revise Paragraph 13.5 to read as follows:

"Payments due and unpaid for thirty (30) days under the Contract Documents shall bear interest from the date thirty (30) days after payment is due at the rate of 1/2% (0.5 percent) per month; 6% APR.

1.21 ARBITRATION:

- A. Delete Paragraph 15.4 Arbitration, entirely and delete all references to arbitration elsewhere in the General Conditions.

1.22 TIME:

- A. Time is an essential consideration of the Contract and work shall commence on the date to be specified in a written notice to the Contractor to proceed and shall progress with a proper and sufficient force of workmen and ample supply of materials and equipment to complete the Contract within the time limit agreed to in the Contract for Construction.

1.23 SUBSTITUTIONS:

- A. All requests shall be submitted to the Architect in writing with a fully executed substitution request form and shall clearly define and describe materials, methods or equipment for which approval is requested.
- B. Prior to Execution of a Contract for Construction:
1. If any Contractors desire to substitute any firms, materials, brands, methods, etc., other than specified, he may have the privilege at any time prior to ten days before bidding, of submitting these matters to the Architect for approval.
 2. Requests shall be submitted by the General Contractor. Direct requests by manufacturer or material suppliers will not be considered.
 3. If such submissions are approved by the Architect or if the Architect shall decide to enlarge the scope of the Specifications, such approvals or additional information will be made by Addendum to the Contractor.
- C. After Execution of a Contract for Construction:
1. Substitutions after execution of a Contract for Construction will, generally, not be considered, except under unusual circumstances, such as strikes, lockouts, bankruptcy, discontinuing of a product, etc.
 2. Requests for substitutions shall be made in writing to the Architect within ten (10) days of the date that the Contractor ascertains that he cannot obtain the material or equipment specified.
 3. Requests shall be accompanied by complete description of the material or apparatus to be submitted. On request from the Architect, samples of any of all such items shall be submitted and/or set up as directed for inspection and consideration. The amount of credit or extra cost to the Owner on account of the substitution shall be a part of this request.
 - a. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - i. Statement indicating why specified material or product cannot be provided.
 - ii. The amount of credit or extra cost to the Owner on account of the substitution
 - iii. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - iv. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - v. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - vi. Samples, where applicable or requested.
 - vii. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - viii. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

- ix. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
- x. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
- xi. 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.

D. "Or Approved Equal" or "Or Approved Substitution"

- 1. Where the phrase "or approved equal" or "approved substitution" occurs in the Contract Documents, do not assume that material, equipment, or methods will be approved as equal by the Architect unless the item has been specifically approved for this work by the Architect
 - a. Color choices will be one of the determining factors for approval.
- 2. The decision of the Architect will be final.

1.24 STANDARDS:

- A Any material or other work specified by reference to the number, symbol, or title of a specific standard, such as American National Standards Institute (ANSI) Standard, a Federal Specification, a trade association standard, or other similar standard, shall conform to the requirements in the latest revision thereof or any amendment or supplement thereto in effect on the date of the drawings and specifications, except as limited to type, class or grade, or as modified in such reference.
- B The standards referred to, except as modified in the specification, shall have full force and effect as though recited for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements. The Architect will furnish, upon request, information as to how copies of the standards referred to may be obtained.
- C Where material or work is specified by reference to conform to standards such as listed in Paragraph A above, or to Codes, Laws, and Regulations, but specific provisions of the Contract Drawings or Contract Specifications exceed the requirements of such references, the Contract Drawings and Specifications shall govern.

1.25 MANUFACTURER'S DIRECTIONS:

- A All manufactured articles, material and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturer's instructions and recommendations. Any conflicts between such manufacturer's instructions and recommendations and the specifications shall be brought to the attention of the Architect and the procedures reconciled before proceeding with the work.

1.26 GUARANTEE:

- A All work under this Contract shall be guaranteed for a period of one (1) year after execution of Certificate of Substantial Completion against defects caused by the use of inferior materials or workmanship. Guarantee period of incomplete items at time of execution of Certificate of Substantial Completion shall commence on date of installation into building. Repair and/or replace all such defective materials or equipment and any work damaged thereby or make any other adjustment necessary without additional cost to the Owner.

1.27 LAYING OUT WORK:

- A The Contractor shall, immediately upon entering the projects for the purpose of beginning work, locate all general reference points and be responsible for all lines, elevations, and measurements.

PART 2 PRODUCTS:

NOT USED

PART 3 EXECUTION:

NOT USED

END OF SECTION

46. Labor Standards - Davis-Bacon and Related Acts

If the total amount of this contract exceeds \$2,000, the Federal labor standards set forth in the clause below shall apply to the development or construction work to be performed under the contract.

(a) Minimum Wages.

- (1) All laborers and mechanics employed under this contract in the development or construction of the project(s) involved will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the regular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.
 - (2) (i) Any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The Administrator of the Wage and Hour Division shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met: (A) The work to be performed by the classification requested is not performed by a classification in the wage determination; and (B) The classification is utilized in the area by the construction industry; and (C) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
 - (3) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.
 - (4) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.
- (b) Withholding of funds. The Department of Labor may withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working in the construction or development of the project, all or part of the wages required by the contract, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such

violations have ceased. The Department of Labor may, after written notice to the Contractor, disburse such amounts withheld for and on account of the Contractor or subcontractor to the respective employees to whom they are due.

(c) Payrolls and basic records.

- (1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working in the construction or development of the project. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under 29 CFR 5.5(a)(1)(iv), that the wages of any laborer or mechanic include the amount of costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.
- (2)
 - (i) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Administrator of the Wage and Hour Division. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under subparagraph (c)(1) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1214-0149.)
 - (ii) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:
 - (A) That the payroll for the payroll period contains the information required to be maintained under paragraph (c) (1) of this clause and that such information is correct and complete;
 - (B) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3; and
 - (C) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.
 - (iii) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirements for submission of the "Statement of Compliance" required by subparagraph (c)(2)(ii) of this clause.
 - (iv) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.
- (3) The Contractor or subcontractor shall make the records required under subparagraph (c)(1) available for inspection, copying, or transcription by authorized representatives of the Department of Labor and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Department of Labor or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds.

Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

- (d) (1) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship and Training, Employer and Labor Services (OATELS), or with a State Apprenticeship Agency recognized by OATELS, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by OATELS or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event OATELS, or a State Apprenticeship Agency recognized by OATELS, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (2) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.
- (3) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

- (e) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.
- (f) Contract termination; debarment. A breach of this contract clause may be grounds for termination of the contract and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.
- (g) Compliance with Davis-Bacon and related Act requirements. All rulings and interpretations of the Davis-Bacon and related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.
- (h) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this clause shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the U.S. Department of Labor, or the employees or their representatives.
- (i) Certification of eligibility.
 - (1) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a United States Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).
 - (3) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.
- (j) Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.
 - (1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.
 - (2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the provisions set forth in subparagraph (j)(1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic (including watchmen and guards) employed in violation of the provisions set forth in subparagraph (j)(1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by provisions set forth in subparagraph (j)(1) of this clause.
 - (3) Withholding for unpaid wages and liquidated damages. The Administrator of the Wage and Hour Division its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions set forth in subparagraph (j)(2) of this clause.
- (k) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts all the provisions contained in this clause, and such other clauses as the Department of Labor or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these provisions in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these provisions

47. Non-Federal Prevailing Wage Rates

- (a) Any prevailing wage rate (including basic hourly rate and any fringe benefits), determined under State or tribal law to be prevailing, with respect to any employee in any trade or position employed under the

contract, is inapplicable to the contract and shall not be enforced against the Contractor or any subcontractor, with respect to employees engaged under the contract whenever such non-Federal prevailing wage rate exceeds:

- (1) The applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 3141 et seq.) to be prevailing in the locality with respect to such trade;
- (b) An applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the U.S. Department of Labor (DOL) or a DOL-recognized State Apprenticeship Agency; or
- (c) An applicable trainee wage rate based thereon specified in a DOL-certified trainee program.

See Section 00 73 44 – Wage Rate Determination for the current wage rate determination for this county and project type.

ELEC0760-006 06/01/2020

	Rates	Fringes
ELECTRICIAN (Including Electrical Installer (Alarms)....	\$ 26.87	12.05

 ENGI0917-016 05/01/2017

	Rates	Fringes
Power Equipment Operator		
Backhoe/Trackhoe/Excavator..	\$ 28.26	10.10
Bulldozer.....	\$ 28.26	10.10
Crane.....	\$ 28.26	10.10
Forklift.....	\$ 25.97	10.10
Grader/Blade.....	\$ 25.97	10.10

 * IRON0384-005 05/01/2020

	Rates	Fringes
IRONWORKER, STRUCTURAL AND REINFORCING.....	\$ 28.73	15.36

 LABO0818-001 05/01/2017

	Rates	Fringes
Laborers:		
GROUP 1.....	\$ 19.77	6.53
GROUP 2.....	\$ 20.12	6.53

GROUP 1: Common or General, Landscaping

GROUP 2: Form Work

 PAIN0437-009 05/01/2015

	Rates	Fringes
PAINTER (Including Brush, Roller, Spray and Drywall Finishing/Taper).....	\$ 26.43	10.05

 PLAS0078-001 05/01/2015

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER...	\$ 31.00	.06

PLUM0102-004 05/01/2020

	Rates	Fringes
PIPEFITTER, Includes HVAC Pipe Installation.....	\$ 30.77	14.40

PLUM0102-009 05/01/2020

	Rates	Fringes
PLUMBER (Excluding HVAC Pipe Installation).....	\$ 30.77	14.40

SHEE0005-012 05/01/2019

	Rates	Fringes
SHEET METAL WORKER (Including Metal Building Erector (Metal Siding/Wall Panel and HVAC Duct Installation (Excluding Metal Roof Installation).....	\$ 27.73	14.87

SUTN2009-075 09/21/2009

	Rates	Fringes
CARPENTER (Drywall Hanging Only).....	\$ 13.00	0.25
HVAC MECHANIC (Installation of HVAC Unit Only, Excludes Installation of HVAC Pipe and Duct).....	\$ 12.75	1.49
LABORER: Mason Tender - Brick...	\$ 12.82	0.00
LABORER: Roof Tearoff.....	\$ 9.75	0.49
OPERATOR: Bobcat/Skid Steer/Skid Loader.....	\$ 17.05	0.00
OPERATOR: Mechanic.....	\$ 18.33	3.67
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 13.50	0.00
OPERATOR: Roller.....	\$ 13.98	0.00
ROOFER: Built up Roof.....	\$ 12.74	0.00
ROOFER: Rubber Roof.....	\$ 16.82	4.77
ROOFER: Single Ply Roof.....	\$ 16.50	0.32

SHEET METAL WORKER (Metal Roofs Installation).....\$ 15.64	0.00
TILE FINISHER.....\$ 10.00	0.74
TRUCK DRIVER: Dump Truck.....\$ 12.56	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey.

Example:

PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an

internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Furnish all labor, materials, and equipment, and perform all work to construct, as specified herein and as shown on the accompanying drawings entitled "Addition and Renovation to: Norris Middle School", 5 Norris Square, Norris, TN 37828. The renovation shall be constructed complete and ready for occupancy except for the items specifically excluded in "Work Not Included".
- B. The work shall include selective demolition, building construction, plumbing, heating, ventilating and air conditioning; electrical work; and special equipment, as shown and specified.
- C. Patch any existing work damaged by construction.

1.02 WORK NOT INCLUDED

- A. The following items of work will be provided by the Owner or by others under separate contracts:
 - 1. Wayfinding signage.
 - 2. Toilet accessories not included on drawings: OFCI.
 - 3. Movable furniture unless specifically shown on the drawings and specifications.
 - 4. Security System Equipment.
 - 5. Telephone System Equipment.
 - ~~6.~~ 6. Computer System Equipment.
 - ~~6-7.~~ 6-7. Polished Concrete Finishing.
 - ~~7-8.~~ 7-8. Any other items noted on the drawings as Not in Contract (NIC); or Owner Furnished Contractor Installed (OFICI).
- B. The following work in connection with the items listed in paragraph 1.02A preceding shall be part of the General Contract work:
 - 1. Verification of correct location of electrical receptacles, telephone outlets, water and waste connections and similar outlets to suit equipment arrangement.
 - 2. Provision of telephone outlet boxes and conduit turned out above ceiling for use by owner's telephone contractor.

1.03 OCCUPANCY OF THE BUILDING DURING CONSTRUCTION

- A. The Contractor shall schedule and organize his work in such a manner and use such methods that will interfere as little as possible with other work in progress on the site and with the operation of adjacent buildings.
- B. The Building will be occupied during the course of construction. The Contractor shall schedule his work in a manner to minimize disruption of use of existing facilities by his construction activities.

1.04 CONTRACTOR'S USE OF PREMISES

- A. Before construction is started the Contractor shall confer with the Architect and the Owner and arrange for available trucking and storage space for the delivery of materials, storage space for materials and equipment, and parking space for his workmen.
- B. Construction operations and storage of materials and equipment shall be restricted to areas of the site mutually agreed upon and in such a manner as not to block access of fire fighting equipment to the building and facilities.

- C. Construction vehicular traffic and the operation of construction equipment such as cranes, bulldozers, and other similar equipment shall be carefully supervised and controlled to avoid damage to existing structures and facilities which are to remain in place.

1.05 VERIFICATION OF DIMENSIONS

- A. Dimensions, elevations, and locations shown on the drawings in reference to existing structures and utilities are the best available data obtainable but are not guaranteed by the Architect or the Owner and the Architect and the Owner will not be responsible for their accuracy.
- B. Before proceeding with any work dependent upon the data involved, the Contractor shall field check and verify all dimensions, grades, line levels, or other conditions of limitations at the site and building to avoid construction errors. If any work is performed by the Contractor or by his Subcontractors prior to adequate verification of applicable data, any resultant extra cost for adjustment of work to conform to existing limitations shall be borne by the Contractor without reimbursement or compensation by the Owner.

1.06 CONTROL POINTS AND LAYOUT

- A. The initial lines, grades, and dimensions necessary for the location and control of the work under the Contract are shown on the Contract Drawings.
- B. The Contractor shall provide for himself all additional and supplementary lines and grades as may be necessary to layout the work and ensure proper control of the work until completed. It shall be the Contractor's responsibility to satisfy himself as to the accuracy of all measurements before construction.

1.07 SUBSTANTIAL COMPLETION OF THE WORK

- A. Upon substantial completion of any phase of the work, the Owner shall assume complete responsibility for the maintenance and operation of the heating, ventilating and air conditioning system and service utilities in that portion of the project.
- B. The Owner shall also become responsible for all other maintenance and damage and ordinary wear and tear and, with the exception of items under guarantee, the cost of repairs or restoration during the period between substantial and final completion.
- C. The Owner shall have the responsibility to have in effect all necessary insurance for protection against any losses not directly attributable to the Contractor's negligence.
- D. Upon substantial completion, payments for work in the substantially complete portion of the work shall be released to the Contractor, except for the retainage and an amount to cover the cost of the incomplete or deficient items included in the punch list made at the inspection to determine substantial completion. This amount shall be approximately the value of the punch list items as estimated by the Architect.
- E. The Contractor shall arrange a schedule so that punch list items are completed in the designated time by working during regular working hours. The Contractor shall be afforded access to the occupied portion of the building to perform this work during regular working hours.

1.08 ENVIRONMENTAL HAZARDOUS PRODUCTS, MATERIALS, WASTE

- A. Do not incorporate in the Work hazardous materials or products as currently defined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or Environmental Protection Agency (EPA) regulations, rules, or requirements, as amended, unless the Contract Documents give no other option than to provide a material or product which contains a hazardous material, component, constituent, waste, or leachate. In studying the Contract Documents and carrying out the Work, report at once to the Designer the

discovery of a product or material which contains hazardous materials, components, constituents, waste, or leachate.

- B. Do not incorporate in the Work a product or material which contains concentrations of a constituent, component, or material above the threshold levels which would require adherence to hazardous waste disposal regulations as currently defined or could cause a release or threat of release of a hazardous substance at a level that would require a remedial response or removal action as currently defined by RCRA, CERCLA, or the EPA.
- C. Select materials and products meeting specified requirements which comply with EPA requirements as regards hazardous materials content. In making requests for substitutions, determine that materials and products proposed for substitution comply with RCRA, CERCLA, and EPA requirements.

1.09 BUILDING PRODUCTS USE

- A. It is the responsibility of the Contractor to inform himself concerning the application of the products he uses to follow the directions of the Architect and manufacturer.
- B. In the event of disagreement between the Contract Documents and the manufacturer's directions, the Contractor will obtain written instructions from the Architect before proceeding with the installation.
- C. If the Contractor has knowledge of or reason to believe the likelihood of failure, he will transmit such knowledge to the Architect, and ask for written instructions before proceeding with the work.

1.10 OWNERSHIP OF REMOVED MATERIALS AND EQUIPMENT

- A. All removed existing materials and equipment designated to be removed which are not to remain the property of the Owner or are not noted to be reused in the new work shall become the property of the Contractor and shall be removed from the premises and site and disposed of by him.

1.11 SEPARATE CONTRACTS

- A. The Owner may award separate contracts in connection with the project. The work in any such separate contracts may proceed simultaneously with the execution of this Contract. The Contractor shall coordinate operations with any separate contractors. The Contractor will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his subcontractors, shall keep himself informed of the progress and the detailed work of separate contractors and shall notify the Architect immediately of the lack of progress or defective workmanship that will interfere with his own operations. Failure of the Contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by separate contractors shall be construed as acceptance of him of the state of the work as being satisfactory for proper coordination with his own work.
- B. The separate contractors will provide competent foremen or supervisors for the installation of their equipment, and they are to confer with the Contractor and his subs and other separate contractors where required regarding connections and installations.

1.12 DISCRETIONARY FUND

- A. The General Contractor shall include in the base bid an amount equal to **\$100,000** included in the Base Bid which shall constitute a discretionary fund. This fund shall be used at the discretion of the Architect and the Owner. Upon completion of the work, the Contractor shall credit his final request for payment in the amount of all or any unused portion of this fund.

MBI #210042.04
ANDERSON COUNTY BID #2218

SECTION 01 10 00
SUMMARY

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

- A. This section includes administrative and procedural requirements governing Allowances and Unit Prices.
- B. Allowances included on the drawings or in individual specification sections not specifically listed herein shall be bound by the procedures described herein. The Schedule of Allowances may not be a comprehensive list of all Allowances to be included in the Bid.

1.02 RELATED DOCUMENTS

- A. Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1 General Requirements apply to the work under this section.

1.03 ALLOWANCES

- A. Types of allowances include the following:
 - 1. Allowances as listed hereafter.
 - 2. Discretionary Fund/Contingency Allowance.
- B. Selection and Purchases:
 - 1. At the earliest practical date after award of the Contract, advise the Architect of the date when the final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
 - 2. At the Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
 - 3. Purchase products and systems selected by the Architect from the designated supplier.
- C. Submittals:
 - 1. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
 - 2. Submit invoices or delivery slips to show the actual quantities of materials delivered to the site for use in fulfillment of each allowance.
 - 3. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit costs, and to have this work measured, at the Owner's expense, by an independent surveyor acceptable to the Contractor.
 - 4. Schedule: A "Schedule of Allowances" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials described under each Allowance.
- D. Discretionary Fund/Contingency Allowance:
 - 1. Use the discretionary fund only as directed by the Architect for the Owner's purposes and only by Field Orders Construction Change Directive (AIA Document G714) which indicate amounts to be charged to the allowance.
 - 2. The Contractor's related costs for products and equipment ordered by the Owner under the discretionary fund are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
 - 3. Field Orders Construction Change Directive (AIA Document G714) authorizing use of funds from the discretionary fund will include Contractor's related costs and reasonable overhead and profit margins.
 - 4. At Project closeout, credit unused amounts remaining in the discretionary fund to the Owner by Change Order.
- E. Unused Materials:
 - 1. Return unused materials to the manufacturer or supplier for credit to the Owner, after installation has been completed and accepted.

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

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Unsuitable Soil in Mass Excavation:
 1. Description: Allowance included in the Base Bid for the removal and disposal of 400 cubic yards of unsuitable soil in mass excavation and replacement with compacted Engineered Fill according to [Civil drawing notes](#).
- B. Allowance No. 2: Unsuitable Soil in Trench Excavation:
 1. Description: Allowance included in the Base Bid for the removal and disposal of 40 cubic yards of unsuitable soil in trench excavation and replacement with compacted Stone Fill according to [Civil drawing notes](#).
- C. Allowance No. 3: Rock in Mass Excavation:
 1. Description: Allowance included in the Base Bid for the removal and disposal of 100 cubic yards of rock in mass excavation according to [Civil drawing notes](#).
- D. Allowance No. 4: Rock in Trench Excavation:
 1. Description: Allowance included in the Base Bid for the removal and disposal of 20 cubic yards of rock in trench excavation according to [Civil drawing notes](#).
- E. Allowance No. 5. Reinforced Concrete Foundations:
 1. Description: Allowance included in Base Bid for providing and installing steel reinforced concrete footings according to Section 03 30 00 Concrete.
- ~~F. Allowance No. 6. Geotextile fabric:
 1. Description: Allowance included in Base Bid for providing and installing geotextile fabric each side of stone foundation drainage layer according to Section 31 20 00 Earth Moving.~~
- ~~G.F.~~ Allowance No. 7. Compacted Stone:
 1. Description: Allowance included in Base Bid for providing and installing 60 tons of compacted stone according to [Civil drawing notes](#).
- ~~H.G.~~ Allowance No. 8 Discretionary Fund Allowance:
 1. Description: Allowance included in Base Bid for use at the discretion of the Owner and the Architect according to Section 01 10 00 Summary of the Work.
- ~~H.~~ Allowance No. 9 Emergency Responder Radio Antenna-Repeater System:
 1. Description: Allowance included in Base Bid for build-out of Emergency Responder Radio Antenna-Repeater System if determined by testing after bid according to Section 27 00 00.

END OF SECTION

PART 1 GENERAL

1.01 GENERAL:

- A Each bidder shall submit a cost for the following described alternates in the space provided on the Bid Form. The work under the alternates shall conform to all applicable provisions of the drawings and specifications, except as specifically noted otherwise. The amounts quoted for alternates shall include the cost of all incidental omissions, additions, adjustments required because of each change, and the modification and/or removal of existing items as necessary for the new work. All items not specifically identified as alternate items shall be included in the Base Bid.

1.02 ADD ALTERNATE 1:

- A If Alternate 1 is accepted, the Contractor shall provide material, equipment, labor, and supervision necessary to replace existing casework in Classrooms #216 and 217; and repaint the walls in same classrooms, as shown on the drawings as Alternate 1.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

- A This Section includes administrative and procedural requirements for submittal and approval of substitutions.

1.02 RELATED DOCUMENTS

- A Applicable provisions of the General Conditions, Supplementary Conditions, and other Division 1, General Requirements, apply to the work under this section.

1.03 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.04 SUBMITTALS

- A. Substitution Requests: Submit a PDF of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use form provided in the Project Manual.
 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. 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.
 - i. Operational efficiency and energy consumption for equipment and appliances.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations if requested, for completed projects with project names and addresses and 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. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with

- related materials, and is appropriate for applications indicated.
1. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
 3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
 - a. Forms of Acceptance: 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.

1.05 QUALITY ASSURANCE

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

1.06 PROCEDURES

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

PART 2 PRODUCTS

2.01 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than fifteen (15) days prior to time required for preparation and review of related submittals.
 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 10 days prior to the date of the Bid. 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 if applicable.
- 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

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
 - 2. Section 01 21 00 - Allowances: For procedural requirements governing the handling and processing of allowances.
 - 3. Section 01 32 00 - Construction Progress Documentation: For administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.02 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.

1.03 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 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 seven days before the date scheduled for submittal of initial Applications for Payment.
 - 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
 - 4. 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.
 - 5. Subschedules for Separate Design Contracts: Where the Owner has retained design professionals under separate contracts who will each provide certification of payment requests, provide subschedules showing values coordinated with the scope of each design services contract, as described in Section 01 10 00 - Summary.
- 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. Architect's Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange schedule of values consistent with format of AIA Document G703.
 - 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - 4. 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.
 - 5. 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.
 - 6. 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.

7. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.
8. Overhead Costs: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
9. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
10. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.04 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.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the last day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.
- D. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
 1. Other Application for Payment forms proposed by the Contractor shall be acceptable to Architect and Owner. Submit forms for approval with initial submittal of schedule of values.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts 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 and signed, or authorized, before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- F. 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.
- G. Transmittal: Submit a PDF of each Application for Payment to Architect by email. 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.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien 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.
- I. 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. Products list (preliminary if not final).
 6. Sustainable design action plans, including preliminary project materials cost data.
 7. Schedule of unit prices.
 8. Submittal schedule (preliminary if not final).
 9. List of Contractor's staff assignments.
 10. List of Contractor's principal consultants.
 11. Copies of building permits.
 12. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 13. Initial progress report.
 14. Report of preconstruction conference.
 15. Certificates of insurance and insurance policies.
 16. Performance and payment bonds.
 17. Data needed to acquire Owner's insurance.
- J. 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.
- K. 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.
 5. AIA Document G706A.
 6. AIA Document G707.
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final liquidated damages settlement statement.

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SECTION 01 29 00
PAYMENT PROCEDURES

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General administrative requirements.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Construction progress schedule.
- E. Contractor's daily reports.
- F. Progress photographs.
- G. Submittals for review, information, and project closeout.
- H. Number of copies of submittals.
- I. Requests for Information (RFI) procedures.
- J. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 00 72 00 - General Conditions: Dates for applications for payment.
- B. Section 01 32 00 - Construction Progress Documentation: Form, content, and administration of schedules.
- C. Section 01 60 00 - Product Requirements: General product requirements.
- D. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.
- E. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 REFERENCE STANDARDS

- A. AIA G716 - Request for Information.
- B. AIA G810 - Transmittal Letter.
- C. CSI/CSC Form 12.1A - Submittal Transmittal; Current Edition.
- D. CSI/CSC Form 13.2A - Request for Interpretation; Current Edition.

1.04 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
- B. Make the following types of submittals to MBI Companies:
 - 1. Requests for Information (RFI).
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Coordination drawings.
 - 10. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

- A. MBI Companies will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. Owner.
 - 2. MBI Companies.
 - 3. Contractor.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 - 5. Submission of initial Submittal schedule.
 - 6. Designation of personnel representing the parties to Contract and MBI Companies.
 - 7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 8. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to MBI Companies, Owner, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.
- B. Attendance Required:
 - 1. Contractor.
 - 2. Owner.
 - 3. MBI Companies.
- C. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems that impede, or will impede, planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of RFIs log and status of responses.
 - 7. Review of off-site fabrication and delivery schedules.
 - 8. Maintenance of progress schedule.
 - 9. Corrective measures to regain projected schedules.
 - 10. Planned progress during succeeding work period.
 - 11. Coordination of projected progress.
 - 12. Maintenance of quality and work standards.
 - 13. Effect of proposed changes on progress schedule and coordination.
 - 14. Other business relating to work.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to MBI Companies, Owner, participants, and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE

- A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- C. Within 10 days after joint review, submit complete schedule.
- D. Submit updated schedule with each Application for Payment.

3.04 DAILY CONSTRUCTION REPORTS

- A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.
- B. In addition to transmitting electronically a copy to Owner and MBI Companies, submit two printed copies at weekly intervals.
 1. Submit in format acceptable to Owner.
- C. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
 1. Date.
 2. High and low temperatures, and general weather conditions.
 3. Safety, environmental, or industrial relations incidents.
 4. Meetings and significant decisions.
 5. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor's most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
 6. Testing and/or inspections performed.
 7. Signature of Contractor's authorized representative.

3.05 PROGRESS PHOTOGRAPHS

- A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.
- B. Photography Type: Digital; electronic files.
- C. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to MBI Companies.
- D. In addition to periodic, recurring views, take photographs of each of the following events:
- E. Views:
 1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
 2. Consult with MBI Companies for instructions on views required.
 3. Provide factual presentation.
 4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.
- F. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
 1. Delivery Medium: Via email.
 2. File Naming: Include project identification, date and time of view, and view identification.
 3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

3.06 REQUESTS FOR INFORMATION (RFI)

- A. Definition: A request seeking one of the following:
 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.

2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subs and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 2. Prepare using an electronic version of the form appended to this section.
 3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
 1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions (see Section - 01 60 00 - Product Requirements)
 - c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
 - d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
 3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
 4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
 - a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the MBI Companies, and any of its consultants, due to processing of such RFIs.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
 1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 2. Owner's, MBI Companies', and Contractor's names.
 3. Discrete and consecutive RFI number, and descriptive subject/title.
 4. Issue date, and requested reply date.
 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
 1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 2. Note dates of when each request is made, and when a response is received.
 3. Highlight items requiring priority or expedited response.
 4. Highlight items for which a timely response has not been received to date.

5. Identify and include improper or frivolous RFIs.

- H. Review Time: MBI Companies will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
 3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
 4. Notify MBI Companies within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.07 SUBMITTAL SCHEDULE

- A. Submit to MBI Companies for review a schedule for submittals in tabular format.
1. Submit at the same time as the preliminary schedule specified in Section - 01 32 16 - Construction Progress Schedule.
 2. Coordinate with Contractor's construction schedule and schedule of values.
 3. Format schedule to allow tracking of status of submittals throughout duration of construction.
 4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
 5. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
 - a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.08 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
1. Product data.
 2. Shop drawings.
 3. Samples for selection.
 4. Samples for verification.
- B. Submit to MBI Companies for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.09 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
1. Design data.
 2. Certificates.
 3. Test reports.
 4. Inspection reports.

5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for MBI Companies' knowledge as contract administrator or for Owner.

3.10 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:

1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.11 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by MBI Companies.

1. After review, produce duplicates.
2. Retained samples will not be returned to Contractor unless specifically so stated.

3.12 SUBMITTAL PROCEDURES

A. General Requirements:

1. Use a separate transmittal for each item.
2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
3. Transmit using approved form.
4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
 - a. Deliver submittals to MBI Companies at business address.
8. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
 - b. For sequential reviews involving MBI Companies' consultants, Owner, or another affected party, allow an additional 7 days.
 - c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to MBI Companies' approval, allow an additional 30 days.
9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.

10. Provide space for Contractor and MBI Companies review stamps.
11. When revised for resubmission, identify all changes made since previous submission.
12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
13. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
14. Submittals not requested will not be recognized or processed.
15. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architect's approval of submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submission and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for error or omissions in the submittals by the Architect's approval thereof.

B. Product Data Procedures:

1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Submit concurrently with related shop drawing submittal.
4. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:

1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
2. Do not reproduce Contract Documents to create shop drawings.
3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:

1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
3. Include with transmittal high-resolution image files of samples to facilitate electronic review and approval. Provide separate submittal page for each item image.

3.13 SUBMITTAL REVIEW

- A. Submittals for Review: MBI Companies will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: MBI Companies will acknowledge receipt and review. See below for actions to be taken.
- C. MBI Companies' actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
- D. MBI Companies' and consultants' actions on items submitted for review:
 1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. "Approved", or language with same legal meaning.
 - b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
 - 1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
 - c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
 - 1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
 - 2) Non-responsive resubmittals may be rejected.
 2. Not Authorizing fabrication, delivery, and installation:
 - a. "Revise and Resubmit".
 - 1) Resubmit revised item, with review notations acknowledged and incorporated.
 - 2) Non-responsive resubmittals may be rejected.
 - b. "Rejected".
 - 1) Submit item complying with requirements of Contract Documents.

- E. MBI Companies' and consultants' actions on items submitted for information:
 - 1. Items for which no action was taken:
 - a. "Received" - to notify the Contractor that the submittal has been received for record only.
 - 2. Items for which action was taken:
 - a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
1. General coordination procedures.
 2. Coordination drawings.
 3. RFIs.
 4. Digital project management procedures.
 5. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
 2. Section 01 32 00 - Construction Progress Documentation: For preparing and submitting Contractor's construction schedule.
 3. Section 01 70 00 – Execution and Closeout Requirements: For procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.02 DEFINITIONS

- A. BIM: Building Information Modeling.
- B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.03 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, telephone number, and email address 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 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. Post copies of list in project meeting room, in temporary field office, in web-based Project software directory, and in prominent location in built facility. Keep list current at all times.

1.04 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. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its own operations with operations included in different Sections that depend on each other for proper installation, connection, and operation.
1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. 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.
- D. 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. Preinstallation conferences.
 7. Project closeout activities.
 8. Startup and adjustment of systems.

1.05 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
- B. Coordination Drawing Organization: Organize coordination drawings as follows:
1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted

- devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
 3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
 4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
 5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
 6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
 7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator, and motor-control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
 8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
 9. Review: Architect will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
 10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01 30 00 – Administrative Requirements.

1.06 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 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: Form bound in Project Manual.
1. Attachments shall be electronic files in 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 by Architect 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.
 - 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 weekly. 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.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
- 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.

1.07 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Architect's Digital Data Files: Digital data files of Architect's BIM model may be provided by Architect for Contractor's use during construction.
1. Digital data files may be used by Contractor in preparing coordination drawings, Shop Drawings, and Project record Drawings.
 2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
 3. Digital Drawing Software Program: Contract Drawings are available in current version of Revit.
 4. Contractor shall execute a data licensing agreement in the form of MBI Companies' Electronic Release Form included in this Project Manual.
 - a. Subcontractors, and other parties granted access by Contractor to Architect's digital data files shall execute a data licensing agreement in the form of MBI Companies' Electronic Release Form included in this Project Manual.

- B. Web-Based Project Software: Provide, administer, and use web-based Project software site for purposes of hosting and managing Project communication and documentation until Final Completion.
1. Web-based Project software site includes, at a minimum, the following features:
 - a. Compilation of Project data, including Contractor, subcontractors, Architect, architect's consultants, Owner, and other entities involved in Project. Include names of individuals and contact information.
 - b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
 - c. Document workflow planning, allowing customization of workflow between project entities.
 - d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
 - e. Track status of each Project communication in real time, and log time and date when responses are provided.
 - f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
 - g. Processing and tracking of payment applications.
 - h. Processing and tracking of contract modifications.
 - i. Creating and distributing meeting minutes.
 - j. Document management for Drawings, Specifications, and coordination drawings, including revision control.
 - k. Management of construction progress photographs.
 - l. Mobile device compatibility, including smartphones and tablets.
 2. Provide web-based Project software user licenses for use of Owner, Architect, and Architect's consultants. Provide software training at Architect's office for web-based Project software users.
 3. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.
 4. Provide [one of]the following web-based Project software packages under their current published licensing agreements:
 - a. Autodesk; Buzzsaw or Constructware.
 - b. Corecon Technologies, Inc.
 - c. Meridian Systems; Prolog.
 - d. Newforma, Inc.
 - e. Procure Technologies, Inc.
 - f. Smartsheet, Inc.
 - g. Viewpoint, Inc.; Viewpoint for Project Collaboration.
- C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
1. Assemble complete submittal package into a single bookmarked file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.08 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 a minimum of 10 working days prior to meeting.
 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. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Phasing.
 - d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Use of web-based Project software.
 - h. Procedures for processing field decisions and Change Orders.
 - i. Procedures for RFIs.
 - j. Procedures for testing and inspecting.
 - k. Procedures for processing Applications for Payment.
 - l. Distribution of the Contract Documents.
 - m. Submittal procedures.
 - n. Sustainable design requirements.
 - o. Preparation of Record Documents.
 - p. Use of the premises and existing building.
 - q. Work restrictions.
 - r. Working hours.
 - s. Owner's occupancy requirements.
 - t. Responsibility for temporary facilities and controls.
 - u. Procedures for moisture and mold control.
 - v. Procedures for disruptions and shutdowns.
 - w. Construction waste management and recycling.
 - x. Parking availability.
 - y. Office, work, and storage areas.
 - z. Equipment deliveries and priorities.
 - aa. First aid.
 - bb. Security.
 - cc. Progress cleaning.
 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.

- o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. Protection of construction and personnel.
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. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.
- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Procedures for completing and archiving web-based Project software site data files.
 - d. Submittal of written warranties.
 - e. Requirements for completing sustainable design documentation.
 - f. Requirements for preparing operations and maintenance data.
 - g. Requirements for delivery of material samples, attic stock, and spare parts.
 - h. Requirements for demonstration and training.
 - i. Preparation of Contractor's punch list.
 - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - k. Submittal procedures.
 - l. Coordination of separate contracts.
 - m. Owner's partial occupancy requirements.
 - n. Installation of Owner's furniture, fixtures, and equipment.
 - o. Responsibility for removing temporary facilities and controls.
 - 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Conduct progress meetings at biweekly intervals.
- 1. Coordinate dates of meetings with preparation of payment requests.
 - 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the 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) Interface requirements.

2) Sequence of operations.

3) Resolution of BIM component conflicts.

4) Status of submittals.

5) Status of sustainable design documentation.

6) Deliveries.

7) Off-site fabrication.

8) Access.

9) Site use.

10) Temporary facilities and controls.

11) Progress cleaning.

12) Quality and work standards.

13) Status of correction of deficient items.

14) Field observations.

15) Status of RFIs.

16) Status of Proposal Requests.

17) Pending changes.

18) Status of Change Orders.

19) Pending claims and disputes.

20) Documentation of information for payment requests.

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.

F. Coordination Meetings: Conduct Project coordination meetings at biweekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

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

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

a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined 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.

b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

c. Review present and future needs of each contractor present, including the following:

1) Interface requirements.

2) Sequence of operations.

3) Resolution of BIM component conflicts.

4) Status of submittals.

5) Deliveries.

6) Off-site fabrication.

- 7) Access.
 - 8) Site use.
 - 9) Temporary facilities and controls.
 - 10) Work hours.
 - 11) Hazards and risks.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Status of RFIs.
 - 15) Proposal Requests.
 - 16) Change Orders.
 - 17) Pending changes.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

PART 1 GENERAL

1.01 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. Daily construction reports.
 5. Material location reports.
 6. Site condition reports.
 7. Unusual event reports.
- B. Related Requirements:
1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.02 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 completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.
- 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 completing an activity as scheduled.

1.03 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
1. Working electronic copy of schedule file, where indicated.
 2. PDF file.
- B. Startup construction schedule.

1. Submittal 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 digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
 - 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 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 each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
 3. Total Float Report: List of activities sorted in ascending order of total float.
 4. Earnings Report: Compilation of Contractor's total earnings from the Notice to Proceed until most recent Application for Payment.
 - F. Construction Schedule Updating Reports: Submit with Applications for Payment.
 - G. Daily Construction Reports: Submit at monthly intervals.
 - H. Material Location Reports: Submit at monthly intervals.
 - I. Site Condition Reports: Submit at time of discovery of differing conditions.
 - J. Unusual Event Reports: Submit at time of unusual event.
 - K. Qualification Data: For scheduling consultant.
- 1.04 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.
 - B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 - Project Management and Coordination. Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 1. Review software limitations and content and format for reports.
 2. Verify availability of qualified personnel needed to develop and update schedule.
 3. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial Owner occupancy.
 4. Review delivery dates for Owner-furnished products.
 5. Review schedule for work of Owner's separate contracts.
 6. Review submittal requirements and procedures.
 7. Review time required for review of submittals and resubmittals.
 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
 9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
 10. Review and finalize list of construction activities to be included in schedule.
 11. Review procedures for updating schedule.

1.05 COORDINATION

- A. 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.

1.06 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
- ~~1.~~ Use [Microsoft Project,] [Primavera,] [Meridian Prolog,] [Scheduling component of Project website software specified in Section 01 31 00 - Project Management and Coordination, or other approved software.
- B. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
1. In-House Option: Owner may waive 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.
- C. Time Frame: Extend schedule from date established for the Notice of Award to date of Substantial 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.
- D. Activities: Treat each floor 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 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 01 33 00 - Submittal Procedures in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 3. Startup and Testing Time: Include days for startup and testing.
 4. Commissioning Time: Include days for commissioning.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 6. Punch List and Final Completion: Include days for completion of punch list items and final completion.
- E. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in the schedule and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase.
 2. Work under More Than One Contract: Include a separate activity for each contract.
 3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
 4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 - Summary. Delivery dates indicated stipulate the earliest possible delivery date.
 5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 - Summary. Delivery dates indicated stipulate the earliest possible delivery date.
 6. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use-of-premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.

- h. Environmental control.
 - 7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Building flush-out.
 - m. Startup and placement into final use and operation.
 - n. Commissioning.
 - 8. 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. Structural completion.
 - b. Temporary enclosure and space conditioning.
 - c. Permanent space enclosure.
 - d. Completion of mechanical installation.
 - e. Completion of electrical installation.
 - f. Substantial Completion.
 - 9. Other Constraints: <Insert constraints not indicated elsewhere>.
- F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, final completion, and other important milestones:
- G. 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 01 29 00 - Payment Procedures: For cost reporting and payment procedures.
- H. 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 the Contract Time.
- I. 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.
- J. 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, equipment required to achieve compliance, and date by which recovery will be accomplished.

- K. 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.

1.07 STARTUP CONSTRUCTION SCHEDULE

- A. Gantt-Chart Schedule: Submit startup, horizontal, Gantt-chart-type construction schedule within seven days of date established for the Notice of Award.
- 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.

1.08 GANTT-CHART SCHEDULE REQUIREMENTS

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for the Notice to Proceed.
 - 1. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1.09 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.
 - 3. Approximate count of personnel at Project site.
 - 4. Equipment at Project site.
 - 5. Material deliveries.
 - 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 - 7. Testing and inspection.
 - 8. Accidents.
 - 9. Meetings and significant decisions.
 - 10. Unusual events.
 - 11. Stoppages, delays, shortages, and losses.
 - 12. Meter readings and similar recordings.
 - 13. Emergency procedures.
 - 14. Orders and requests of authorities having jurisdiction.
 - 15. Change Orders received and implemented.
 - 16. Construction/Work Change Directives received and implemented.
 - 17. Services connected and disconnected.
 - 18. Equipment or system tests and startups.
 - 19. Partial completions and occupancies.
 - 20. Substantial Completions authorized.
- B. 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.
- C. Unusual Event Reports: 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,

responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Submit unusual event reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

PART I GENERAL

1.01 DESCRIPTION:

- A. Work Included: Prepare and submit request for extensions of Time based on weather conditions.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not limited to General Conditions, Supplementary General Conditions and Sections in Division 1 of these Specifications.
 - 2. Applications for Payment.

1.02 EXTENSIONS OF CONTRACT TIME:

- A. If the basis exists for an extension of Time in accordance with the General Conditions and Supplementary General Conditions, an extension of time on the basis of weather may be granted only for the number of Weather Delay Days in excess of the number of days listed in the standard Baseline for that month.

1.03 STANDARD BASELINE FOR AVERAGE CLIMATIC RANGE:

- A. The State of Tennessee has reviewed weather data available from the National Oceanic and Atmospheric Administration and determined a Standard Baseline of average climatic range for the State of Tennessee.
- B. Standard Baseline shall be regarded as the normal and anticipatable number of calendar days for each month during which construction activity shall be expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days each month as listed in the Standard Baseline is included in the Work and is not eligible for extension of Contract Time.
- C. Standard Baseline for each month of the year is as follows (the anticipatable delay days follow the month):

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	11	8	7	7	6	7	5	4	5	6	11

1.04 ADVERSE WEATHER AND WEATHER DELAY DAYS:

- A. Adverse Weather is defined as the occurrence of one or more of the following conditions, substantiated by NOAA data, which prevents exterior construction activity or access to the site within twenty four (24)hours:
 - 1. Precipitation threshold (rain, snow, or ice) in excess of one-tenth inch (0.10") liquid measure. Snow to liquid measure ration is 10:1.
 - 2. Standing snow is excess of one inch (1.00").
- B. Additional extension of Time may be granted for drying days following periods of two or more consecutive days of precipitation for the following conditions:
 - 1. At a rate of one day extension of Time for each period of two or more consecutive days of precipitation of 1.0 inch or more (liquid measure).
 - 2. Only if there is a hindrance to site access or site work, such as excavation, backfill and footings and the like and then only when no such work is performed.
- C. A Weather Delay Day may be counted only if adverse weather prevents work on the Project for fifty percent (50%) or more of the contractor's scheduled, critical path work, including a weekend day or holiday if Contractor has scheduled construction activity that day.

1.05 DOCUMENTATION AND SUBMITTALS:

- A. Contractor shall submit on a monthly basis daily job site work logs (daily reports) showing which, and to what extent, construction activities have been adversely affected by weather.
- B. Submit actual weather data, if requested by Architect to support claim for time extension, as obtained from NOAA weather reporting station nearest the project site.
- C. Use Standard Baseline data provided in this Section when documenting actual delays due to weather in excess of the average climatic range.
- D. Organize claim and documentation to facilitate evaluation of a basis of calendar month periods, and submit in accordance with the procedures for Claims established in the General Conditions.
- E. Extensions of Time requested by the Contractor and approved by the Architect on the basis of conditions stated above shall be acknowledged and communicated in writing to the Contractor periodically.
- F. For extensions of Contract Time granted, a modification shall be issued in accordance with the provisions of the General Conditions, and the applicable General requirements. Modifications for extensions of Time may be issued quarterly or held to the end of the Project as appropriate based on Architect's approval of such extensions as noted in E above.
- G. Extensions of Time not requested in a timely manner by the Contractor will not be granted at a later time.

PART II PRODUCTS - NOT USED

PART III EXECUTION - NOT USED

END OF SECTION

Submittal Cover Sheet

Submittal No.: _____

Contractor: _____

Date: _____

Phone: _____

Fax: _____

Project Manager: _____

Email: _____

Project Title: _____

Architect's Comm. No.: _____

Spec Section Title: _____

Section No.: _____

Sub / Supplier: _____

Phone: _____

YES NO

Product is as Specified

If not as specified attach Substitution Request Form

Contractor's Review Stamp

Remarks: _____

PART 1 GENERAL

1.01 PROGRESS SCHEDULE

- A. In addition to the progress schedule required by the General Conditions, the Contractor shall also submit his proposed scheme of work for approval, describing proposed methods and sequences of work from beginning to completion of the work and their correlation with the Owner's requirements.
- B. When the Contractor's proposed sequence of work has been approved by the Owner, it shall become the time schedule for the work and shall be adhered to as closely as possible by both the Contractor and the Owner, except that mutually agreeable modifications may be made from time to time to meet unforeseen exigencies.

1.02 TIME OF PERFORMING WORK

- A. Generally, the Contractor will be permitted to conduct his work in the building and on the premises during his regular working hours.
- B. The building must have the HVAC system operational and maintained at a constant temperature prior to installing any building finishes, except metal support systems.

1.03 OBSTRUCTIONS

- A. All obstructions encountered during the construction of the Contract work shall be overcome by the Contractor by removal or alteration of work in place, by adjustments in the new work, or by temporary removal and reinstallation of existing work.

1.04 CLEANING UP

- A. 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.
- B. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- C. Exposed Surfaces in Finished Areas: Clean exposed surfaces
- D. Upon completion of the work, remove spots, stains, dirt, and dust from finished surfaces, both new and existing, including the surfaces of all existing machinery, equipment, and exposed piping that have been soiled by the construction. Protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- E. Clean and mop hard surface flooring and resilient flooring and vacuum clean carpet flooring
- F. Wash all glass and clean plumbing fixtures, lighting fixtures, and mechanical equipment.
- G. Comply with all special cleaning instructions contained in the various other sections of the specifications.
- H. Protect new and existing surfaces from the growth and spread of mold and mildew. If mold and mildew occur, notify Architect prior to proceeding. Retain qualified testing agency to document and direct remediation. Remediate or replace surfaces to stop the growth and spread of mold and mildew as deemed necessary by a qualified testing agency acceptable to the Contractor, Owner and Architect.
 - 1. Pay for necessary testing and perform all abatement work required to remedy condition.

1.05 INSPECTION OF WORK IN PLACE

- A. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities. The architect is to be given advanced notification for inspection of Structural, Mechanical, Plumbing, and Electrical work prior to said work being covered.
- B. Contractor shall give architect advanced notification for final inspection punch list prior to Owner occupying space.

1.06 SMOKING AND FIRE PRECAUTIONS

- A. No fire, or use of any fire, or explosion-producing tools or equipment will be permitted on the property
- B. This facility is a designated non-smoking facility. Smoking will not be permitted in the facility or within 50 feet of any entrance.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY OF REFERENCE STANDARDS

- A. Regulatory requirements applicable to this project are the following:
- B. 28 CFR 35 - Nondiscrimination on the Basis of Disability in State and Local Government Services; Final Rule; Department of Justice; current edition.
- C. 28 CFR 36 - Nondiscrimination by Public Accommodations and in Commercial Facilities; Final Rule; Department of Justice; current edition.
- D. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- E. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- F. 29 CFR 1910 - Occupational Safety and Health Standards; current edition.
- G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- H. ICC (IFC) - International Fire Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- I. NFPA 1 - Fire Code; 2018.
- J. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- L. NFPA 5000 - Building Construction and Safety Code; 2018.
- M. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- N. ICC (IMC) - International Mechanical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- O. ICC (IFGC) - International Fuel Gas Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- P. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.02 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements.

1.03 QUALITY ASSURANCE

- A. Contractor's Designer Qualifications: Refer to Section - 01 40 00 - Quality Requirements.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

PART 1 GENERAL

1.01 Quality Control is defined as testing and inspection performed by/or under the direction of the Contractor to ensure materials and construction meet the requirements of the Contract Documents and Specifications.

1.02 TESTS

A. Engage inspection and test service agencies, including independent testing laboratories, which comply with "Guidelines for Effective Practice for Materials Engineering Laboratories" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.

B. Tests required to establish compliance with the Contract requirements for quality control shall be made by a testing agency acceptable to the Contractor, the Owner, and the Architect with reports certified by the laboratory and furnished in duplicate to the Architect with a copy to the Contractor.

C. Representatives of the testing agency and monitoring shall have access to the work at all times. The Contractor shall provide facilities for such access and samples as necessary so that the testing agency may properly perform its function.

D. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to the following:

Name of testing agency or testing laboratory.

Dates and locations of samples and test or inspections.

Names of individuals making the inspection or test.

Complete inspection or test data.

Test results

Interpretations of test results.

Notation of significant ambient conditions at the time of sample taking and testing.

Comments or professional opinion as to whether inspected or tested work complies with requirements of the contract documents.

Recommendations on retesting, if applicable.

E. Non-Compliant Inspection/Test Results: Within 24 hours of inspection/test being performed, notify Architect/Engineer-of-Record, and the Contractor of any non-conforming/non-compliant inspections/tests. Copies of successful retests of the originally non-conforming/non-compliant work shall be submitted to the Architect/Engineer-Of-Record and the Contractor.

F. Project Closeout: Contractor shall certify to the Architect of Record that the required quality control services, as required by this section and the contract documents have been performed and that all results indicate compliance with requirements.

1.03 COST OF TESTS

A. The cost of the services of the testing agency and monitoring shall be paid by the Contractor. When the tests indicate noncompliance with the Contract requirements, any subsequent retesting occasioned by noncompliance shall be performed by the same testing agency and the costs shall be paid by the Contractor.

1.04 NOTIFICATIONS OF THE ARCHITECT

A. Notify architect within 24 hours before any work is completed for areas as described herein. If the architect is not notified as stated above and the Contractor proceeds with the work, the Architect shall have authority to direct the Contractor to remove part or all installed materials at the Contractor's expense for a detailed observation.

B. The Architect shall be notified at the following points of work:

1. Footing bottoms and concrete reinforcement prior to pouring any concrete.

2. Waterproofing/Damp-proofing prior to any backfilling work.
 3. Water drainage test on sloped concrete floors prior to finish floor materials installed.
 4. Thru-wall flashing installation and mortar mix prior to installing any masonry.
 5. Completed structural steel erection before floor slabs are poured.
 6. Mechanical and Electrical systems above ceiling inspection prior to installation of finish ceiling material.
- C. The respective contractor and/or subcontractor shall correct any deficiencies that may be observed. Construction work observations or lack there of by the architect does not relieve the contractor and/or subcontractor from any liability of faulty workmanship that may have occurred or may occur at a later date.

1.05 OTHER TESTS

- A. See provisions of the General Conditions regarding tests required by governing authorities.
- B. The provisions of Divisions 22, 23 and 26 for tests required for plumbing, mechanical, and electrical work.

PART 2 PRODUCTS – (NOT USED)

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION

- A. Upon completion of inspection, testing, sample taking, and similar services, repair damaged work and restore substrates and finishes to eliminate all deficiencies. Repair and protection are the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Code-required special inspections.
- B. Testing services incidental to special inspections.
- C. Submittals.
- D. Manufacturers' field services.
- E. Fabricators' field services.

1.02 RELATED REQUIREMENTS

- A. Document 00 72 00 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 21 00 - Allowances: Allowance for payment of testing services.
- C. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- D. Section 01 40 00 - Quality Requirements.
- E. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

1.03 ABBREVIATIONS AND ACRONYMS

- A. AHJ: Authority having jurisdiction.
- B. IAS: International Accreditation Service, Inc.
- C. NIST: National Institute of Standards and Technology.

1.04 DEFINITIONS

- A. Code or Building Code: See Contract Documents and drawings for applicable code for this project.
- B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.
- C. Special Inspection:
 - 1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Contract Documents and the referenced standards.
 - 2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

1.05 REFERENCE STANDARDS

- A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary
- B. AISC 341 - Seismic Provisions for Structural Steel Buildings
- C. AISC 360 - Specification for Structural Steel Buildings
- D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- F. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
- G. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field

- H. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete
- I. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
- J. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
- K. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing
- L. ASTM E605/E605M - Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members
- M. ASTM E736/E736M - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
- N. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestops
- O. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers
- P. ASTM E2570/E2570M - Standard Test Methods for Evaluating Water-Resistive Barrier (WRB) Coatings Used under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage
- Q. AWCI 117 - Technical Manual 12-B; Standard Practice for the Testing and Inspection of Field Applied Thin Film Intumescent Fire-Resistive Materials; an Annotated Guide
- R. AWS D1.1/D1.1M - Structural Welding Code - Steel
- S. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel
- T. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel
- U. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- V. SDI (QA/QC) - Standard for Quality Control and Quality Assurance for Installation of Steel Deck
- W. SJI 100 - Catalog of Standard Specifications Load Tables and Weight Tables for Steel Joists and Joist Girders
- X. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
 - 1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 - 3. Submit certification that Special Inspection Agency is acceptable to AHJ.
- C. Testing Agency Qualifications: Prior to the start of work, the Testing Agency is required to:
 - 1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 - 3. Submit certification that Testing Agency is acceptable to AHJ.

- D. Smoke Control Testing Agency Qualifications: Prior to the start of work, the Testing Agency is required to:
1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 2. Submit documentary evidence that agency has appropriate credentials and documented experience in fire protection engineering, mechanical engineering and HVAC air balancing.
 3. Submit certification that Testing Agency is acceptable to AHJ.
- E. Manufacturer's Qualification Statement: Manufacturer is required to submit documentation of manufacturing capability and quality control procedures. Include documentation of AHJ approval.
- F. Fabricator's Qualification Statement: Fabricator is required to submit documentation of fabrication facilities and methods as well as quality control procedures. Include documentation of AHJ approval.
- G. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to MBI Companies and one to the AHJ.
1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of Special Inspector.
 - d. Date and time of special inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of special inspection.
 - h. Date of special inspection.
 - i. Results of special inspection.
 - j. Compliance with Contract Documents.
 2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.
- H. Fabricator Special Inspection Reports: After each special inspection of fabricated items at the Fabricator's facility, Special Inspector is required to promptly submit at least two copies of report; one to MBI Companies and one to AHJ.
1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of Special Inspector.
 - d. Date and time of special inspection.
 - e. Identification of fabricated item and specification section.
 - f. Location in the Project.
 - g. Results of special inspection.
 - h. Verification of fabrication and quality control procedures.
 - i. Compliance with Contract Documents.
 - j. Compliance with referenced standard(s).
- I. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to MBI Companies and one to AHJ.
1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test or inspection.
 - h. Date of test or inspection.

- i. Results of test or inspection.
 - j. Compliance with Contract Documents.
- J. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to MBI Companies and AHJ, in quantities specified for Product Data.
- 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to MBI Companies and AHJ.
- K. Manufacturer's Field Reports: Submit reports to MBI Companies and AHJ.
- 1. Submit report in duplicate within 30 days of observation to MBI Companies for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.
- L. Fabricator's Field Reports: Submit reports to MBI Companies and AHJ.
- 1. Submit report in duplicate within 30 days of observation to MBI Companies for information.
 - 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in Contract Documents.

1.07 SPECIAL INSPECTION AGENCY

- A. Owner or Owner's Agent will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by the building code.
- B. The Special Inspection Agency may employ and pay for services of an independent testing agency to perform testing and sampling associated with special inspections and required by the building code.
- C. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.08 TESTING AND INSPECTION AGENCIES

- A. Owner or Owner's Agent may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.
- B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.09 QUALITY ASSURANCE

- A. Special Inspection Agency Qualifications:
 - 1. Independent firm specializing in performing testing and inspections of the type specified in this section.
- B. Testing Agency Qualifications:
 - 1. Independent firm specializing in performing testing and inspections of the type specified in this section.
- C. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

- A. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
 - 1. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.
 - 2. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.

THE FOLLOWING INFORMATION IS PROVIDED AS A SUPPLEMENT (BUT NOT AN EXHAUSTIVE LIST) TO THE SPECIAL INSPECTION REQUIREMENTS LISTED IN THE DRAWINGS. SPECIAL INSPECTIONS REQUIERD FOR THIS PROJET ARE LISTED IN THE DRAWINGS AND INFORMATION BELOW IS TO BE USED TO SUPPLEMENT ITEMS THAT ARE REQUIRED.

3.02 SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION

- A. Structural Steel: Comply with quality assurance inspection requirements of ICC (IBC).
- B. Cold-Formed Steel Deck: Comply with quality assurance inspection requirements of SDI (QA/QC).
- C. Open-Web Joists and Joist Girders: Comply with requirements of ICC (IBC), Table 1705.2.3.
 - 1. End Connections - Welding or Bolted: Comply with requirements of SJI 100; periodic.
 - 2. Bridging - Horizontal or Diagonal:
 - a. Standard Bridging: Comply with requirements of SJI 100; periodic.
 - b. Bridging That Differs From the SJI Specifications: Periodic inspection.
- D. Cold-Formed Steel Trusses Spanning 60 feet or Greater: Special Inspector is required to verify that the temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.

3.03 SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION

- A. Reinforcement, Including Prestressing Tendons, and Verification of Placement: Verify compliance with ACI 318, Chapters 20, 25.2, 25.3, 26.6.1-26.6.3; periodic.
- B. Reinforcing Steel, Including Prestressing of Tendons and Placement: Verify compliance with approved Contract Documents and ACI 318, Sections 3.5 and 7.1 through 7.7; periodic.
- C. Reinforcing Bar Welding: Verify compliance with AWS D1.4/D1.4M and ACI 318, 26.6.4; periodic.
 - 1. Verify weldability of reinforcing bars other than those complying with ASTM A706/A706M; periodic.
 - 2. Inspect single-pass fillet welds, maximum 5/16 inch; periodic.
 - 3. Inspect all other welds; continuous.
- D. Anchors Cast in Concrete: Verify compliance with ACI 318, 17.8.2; periodic.
- E. Bolts Installed in Concrete: Where allowable loads have been increased or where strength design is used, verify compliance with approved Contract Documents and ACI 318, Sections 8.1.3 and 21.2.8 prior to and during placement of concrete; continuous.
- F. Anchors Post-Installed in Hardened Concrete: Verify compliance with ACI 318.
 - 1. Adhesive Anchors: Verify horizontally or upwardly-inclined orientation installations resisting sustained tension loads - Section 17.8.2.4; continuous.
 - 2. Other Mechanical and Adhesive Anchors: Verify as per Chapter 17.8.2; periodic.
- G. Design Mix: Verify plastic concrete complies with the design mix in approved Contract Documents and with ACI 318, Chapter 19, 16.4.3, 26.4.4; periodic.
- H. Design Mix: Verify plastic concrete complies with the design mix in approved Contract Documents and with ACI 318, Chapter 4 and 5.2; periodic.
- I. Concrete Sampling Concurrent with Strength Test Sampling: Each time fresh concrete is sampled for strength tests, verify compliance with ASTM C172/C172M, ASTM C31/C31M and ACI 318, Chapter 26.5, 26.12, and record the following, continuous:
 - 1. Slump.
 - 2. Air content.
 - 3. Temperature of concrete.
- J. Concrete and Shotcrete Placement: Verify application techniques comply with approved Contract Documents and ACI 318, Chapter 26.5; continuous.
- K. Specified Curing Temperature and Techniques: Verify compliance with ACI 318, Chapter 26.5.3-26.5.5; periodic.

- L. Specified Curing Temperature and Techniques: Verify compliance with approved Contract Documents and ACI 318, Sections 5.11 through 5.13; periodic.
- M. Prestressed Concrete: Verify compliance with approved Contract Documents; continuous.
 - 1. Application of Prestressing Forces: Verify compliance with ACI 318, Chapter 26.10.
 - 2. Grouting of Bonded Prestressing Tendons: Verify compliance with ACI 318, Chapter 26.10.
- N. Precast Concrete Members: Verify erection techniques and placement comply with approved Contract Documents and ACI 318, Chapter 26.9; periodic.
- O. Concrete Strength in Situ: Verify concrete strength complies with approved Contract Documents and ACI 318, Chapter 26.11.2, for the following:
 - 1. Post-tensioned concrete, prior to stressing of tendons; periodic.
 - 2. Beams and structural slabs, prior to removal of shores and forms; periodic.
- P. Formwork Shape, Location and Dimensions: Verify compliance with approved Contract Documents and ACI 318, Chapter 26.11.1.2(b); periodic.
- Q. Welding of Reinforcing Bars: Conduct special inspections and verify Special Inspector's qualifications in accordance with requirements of AWS D1.4/D1.4M.
- R. Materials: If the Contractor cannot provide sufficient data or documentary evidence that concrete materials comply with the quality standards of ACI 318, the AHJ will require testing of materials in accordance with the appropriate standards and criteria in ACI 318, Chapters 19 and 20.

3.04 SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION

- A. Masonry Structures Subject to Special Inspection:
 - 1. Masonry construction when required by the quality assurance program of TMS 402/602.
 - 2. Empirically designed masonry, glass unit masonry and masonry veneer in structures designated as "essential facilities".
 - a. Perform inspections in accordance with Level B Quality Assurance.
 - 3. Engineered masonry in structures classified as "low hazard..." and "substantial hazard to human life in the event of failure".
- B. Verify each item below complies with approved Contract Documents and the applicable articles of TMS 402/602.
 - 1. Inspections and Approvals:
 - a. Verify compliance with the required inspection provisions of the approved Contract Documents; periodic.
 - b. Verify approval of submittals required by Contract Documents; periodic.
 - 2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction unless specifically exempted by code; periodic.
 - 3. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
 - 4. Joints and Accessories: When masonry construction begins, verify:
 - a. Proportions of site prepared mortar; periodic.
 - b. Construction of mortar joints; periodic.
 - c. Location of reinforcement, connectors, prestressing tendons, anchorages, etc; periodic.
 - d. Prestressing technique; periodic.
 - e. Grade and size of prestressing tendons and anchorages; periodic.
 - 5. Structural Elements, Joints, Anchors, Protection: During masonry construction, verify:
 - a. Size and location of structural elements; periodic.
 - b. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; periodic.
 - c. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
 - d. Welding of reinforcing bars; continuous.
 - e. Preparation, construction and protection of masonry against hot weather above 90 degrees F and cold weather below 40 degrees F; periodic.

- f. Application and measurement of prestressing force; continuous.
- 6. Grouting Preparation: Prior to grouting, verify:
 - a. Grout space is clean; periodic.
 - b. Correct placement of reinforcing, connectors, prestressing tendons and anchorages; periodic.
 - c. Correctly proportioned site prepared grouts and prestressing grout for bonded tendons; periodic.
 - d. Correctly constructed mortar joints; periodic.
- 7. Prestressing Bonded Tendons: Verify placement after grouting; continuous.
- 8. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; periodic.

C. Engineered Masonry in Buildings Designated as "Essential Facilities": Verify compliance of each item below with approved Contract Documents and the applicable articles of TMS 402/602.

- 1. Inspections and Approvals:
 - a. Verify compliance with the required inspection provisions of the approved Contract Documents; periodic.
 - b. Verify approval of submittals required by Contract Documents; periodic.
- 2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction and upon completion of each 5,000 square feet increment of masonry erected during construction; periodic.
- 3. Preblended Mortar and Grout: Verify proportions of materials upon delivery to site; periodic.
- 4. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
- 5. Engineered Elements, Joints, Anchors, Grouting, Protection: Verify compliance of each item below with approved Contract Documents and referenced standards.
 - a. Proportions of site prepared mortar; periodic.
 - b. Placement of masonry units and construction of mortar joints; periodic.
 - c. Placement of reinforcement, connectors, prestressing tendons, anchorages, etc.; periodic.
 - d. Grout space prior to grouting; continuous.
 - e. Placement of grout; continuous.
 - f. Placement of prestressing grout; continuous.
 - g. Size and location of structural elements; periodic.
 - h. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; continuous.
 - i. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
 - j. Welding of reinforcing bars; continuous.
 - k. Preparation, construction and protection of masonry against hot weather above 90 degrees F and cold weather below 40 degrees F; periodic.
 - l. Application and measurement of prestressing force; continuous.
- 6. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; continuous.

3.05 SPECIAL INSPECTIONS FOR PREFABRICATED AND SITE-BUILT WOOD CONSTRUCTION

- A. High Load Diaphragms: Verify compliance of each item below with approved Contract Documents.
 - 1. Grade and thickness of sheathing.
 - 2. Nominal size of framing members at adjacent panel edges.
 - 3. Nail or staple diameter and length.
 - 4. Number of fastener lines.
 - 5. Fastener spacing at lines and at edges.
- B. Metal Plate Connected Wood Trusses with Clear Span of 60 feet or More: Verify compliance of each item below with approved Contract Documents in general and with approved truss submittal package in particular.
 - 1. Temporary restraint and bracing.
 - 2. Permanent individual truss member restraint and bracing.

3.06 SPECIAL INSPECTIONS FOR SOILS

- A. Materials and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
 - 1. Design bearing capacity of material below shallow foundations; periodic.
 - 2. Design depth of excavations and suitability of material at bottom of excavations; periodic.
 - 3. Materials, densities, lift thicknesses; placement and compaction of backfill: continuous.
 - 4. Subgrade, prior to placement of compacted fill verify proper preparation; periodic.
- B. Testing: Classify and test excavated material; periodic.

3.07 SPECIAL INSPECTIONS FOR DRIVEN DEEP FOUNDATIONS

- A. Materials, Equipment and Final Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
 - 1. Material types, sizes and lengths; continuous.
 - 2. Capacities of test elements and additional load tests as required; continuous.
 - 3. Placement locations and plumbness; continuous.
 - 4. Type and size of hammer; continuous.
- B. Installation: Observe driving operations and maintain complete and accurate records for each element; continuous.
 - 1. Record number of blows per foot of penetration.
 - 2. Determine penetration required to achieve design capacity.
 - 3. Record tip and butt elevations.
 - 4. Document any damage to foundation element.
- C. Steel Components of Driven Deep Foundations: Perform additional inspections as required by the Special Inspections for Steel Construction article of this section.
- D. Concrete and Concrete Filled Components of Driven Deep Foundations: Perform additional inspections as required by the Special Inspections for Concrete Construction article of this section.
- E. Specialty Items Associated with Driven Deep Foundations: Conduct special inspections as directed by MBI Companies.

3.08 SPECIAL INSPECTIONS FOR CAST-IN-PLACE DEEP FOUNDATIONS

- A. Materials, Equipment and Final Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
 - 1. Element length; continuous.
 - 2. Element diameters and bell diameters; continuous.
 - 3. Embedment into bedrock; continuous.
 - 4. End bearing strata capacity; continuous.
 - 5. Placement locations and plumbness; continuous.
 - 6. Type and size of hammer; continuous.
- B. Drilling Operations: Observe and maintain complete and accurate records for each element; continuous.
- C. Material Volume: Record concrete and grout volumes.
- D. Concrete Elements Associated with Cast-in-Place Deep Foundations: Perform additional inspections as required by the Special Inspections for Concrete Construction article of this section.

3.09 SPECIAL INSPECTIONS FOR HELICAL PILE FOUNDATIONS

- A. Materials, Equipment and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
 - 1. Type and capacity of installation equipment used; continuous.
 - 2. Pile dimensions; continuous.
 - 3. Tip elevation; continuous.
 - 4. Final depth; continuous.

5. Final installation torque; continuous.
6. Other installation data requested in writing by MBI Companies; continuous.

3.10 SPECIAL INSPECTIONS FOR VERTICAL MASONRY FOUNDATION ELEMENTS

- A. Vertical Masonry Foundation Elements are subject to the same special inspection requirements listed in the "Special Inspections for Masonry Construction" Article of this section.

3.11 SPECIAL INSPECTIONS FOR SPRAYED FIRE RESISTANT MATERIALS

- A. Sprayed Fire Resistant Materials, General:
 1. Verify compliance of sprayed-fire resistant materials with specific fire-rated assemblies indicated in approved Contract Documents, and with applicable requirements of the building code.
 2. Perform special inspections after rough installation of electrical, mechanical, plumbing, automatic fire sprinkler and suspension systems for ceilings.
- B. Physical and visual tests: Verify compliance with fire resistance rating.
 1. Condition of substrates; periodic.
 2. Thickness of sprayed fire resistant material; periodic.
 3. Density of sprayed fire resistant material in pounds per cubic foot; periodic.
 4. Bond strength (adhesion and cohesion); periodic.
 5. Condition of finished application; periodic.
- C. Structural member surface conditions:
 1. Inspect structural member surfaces before application of sprayed fire resistant materials; periodic.
 2. Verify preparation of structural member surfaces complies with approved Contract Documents and manufacturer's written instructions; periodic.
- D. Application:
 1. Ensure minimum ambient temperature before and after application complies with the manufacturer's written instructions; periodic.
 2. Verify area where sprayed fire resistant material is applied is ventilated as required by the manufacturer's written instructions during and after application; periodic.
- E. Thickness: Verify that no more than 10 percent of thickness measurements taken from sprayed fire resistant material are less than thickness required by fire resistance design in approved Contract Documents. In no case shall the thickness of the sprayed fire resistant material be less than the minimum below.
 1. Minimum Allowable Thickness: Tested according to ASTM E605/E605M, periodic.
 - a. Design thickness 1 inch or greater: Design thickness minus 1/4 inch.
 - b. Design thickness greater than 1 inch: Design thickness minus 25 percent.
 2. Floor, Roof and Wall Assemblies: Test thickness according to ASTM E605/E605M with no less than four measurements per 1,000 square feet of sprayed area on each story of the structure or portion thereof; periodic.
 - a. Cellular Decks: Measure thickness within a single 12 inch by 12 inch area. Make a minimum of four measurements arranged symmetrically in testing area.
 - b. Fluted Decks: Measure thickness within a single 12 inch by 12 inch area. Make a minimum of four measurements arranged symmetrically in testing area and include one example each of valley, crest and sides. Report the average of the four measurements.
 3. Structural Members: Test according to ASTM E605/E605M. Test no less than 25 percent of structural members on each story of the structure or portion thereof; periodic.
 - a. Beams and girders: Make nine thickness measurements around beam or girder at each end of a 12 inch by 12 inch length.
 - b. Joists and trusses: Make seven thickness measurements around joist or truss at each end of a 12 inch by 12 inch length.
 - c. Wide flanged columns: Make twelve thickness measurements around column at each end of a 12 inch by 12 inch length.
 - d. Hollow structural sections and pipe columns: Make four thickness measurements around hollow structural section or pipe column at each end of a 12 inch by 12 inch length.

- F. Density: Verify density of sprayed fire resistant material is no less than density required by the fire resistance design in the approved Contract Documents.
 - 1. Floor, Roof and Wall Assemblies: Test according to ASTM E605/E605M with no less than one sample per 2,500 square feet of sprayed area on each story of the structure or portion thereof; periodic.
 - 2. Beams, Girders, Trusses and Columns: Test according to ASTM E605/E605M with no less than one sample per 2,500 square feet of sprayed area on each story of the structure or portion thereof; periodic.
 - G. Bond Strength: Verify adhesive and cohesive bond strength of sprayed fire resistant materials is no less than 150 pounds per square foot when in-place samples of the cured material are tested according to ASTM E736/E736M and as described below.
 - 1. Floor, roof and wall assemblies: Test no less than one sample per each 2,500 square feet of sprayed area on each story of the structure or portion thereof; periodic.
 - 2. Structural members: Test no less than one sample from each type of structural member in each 2,500 square feet of each story of the structure or portion thereof; periodic.
 - 3. Primer, paint and encapsulant bond tests: When sprayed fire resistant material is applied to a primed, painted or encapsulated surface for which acceptable material to substrate performance has not been determined, conduct bond test.
- 3.12 SPECIAL INSPECTIONS FOR MASTIC AND INTUMESCENT FIRE RESISTANT COATINGS
- A. Verify mastic and intumescent fire resistant coatings comply with AWCI 117 and the fire resistance rating indicated on approved Contract Documents.
- 3.13 SPECIAL INSPECTIONS FOR EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)
- A. Verify water resistive barrier coating applied over sheathing complies with ASTM E2570/E2570M.
- 3.14 SPECIAL INSPECTIONS FOR FIRE RESISTANT PENETRATIONS AND JOINTS
- A. Verify penetration firestops in accordance with ASTM E2174.
 - B. Verify fire resistant joints in accordance with ASTM E2393.
- 3.15 SPECIAL INSPECTIONS FOR SMOKE CONTROL
- A. Test smoke control systems as follows:
 - 1. Record device locations and test system for leakage after erection of ductwork but before starting construction that conceals or blocks access to system.
 - 2. Test and record pressure difference, flow measurements, detection function and controls after system is complete and before structure is occupied.
- 3.16 SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE
- A. Seismic Force-Resisting Systems: Comply with the quality assurance plan requirements of AISC 341.
 - B. Structural Steel: Comply with the quality assurance plan requirements of AISC 341.
 - C. Structural Wood:
 - 1. Field gluing; continuous.
 - 2. Nailing, bolting, anchoring and other fastening of components within the seismic force-resisting system; periodic.
 - D. Cold Formed Steel Light Frame Construction:
 - 1. Field welding; periodic.
 - 2. Screw attachment, bolting, anchoring and other fastening of components within the main seismic force-resisting system; periodic.
 - E. Storage Racks and Access Floors: Anchorage; periodic.
 - F. Architectural Components: Erection and fastening of components below; periodic.
 - 1. Exterior cladding.
 - 2. Interior and exterior veneer.

3. Interior and exterior non-loadbearing walls and partitions.

G. Mechanical and Electrical Components:

1. Anchorage of electric equipment required for emergency or standby power systems; periodic.
2. Installation and anchorage of other electrical equipment; periodic.
3. Installation of piping systems for flammable, combustible or highly-toxic contents and associated mechanical units; periodic.
4. Installation of HVAC ductwork that will contain hazardous materials; periodic.
5. Vibration isolation systems where the approved Contract Documents require a nominal clearance of 1/4 inch or less between support frame and seismic restraint; periodic.
6. Installation of mechanical and electrical equipment, including duct work, piping systems and their structural supports, where automatic fire sprinkler systems are installed.
 - a. Verify clearances have been provide as required by Section 13.2.3 of ASCE 7.
 - b. Verify nominal clearance of 3 inches has been provided between fire protection sprinkler drops and sprigs and: structural members not used collectively or independently to support the sprinklers; equipment attached to the building structure; and other systems' piping.

H. Seismic Isolation Systems:

1. Fabrication and installation of isolator units; periodic.
2. Fabrication and isolation of energy dissipation devices; periodic.

I. Cold-Formed Steel Special Bolted Moment Frames:

1. Installation in seismic force-resisting systems; periodic.

J. Designated Seismic System Verification: Verify label, anchorage or mounting complies with certificate of compliance provided by manufacturer or fabricator.

K. Structural Testing for Seismic Resistance:

1. Concrete reinforcement: Comply with ACI 318, Section 21.1.5.2.
 - a. Materials Obtain mill certificates demonstrating compliance with ASTM A615/A615M; periodic.
 - b. Welding: Perform chemical tests complying with ACI 318, Section 3.5.2 to determine weldability; periodic.
2. Structural Steel: Comply with the quality assurance requirements of AISC 341.
3. Non-Structural Components:
 - a. General Design Requirements: Obtain manufacturer certification of compliance with requirements of ASCE 7, Section 13.2.1; periodic.
 - b. Designated Seismic Force-Resisting Non-Structural System Components: Obtain manufacturer certification of compliance with ASCE 7, Section 13.2.2; periodic.
4. Seismically Isolated Structures: Test system in accordance with ASCE 7, Section 17.8.

L. Structural Observations for Seismic Resistance: Visually observe structural system for general compliance with the approved Contract Documents; periodic.

3.17 SPECIAL INSPECTIONS FOR WIND RESISTANCE

A. Structural Wood:

1. Field gluing of components in the main wind force-resisting system; continuous.
2. Nailing, bolting, anchoring and other fastening of components within the main wind force-resisting system; periodic.

B. Cold-Formed Steel Light Frame Construction:

1. Field welding; periodic.
2. Screw attachment, bolting, anchoring and other fastening of components within the main wind force-resisting system; periodic

C. Wind Resisting Components:

1. Roof covering, roof deck, and floor framing connections; periodic.
2. Exterior wall covering and wall connections to roof and floor diaphragms and framing; periodic.

- D. Structural Observations for Wind Resistance: Visually observe structural system for general compliance with the approved Contract Documents; periodic.

3.18 STRUCTURAL OBSERVATIONS FOR STRUCTURES

- A. Provide Observations: For structure where one or more of the following conditions exist:
 - 1. The structure is classified as Risk Category IV.
 - 2. The structure is a high-rise building.
 - 3. Such observation is required by the registered design professional responsible for the structural design.
 - 4. Such observation is specifically required by AHJ.

3.19 OTHER SPECIAL INSPECTIONS

- A. Provide for special inspection of work that, in the opinion of the AHJ, is unusual in nature.
- B. For the purposes of this section, work unusual in nature includes, but is not limited to:
 - 1. Construction materials and systems that are alternatives to materials and systems prescribed by the building code.
 - 2. Unusual design applications of materials described in the building code.
 - 3. Materials and systems required to be installed in accordance with the manufacturer's instructions when said instructions prescribe requirements not included in the building code or in standards referenced by the building code.
- C. Alternative Test Procedures: Where approved rules and standards do not exist, test materials and assemblies as required by AHJ or provide AHJ with documentation of quality and manner in which those materials and assemblies are used.
- D. Load Tests:
 - 1. Proposed Construction and Construction in Progress: Where required by code, conduct tests listed below.
 - a. Load test procedures specified in code; periodic.
 - b. Load test procedures not specified in code; periodic.
 - c. Loadbearing Wall and Partition Assemblies: Load test with and without window framing; periodic.
 - d. Exterior Window and Door Assemblies: Wind load design pressure test; periodic.
 - 2. Completed Construction: Where required by code, conduct tests listed below.
 - a. Load test procedures specified in code; periodic.
 - b. Load test procedures not specified in code; periodic.

3.20 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

- A. Special Inspection Agency shall:
 - 1. Verify samples submitted by Contractor comply with the referenced standards and the approved Contract Documents.
 - 2. Provide qualified personnel at site. Cooperate with MBI Companies and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified reference standards.
 - 4. Ascertain compliance of materials and products with requirements of Contract Documents.
 - 5. Promptly notify MBI Companies and Contractor of observed irregularities or non-compliance of work or products.
 - 6. Perform additional tests and inspections required by MBI Companies.
 - 7. Attend preconstruction meetings and progress meetings.
 - 8. Submit reports of all tests or inspections specified.
- B. Limits on Special Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the work.

- C. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by MBI Companies.
- D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.21 TESTING AGENCY DUTIES AND RESPONSIBILITIES

- A. Testing Agency Duties:
 - 1. Test samples submitted by Contractor.
 - 2. Provide qualified personnel at site. Cooperate with MBI Companies and Contractor in performance of services.
 - 3. Perform specified sampling and testing of products in accordance with specified standards.
 - 4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 5. Promptly notify MBI Companies and Contractor of observed irregularities or non-compliance of work or products.
 - 6. Perform additional tests and inspections required by MBI Companies.
 - 7. Attend preconstruction meetings and progress meetings.
 - 8. Submit reports of all tests or inspections specified.
- B. Limits on Testing or Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the work.
- C. On instructions by MBI Companies, perform re-testing required because of non-compliance with specified requirements, using the same agency.
- D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

3.22 CONTRACTOR DUTIES AND RESPONSIBILITIES

- A. Contractor Responsibilities, General:
 - 1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
 - 2. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to work to be tested or inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
 - c. To facilitate tests or inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify MBI Companies and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
 - 5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 6. Retain special inspection records.
- B. Contractor Responsibilities, Seismic Force-Resisting System, Designated Seismic System, and Seismic Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.
- C. Contractor Responsibilities, Wind Force-Resisting System and Wind Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

3.23 MANUFACTURERS' AND FABRICATORS' FIELD SERVICES

- A. When specified in individual specification sections, require material suppliers, assembly fabricators, or product manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, to test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to MBI Companies 30 days in advance of required observations.
 - 1. Observer subject to approval of MBI Companies.
 - 2. Observer subject to approval of Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

END OF SECTION

PART 1 GENERAL

1.01 UTILITIES SERVICES FOR CONSTRUCTION PURPOSES

- A. The Contractor may use Owner's existing electrical and water service as required for construction purposes. The utility costs will be paid by the Contractor.
- B. The Contractor shall furnish and install all temporary piping and wiring required for the use of these services during construction and upon completion of the work shall remove such temporary piping and wiring.
- C. The use of existing services shall be in such a manner and by such methods that will not interrupt the services to any of the Owner's facilities that are to remain in operation during construction.

1.02 BARRICADES AND SPECIAL CONTROLS

- A. Provide temporary barriers, fences, and warning signs around the sites of new buildings to control access of unauthorized persons to work areas, and as required by law. Special care shall be taken to provide adequate barriers and warning signs to prevent access of unauthorized persons to work areas where hazardous work is being performed.
- B. Provide temporary barriers and warning signs at excavations that might be left open during nonworking hours, including warning lights at night.

1.03 CONSTRUCTION AIDS

- A. Provide necessary staging, scaffolding, and hoisting equipment and temporary walkways and ladders required for installation of the work under the Contract.

1.04 SANITARY FACILITIES

- A. Provide adequate temporary toilet facilities for the use of workmen, conforming to applicable laws, ordinances, and governmental regulations. Service sanitary facilities on a weekly basis.
- B. Upon completion of the work, temporary toilet facilities shall be removed from the site.
- C. Provide temporary sanitary facilities for use of the Building Occupants during the course of construction during time existing sanitary facilities have been removed from service and before new facilities are available for use of building occupants.
 - 1. Provide separate portable toilets for men and women.
 - a. Service portable toilets weekly at a minimum during the time they are in service.

1.05 TEMPORARY ENCLOSURES

- A. Provide temporary weathertight closures for all exterior openings after walls and roof of the new building are constructed when it is necessary to protect the work from the weather and to permit the use of temporary heat. Provide weathertight and security protection of the existing building until what time as the new construction can provide weathertightness and security. Provide safety barriers as required to protect the occupants of the building.
- B. Water Protection: Provide at all items for protection of excavation, trenches, and building from damage by rainwater, spring water, ground water, backing up of drains or sewers, and all other water. Provide all pumps, equipment, temporary drains or dams, and enclosures necessary to provide this protection.

1.06 TEMPORARY HEAT AND VENTILATION

- A. Provide temporary heat and ventilation as necessary for protection and drying out of the work and to allow work to be prosecuted in cold weather.

- B. Heat shall be provided by means of approved temporary heating equipment which in installation and operation will not damage the work. Provide adequate and proper fuels and all services required to furnish heat as required. Salamanders shall not be used inside the building. Heaters used to dry out or protect freshly placed concrete shall be of a type and shall be so ventilated as to prevent carbon dioxide from damaging concrete.
1. After the construction of the building has reached a point where the permanent heating and cooling systems are operable, the Contractor may use the permanent heating and cooling equipment for temporary heating and cooling. The heating and cooling systems shall not be used for temporary heat and cooling until the building is broom clean and shall not be used without all filters in place. Upon the completion of the work, all ducts and equipment shall be internally cleaned, and all filters shall be replaced with new filters.
 - a. If permanent HVAC system for temporary use during construction is used, 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 01 77 00.
 2. Contractor shall pay the hourly rate of the Engineer's and Testing and Balancing Agent's technical personnel to observe and document the condition of equipment and ductwork (30 minutes average per unit) used for construction term temporary heating and cooling. Engineers inspection of heat transfer coils must be complete prior to start-up, test and balance, and final acceptance. All warranties shall begin upon final acceptance by the Owner, not beneficial usage by the Contractor.
- C. Costs of providing temporary heat shall be borne by the Contractor.

1.07 BULLETIN BOARD AND JOB SIGN

- A. On or near the field office, the Contractor shall install a bulletin board upon which to post legally required notices. The bulletin board shall be of adequate size to contain all required notices and be so constructed as to protect the postings from obliteration by the weather.
- B. The Architect shall provide one painted sign stating the Architect (MBI Companies, Inc.). Location of sign shall be as directed by the Architect. The Contractor shall erect a substantial wood frame to support the sign provided by the Architect.
- C. Maintain all bulletin boards and job signs in good condition from start to completion of the work.

1.08 RODENT AND VERMIN CONTROL

- A. Provide on the project site ample and suitable refuse containers with covers. The Contractor shall be responsible for containing and removing from the site all refuse from meals eaten on the site and other rodent or vermin attracting refuse.
- B. During the construction period precaution shall be taken as necessary to control the entry and breeding of rodents and vermin in the new building.
- C. If, within three months after occupancy of the building, the building is found to be infested by rodents or vermin, the Contractor shall bear the cost of extermination.

1.09 REMOVAL OF CONSTRUCTION DEBRIS

- A. Provide suitable containers for and maintain regular a regular schedule for the removal of debris and rubbish from the construction site and surrounding area.
- B. Pay all container rental fees, hauling, and landfill costs associated with the removal of debris and rubbish from the site.

1.10 PROTECTION

- A. Weather Protection: Provide at all times protection against rain, wind, storms, frost, or heat to maintain all work, materials, equipment and fixtures free from injury or damage. At end of days work, all new work likely to be damaged by weather conditions shall be covered.
- B. Water Protection: Provide at all times protection of excavation, trenches, and building from damage by rainwater, spring water, ground water, backing up of drains or sewers, and all other water. Provide all pumps, equipment, temporary drains or dams, and enclosures necessary to provide this protection.
- C. 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.
- D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 01 10 00 - Summary.

1.11 TELEPHONE

- A. Provide a cellular phone number that will be used for 24-hour direct contact to the Contractor. The cellular phone shall be maintained from start to completion of the work. The cost of cellular service shall be paid by the Contractor.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations.
- F. Procedures for Owner-supplied products.
- G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Lists of products to be removed from existing building and identification of Owner-supplied products.
- B. Section 01 25 00 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- C. Section 01 40 00 - Quality Requirements: Product quality monitoring.
- D. Section 01 74 19 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 REFERENCE STANDARDS

- A. BIFMA e3 - Furniture Sustainability Standard; Business and Institutional Furniture Manufacturers Association; 2014.
- B. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

- A. See Section 01 30 00 – Administrative Requirements.

1.05 QUALITY ASSURANCE

- A. Composite Wood and Agrifiber: Products made of wood particles and/or plant material pressed and bonded with adhesive or resin such as particleboard, medium density fiberboard (MDF), plywood, wheatboard, strawboard, panel substrates, and door cores.
- B. Rapidly Renewable Materials: Made from agricultural products that are typically harvested within a 10-year or shorter cycle.
- C. Regional Materials: Materials that are extracted, harvested, recovered, and manufactured within a radius of 100 miles from the Project site.
- D. Reused Products: Materials and equipment previously used in this or other construction, salvaged and refurbished as specified.
 - 1. Wood fabricated from timber abandoned in transit after harvesting is considered reused, not recycled.
 - 2. Acceptable Evidence: Information about the origin or source, from Contractor or supplier.
- E. Sustainably Harvested Wood: Solid wood, wood chips, and wood fiber certified or labeled by an organization accredited by one of the following:
 - 1. American Forest Foundation, The American Tree Farm System; refer to <http://www.treefarmssystem.org>.
 - 2. Canadian Sustainable Forest Management System, under CAN/CSA Z809; refer to <http://www.csasfmforests.ca>.

3. The Forest Stewardship Council, The Principles for Natural Forest Management; for Canada visit <http://www.fscscanada.org>, for the USA visit <http://www.fscus.org>.
4. Sustainable Forestry Board, under The Sustainable Forestry Initiative® of the American Forest & Paper Association; refer to <http://www.afandpa.org>.
5. Acceptable Evidence: Copies of invoices bearing the certifying organization's certification numbers.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
- D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is required.
 1. See Section 01 10 00 for list of items required to be salvaged for reuse and relocation.
 2. If reuse of other existing materials or equipment is desired, submit substitution request.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. See Section 01 40 00 - Quality Requirements, for additional source quality control requirements.
- C. Use of products having any of the following characteristics is not permitted:
 1. Made using or containing CFC's or HCFC's.
 2. Made of wood from newly cut old growth timber.
 3. Containing lead, cadmium, or asbestos.
- D. Where other criteria are met, Contractor shall give preference to products that:
 1. If used on interior, have lower emissions.
 2. If wet-applied, have lower VOC content.
 3. Are extracted, harvested, and/or manufactured closer to the location of the project.
 4. Have longer documented life span under normal use.
 5. Result in less construction waste. See Section 01 74 19
 6. Are made of vegetable materials that are rapidly renewable.
 7. Are made of recycled materials.
 8. If made of wood, are made of sustainably harvested wood, wood chips, or wood fiber.
- E. Provide interchangeable components of the same manufacture for components being replaced.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 25 00 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

- A. See Section 01 10 00 - Summary for identification of Owner-supplied products.
- B. Owner's Responsibilities:
 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 2. Arrange and pay for product delivery to site.
 3. On delivery, inspect products jointly with Contractor.
 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 5. Arrange for manufacturers' warranties, inspections, and service.
- C. Contractor's Responsibilities:
 1. Review Owner reviewed shop drawings, product data, and samples.
 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 3. Handle, store, install and finish products.
 4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.
- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

- A. Provide protection of stored materials and products against theft, casualty, or deterioration.
- B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 74 19.
 1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.
- C. Store and protect products in accordance with manufacturers' instructions.
- D. Store with seals and labels intact and legible.
- E. Arrange storage of materials and products to allow for visual inspection for the purpose of determination of quantities, amounts, and unit counts.
- F. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

- G. For exterior storage of fabricated products, place on sloped supports above ground.
- H. Provide off-site storage and protection when site does not permit on-site storage or protection.
 - 1. Execute a formal supplemental agreement between Owner and Contractor allowing off-site storage, for each occurrence.
- I. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- J. Comply with manufacturer's warranty conditions, if any.
- K. Do not store products directly on the ground.
- L. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- M. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- N. Prevent contact with material that may cause corrosion, discoloration, or staining.
- O. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- P. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
- B. Section 01 45 00 - Quality Control: Testing and inspection procedures.
- C. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures, and temporary interior partitions.
- D. Section 01 74 19 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- E. Section 02 41 19 – Selective Demolition: Demolition of parts of structures; site utility demolition.
- F. Individual Product Specification Sections:
 - 1. Advance notification to other sections of openings required in work of those sections.
 - 2. Limitations on cutting structural members.

1.03 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

- A. See Section 01 30 00.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
 - 1. On request, submit documentation verifying accuracy of survey work.
 - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
 - 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
 - 1. Structural integrity of any element of Project.
 - 2. Integrity of weather exposed or moisture resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.

- e. Effect on work of Owner or separate Contractor.
- f. Written permission of affected separate Contractor.
- g. Date and time work will be executed.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS

- A. For demolition work, employ a firm specializing in the type of work required.
- B. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to MBI Companies. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities.

1.06 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
 - 2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
 - 1. Minimize amount of bare soil exposed at one time.
 - 2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 - 3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
 - 4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
 - 1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers.
 - 2. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
- H. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
 - 1. Pest Control Service: Weekly treatments.
- I. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- J. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

- A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Notify affected utility companies and comply with their requirements.
- C. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable;

place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean-up of work of separate sections.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 25 00 – Substitution Procedures.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or mis-fabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify MBI Companies four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.

- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to MBI Companies, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify MBI Companies of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Control datum for survey is that established by Owner provided survey.
- E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- F. Promptly report to MBI Companies the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to MBI Companies.
- H. Utilize recognized engineering survey practices.
- I. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
 - 2. Grid or axis for structures.
 - 3. Building foundation, column locations, and ground floor elevations.
- J. Periodically verify layouts by same means.
- K. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 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 indicated.
 - 2. Report discrepancies to MBI Companies before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
 - 1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
 - 2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
- C. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on drawings.
 - 2. Relocate items indicated on drawings.

3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 3. 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.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. Provide temporary connections as required to maintain existing systems in service.
 4. Verify that abandoned services serve only abandoned facilities.
 5. 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; patch holes left by removal using materials specified for new construction.
- 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.
- F. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
- G. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- H. Refinish existing surfaces as indicated:
1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- I. Clean existing systems and equipment.
- J. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- K. Do not begin new construction in alterations areas before demolition is complete.
- L. Comply with all other applicable requirements of this section.
- 3.07 CUTTING AND PATCHING
- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
1. Complete the work.
 2. Fit products together to integrate with other work.
 3. Provide openings for penetration of mechanical, electrical, and other services.
 4. Match work that has been cut to adjacent work.
 5. Repair areas adjacent to cuts to required condition.
 6. Repair new work damaged by subsequent work.
 7. Remove samples of installed work for testing when requested.
 8. Remove and replace defective and non-complying work.

- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.
- J. Patching:
 - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
 - 2. Match color, texture, and appearance.
 - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- D. Verify that wiring and support components for equipment are complete and tested.

- E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

- A. Conduct training session for Owner's designated personnel covering various mechanical, electrical, and other operating features for familiarization with the physical plant equipment and operation. One copy of the required (see various technical sections on project closeout) mechanical operations manual shall be on hand during this session along with the mechanics familiar with all equipment. These mechanics shall have on hand such tools and/or equipment to reveal controls and mechanic access areas. The instruction session shall be scheduled for a full day but in no case less than the minimum time required to review each type of equipment/operation. The minimum areas of instruction shall be:
 - 1. Location and operation of project site water valves, meters and other operational equipment.
 - 2. Location and operation of project electrical disconnects.
 - 3. Operation of sewage handling facilities.
 - 4. Sprinkler valves, alarms, test and operation.
 - 5. Project landscape irrigation operation.
 - 6. Project Site lighting operation/maintenance.
 - 7. Storm sewer operation/configuration.
 - 8. Refuse containment areas.
 - 9. Roof maintenance/warranty considerations. Traffic cautions.
 - 10. HVAC unit operations/maintenance (filters and thermostats, boiler and/or cooling tower maintenance).
 - 11. Interior lighting, lamp and ballast replacement.
 - 12. Keying and lock operations.
 - 13. Locations and use of required replacement finish materials such as floor and ceiling tiles and panels.
 - 14. Notification procedures for Contractor warranty work.
- B. Video Tape Owner's Instruction Session and provide two (2) copies on DVD to Owner as part of Close Out Documentation.

3.12 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

- A. Use cleaning materials that are nonhazardous.
- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- E. Clean filters of operating equipment.
- F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems.
- G. Clean site; sweep paved areas, rake clean landscaped surfaces.
- H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 SUBSTANTIAL COMPLETION

- A. Notify the owner not less than twenty-one (21) days prior to the date of substantial completion to allow notification of tenants.
- B. Submit written certification to Architect that Project, or designated portion of Project, is substantially complete. Include a list of items to be completed or corrected as a result of his inspection of the work.

- C. Submit the Certificate of Occupancy issued by the local building authority to the Architect for forwarding to the Owner.
- D. The Architect will make an inspection within seven (7) days after receipt of certification, together with Owner's Representative.
- E. Should the Architect consider the work substantially complete:
 - 1. The Contractor shall prepare, and submit to the Architect, a list of items to be completed or corrected, as determined by the Architect's inspection.
 - 2. The Architect will prepare and issue a certificate of substantial completion, AIA document G704, complete with signatures of Owner, Contractor, and Architect, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect.
 - 3. The Owner will occupy the project, under provisions stated in certificate of substantial completion.
 - 4. The Contractor will complete work listed for completion or correction, within the designated time.
 - 5. Refer to Supplementary Conditions Article 9.10.6 for failure to complete in a timely manner.
- F. Should the Architect consider that the Work is not Substantially Complete:
 - 1. He shall immediately notify Contractor, in writing stating reasons.
 - 2. The Contractor shall complete the Work, and send second written notice to the Architect, certifying that the project or designated portion of project, is substantially complete.
 - 3. The Architect will reinspect the work at the Contractor's expense.

3.15 CLOSEOUT PROCEDURES AT FINAL COMPLETION:

- A. As a precedent to final acceptance of the work and issuance of Certificate of Final Payment, including the Release of Retainage, certain submittals shall be made as specified in the various sections of the specifications. All such submittals shall be delivered to the Architect, in the form and number of copies specified, prior to or with the Contractor's request for final payment. Submittals shall include but not be limited to:
 - 1. General Contractor's Affidavit, Waiver and Release of Lien Statements and Consent of Surety, to final payment as well as release of lien statements from all subcontractors and major material suppliers as specified in Subparagraph 9.10.2 of the General Conditions. These documents shall be addressed to the Owner and shall be original signed documents and not reproduced copies. Two (2) sets of these drawings shall be submitted.
 - 2. Written guarantees and warranties as specified in the various other sections of the specifications.
 - 3. Record drawings as specified in the General Conditions and in Divisions 15 and 16. Include electronic files provided to Contractor for use in the project with as-built information added.
 - 4. One copy of each final approved shop drawing submitted during the course of the project. Include electronic files provided to Contractor for use in the project with as-built information added.
 - 5. Three copies of operation and maintenance data for mechanical equipment and electrical equipment.
 - 6. Letter stating that to the best of the Contractor's knowledge, no asbestos containing materials or other Work hazardous materials or products as currently defined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or Environmental Protection Agency (EPA) regulations, rules, or requirements, as amended
 - 7. Contract Close-Out Submittals, except for record drawings, shall be submitted in commercial quality three ring binders with durable plastic covers. Identify the project on the face and side of the binders. Provide a cover sheet giving complete Project Title, Contractor's and Architect's name, address, phone number, name of project superintendent, and related general information. Include a Table of Contents to identify material in the Project Data Binders and a complete listing of subcontractors and material suppliers. Provide copies of all Certificates, Warranties and related documents as well as Product Data, Maintenance and Operation Data and related information required by the Contract Documents or furnished with items included in the Project. Two (2) sets of these documents shall be submitted.
- B. Submit written certification that the Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for final inspection by Owner and Architect.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments and sum remaining due.

3.16 WARRANTIES:

- A. Provide notarized copies.
- B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three D side ring binders with durable plastic covers. Note: This is in addition to copies of warranties provided with operation and maintenance binders.
- D. Submit prior to final Application for Payment.
- E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as warranty period.

3.17 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance, and extra materials in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed, obtain receipt prior to final payment.

END OF SECTION

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.
- E. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
- F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

- A. Section 01 30 00 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. Section 01 50 00 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
- C. Section 01 60 00 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
- D. Section 01 70 00 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.
- F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.
- G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.
- H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- I. Return: To give back reusable items or unused products to vendors for credit.

- J. Reuse: To reuse a construction waste material in some manner on the project site.
- K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.
- M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- N. Toxic: Poisonous to humans either immediately or after a long period of exposure.
- O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

- A. See Section 01 30 00.
- B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
 - 1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
 - 2. Submit Report on a form acceptable to Owner.
 - 3. Landfill Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project disposed of in landfills.
 - c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - 4. Incinerator Disposal: Include the following information:
 - a. Identification of material.
 - b. Amount, in tons or cubic yards, of trash/waste material from the project delivered to incinerators.
 - c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - 5. Recycled and Salvaged Materials: Include the following information for each:
 - a. Identification of material, including those retrieved by installer for use on other projects.
 - b. Amount, in tons or cubic yards, date removed from the project site, and receiving party.
 - c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
 - d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
 - e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
 - 6. Material Reused on Project: Include the following information for each:
 - a. Identification of material and how it was used in the project.
 - b. Amount, in tons or cubic yards.
 - c. Include weight tickets as evidence of quantity.
 - 7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 2 PRODUCTS – (NOT USED)

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 01 30 00 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. See Section 01 50 00 for additional requirements related to trash/waste collection and removal facilities and services.

- C. See Section 01 60 00 for waste prevention requirements related to delivery, storage, and handling.
- D. See Section 01 70 00 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.
- B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and MBI Companies.
- C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- D. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Pre-bid meeting.
 - 2. Pre-construction meeting.
 - 3. Regular job-site meetings.
- E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
 - 1. Provide containers as required.
 - 2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
 - 3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.
- F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
- G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.
- H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
- I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Section 00 72 00 - General Conditions and 00 73 00 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to MBI Companies with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. MBI Companies will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with MBI Companies comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.

- D. Record information concurrent with construction progress.
 - E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
 - F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.
- 3.02 OPERATION AND MAINTENANCE DATA
- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
 - B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
 - C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
 - D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
- 3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES
- A. For Each Product, Applied Material, and Finish:
 - 1. Product data, with catalog number, size, composition, and color and texture designations.
 - 2. Information for re-ordering custom manufactured products.
 - B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
 - C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
 - D. Additional information as specified in individual product specification sections.
 - E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- 3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS
- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
 - B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
 - C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

- D. Include color coded wiring diagrams as installed.
 - E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
 - F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
 - 1. Include HVAC outdoor and exhaust air damper calibration strategy.
 - a. Include provisions which ensure that full closure of dampers can be achieved.
 - 2. Include Carbon Dioxide Monitoring Protocol.
 - 3. Include Carbon Monoxide Monitoring Protocol.
 - 4. Include Frost Mitigation Strategy for ventilation heat-recovery system.
 - G. Provide servicing and lubrication schedule, and list of lubricants required.
 - H. Include manufacturer's printed operation and maintenance instructions.
 - I. Include sequence of operation by controls manufacturer.
 - J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
 - K. Provide control diagrams by controls manufacturer as installed.
 - L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
 - M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
 - N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
 - O. Include test and balancing reports.
 - P. Additional Requirements: As specified in individual product specification sections.
- 3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS
- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
 - B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
 - C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
 - D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
 - E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of MBI Companies, Consultants, Contractor and subcontractors, with names of responsible parties.
 - F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
 - G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
 - H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
 - I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
 - J. Arrangement of Contents: Organize each volume in parts as follows:
 - 1. Project Directory.

2. Table of Contents, of all volumes, and of this volume.
3. Operation and Maintenance Data: Arranged by system, then by product category.
 - a. Source data.
 - b. Product data, shop drawings, and other submittals.
 - c. Operation and maintenance data.
 - d. Field quality control data.
 - e. Photocopies of warranties and bonds.
4. Design Data: To allow for addition of design data furnished by MBI Companies or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

3.06 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
- F. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- G. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- H. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- I. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION



Report of Geotechnical Exploration
Norris Middle School Addition
Norris, Tennessee
S&ME Project No. 219016

PREPARED FOR:

**MBI Companies, Inc.
299 North Weisgarber Road
Knoxville, Tennessee 37919**

PREPARED BY:

**S&ME, Inc.
1413 Topside Road
Louisville, TN 37777**

December 6, 2021



December 6, 2021

MBI Companies, Inc.
299 North Weisgarber Road
Knoxville, Tennessee 37919

Attention: Mr. Charles Grant, AIA

Reference: **Report of Geotechnical Exploration
Norris Middle School Additions**
5 Norris Square
Norris, Tennessee 37828
S&ME Proposal No. 219016

Dear Mr. Grant:

The following report presents the results of our geotechnical services conducted at the above-referenced site in Norris, Tennessee. The work was performed in general accordance with S&ME Proposal No. 219016, dated September 27, 2021, and was authorized by you on September 29, 2021. The purpose of our geotechnical exploration was to explore subsurface conditions and provide geotechnical recommendations for general site grading and design and construction of foundations.

Sincerely,

S&ME, Inc.

A handwritten signature in blue ink that reads "Ken Kolesar".

Ken Kolesar, E.I.
Staff Professional



Daniel Boles
Dec 6 2021 9:35 AM

DocuSign

Daniel R. Boles, P.E.
Senior Geotechnical Engineer
TN Registration No. 103726



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1.0 Introduction

1.1 Purpose

The purpose of our geotechnical exploration was to explore subsurface conditions and provide geotechnical recommendations for general site grading and design and construction of foundations. The geotechnical exploration involved a site reconnaissance, field exploration, laboratory testing, and engineering analysis. This report provides the following:

- A review of surface topographic features and site conditions;
- A review of area geologic conditions;
- A review of the field exploration methods;
- A *Boring Location Plan* and individual boring logs for each boring location;
- A summary of the subsurface conditions encountered in the borings;
- A summary of laboratory test methods and results;
- Conclusions and Site Assessment, including assessments related to geologic hazards, as applicable;
- Recommendations for site preparation, structural fill placement, and groundwater control, if encountered; and
- Recommendations for shallow foundation design, including an allowable bearing capacity, and construction guidelines;

1.2 Site and Project Description

Project information was provided via email correspondence between Mr. Charles Grant with MBI Companies, Inc. and Mr. Jason Reeves of S&ME on September 23, 2021. In addition, Mr. Dan Boles with S&ME spoke with Mr. Grant on September 24, 2021. The project consists of the expansion of the existing Norris Middle School to include the addition of six new classrooms and associated parking areas. Included in the email correspondence was an aerial image of the school property with a sketch of the proposed project area.

The project site is located along the southwest side of the existing Norris Middle School located at 5 Norris Square in Norris, Tennessee. The project site is relatively level, and we estimate less than 3 feet of cut or fill will be required to bring the project site to grade. The site is mostly grass covered and a portion of the area is paved. The building addition will be one-story, and we expect the construction to consist of concrete masonry unit walls and concrete slab on grade. We assume wall and column loads will not exceed 5 kips per linear foot and 100 kips, respectively.

The project information and any assumptions detailed in this report should be reviewed and confirmed by the appropriate team members. Modifications to our recommendations may be required if the planned development differs from our stated information and/or assumptions.



2.0 Exploration and Testing Programs

2.1 Field Exploration

2.1.1 General

The subsurface conditions were explored on October 8, 2021, with seven soil test borings (designated B-01 through B-07) located within the project site in general accordance with ASTM D1586, the *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils* and ASTM D2488, the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*. Refer to the *Boring Location Plan, Figure 1*, in the Appendix for the approximate boring locations. The borings were located and marked in the field by estimating distances from existing site landmarks (i.e., slab edges and corners, building corners and drives, etc.). Ground surface elevations were obtained by plotting the boring locations on a KGIS topographic map of the project area. Based on the methods used to establish the locations and ground surface elevations of the test borings, this information should be considered approximate. If more precise location information is required, a professionally licensed surveyor should be retained to obtain that information.

2.1.2 Soil Test Borings

The test borings were advanced by mechanically twisting 3 ¼-inch diameter hollow stem augers (HSA) into the ground with a Deidrich D-50 ATV mounted drill rig.

Soil samples were obtained with a standard 1.4-inch inside diameter (ID), 2-inch outside diameter (OD) split-spoon sampler at 2½-foot intervals to a depth of 10 feet and on 5-foot intervals below depths of 10 feet to the boring refusal depths. The sampler was first seated 6 inches and then driven an additional foot with blows of the 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the 2nd and final 6-inch increments was recorded and is designated as the *standard penetration resistance* (N-value) with units of blows per foot (bpf). The N-value provides a general indication of in-situ soil conditions and has been correlated with certain engineering properties of soils.

The soil samples obtained during our field activities were visually classified by members of our engineering staff in general accordance with ASTM D2488, the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*. The resulting soil descriptions are shown on the Test Boring Logs in the Appendix. Soil consistencies provided on the boring logs are based on correlations with N-values and visual/manual procedures.

Subsurface water level readings were taken in each of the borings during drilling and upon completion of the soil drilling process. Upon completion of drilling and sampling, each borehole was backfilled with soil cuttings, borehole closure device, and concrete patch. Due to safety concerns, the boreholes were not left open for delayed subsurface water level measurements.



2.2 Laboratory Test Program

Select samples were subjected to moisture content (ASTM D2216), Atterberg Limits (ASTM D4318), and No. 200 sieve wash to aid our soil classification and analyses. Laboratory test results are summarized in Section 4.3 of this report.

3.0 Subsurface Conditions

3.1 Site Geology

The project site is located within the Appalachian Valley and Ridge Physiographic Province of East Tennessee. This Province is characterized by elongated, northeasterly-trending ridges formed on highly resistant sandstone and shale. Between ridges, broad valleys and rolling hills are formed primarily on less resistant limestone, dolomite, and shale.

Published geologic information indicates the site is underlain by the Mascot Dolomite formation of the Knox Group. This formation is generally composed of well-bedded light-gray dolomite containing minor amounts of limestone. The Mascot Dolomite formation typically weathers to produce a light-tan to dark-orange residual clay overburden. Silica in the form of chert is resistant to weathering and typically scattered throughout the residuum.

Since the bedrock underlying this site contains carbonate rock (i.e., limestone/dolomite), it is susceptible to the hazards of irregular weathering, cave and cavern conditions, and overburden sinkholes. Carbonate rock, while appearing very hard and resistant, is soluble in slightly acidic water. This characteristic, plus differential weathering of the bedrock mass is responsible for these hazards. Of these hazards, the occurrence of sinkholes is potentially the most damaging to overlying soil-supported structures. Sinkholes occur primarily due to differential weathering of the bedrock mass and flushing of overburden soil into the cavities within the bedrock. This loss of solids creates a cavity, or dome, within the overburden. Growth of the cavity over time, or excavation over the dome, can create a condition in which rapid subsidence, or collapse, of the roof of the dome occurs.

A certain degree of risk with respect to sinkhole formation and subsidence should be considered with any site located within geologic areas underlain by potentially soluble rock units. While a rigorous effort to assess the potential for sinkhole formation on this site was beyond the scope of this evaluation, our borings did not encounter obvious indications of sinkhole development. In addition, we did not observe any surface signs of sinkhole activity at the site. It is our opinion the risk of sinkhole development at this site is comparable to other sites located within similar geologic settings which have been developed successfully. However, the owner must be willing to accept the risk of future sinkhole development at this site.



3.2 Soil Stratification

3.2.1 Surface Cover

In each of the boring, from the ground surface to depths ranging from about 5 to 6 inches topsoil was encountered.

3.2.2 Residuum

Residual soils were encountered beneath the surface soils in each boring and extended to depths ranging from 7.5 to 20 feet. Residual soils are soils weathered from the underlying parent bedrock. The residual soils generally consisted of fat clay with varying amounts of sand, silt, and weathered rock fragments and clayey sand with gravel (rock fragments). The SPT N-values of the fine grained residual soils ranged from 6 blows per foot (bpf) to greater than 50 bpf, indicating consistencies of firm to very hard. Typically, the SPT N-values indicated stiff to very stiff soil consistencies. The N-values for the coarse grained soil ranged from 12 to 30 bpf indicating a medium dense relative density. Coarse grained soils consisted of weathered rock and rock fragments. Two borings refused in residual soil.

3.2.3 Refusal Material

Auger refusal was encountered in borings B-02 and B-05 at 14.1 and 7.5 feet, respectively. Refusal is a designation applied to any material that cannot be penetrated by the power auger. Auger refusal may indicate boulders, rock ledges or pinnacles, or the top of continuous bedrock. Rock coring was beyond the scope of this exploration and thus, the character and continuity of the refusal materials were not determined. Ground Water

Ground water was not encountered in any of the borings at the time of drilling. The borings were backfilled upon completion in consideration of safety and stabilized (24 hour) ground water levels were not measured.

Ground water levels fluctuate due to seasonal changes in precipitation amounts, construction activities in the area, and/or other factors. The ground water information presented in this report is the information collected at the time of our field activities.

3.2.4 General

The subsurface descriptions below are of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in the Appendix should be reviewed for specific information at individual test locations. The depth and thickness of the subsurface strata indicated on the boring logs were generalized from and interpolated between boring locations. The transition between materials may be more gradual than indicated on the boring logs. Information on actual subsurface conditions exists only at the specific boring locations and is relevant to the time the exploration was performed. Variations may occur and should be expected between boring locations. The stratification lines were used for our analytical purposes and, unless specifically stated otherwise, should not be used as the basis for design or construction cost estimates.



3.3 Laboratory Test Results

The moisture content of the tested samples ranged from 14.8 to 40.9 percent. Additional test results are summarized in Tables 4-1 below.

Table 1-1 Soil Classification Test Results

Boring No.	Depth (feet)	Liquid Limit	Plastic Limit	Plasticity Index	Percent Finer than the #200 Sieve	USCS Classification based on Plasticity Index and Percent Finer than the No. 200 Sieve
B-03	3.5-5	117	37	80	58.9	CH

4.0 Conclusions and Recommendations

The conclusions and recommendations presented in this report are based on the preceding project information, and the results of this exploration. Actual subsurface conditions may vary between the boring locations. If it becomes apparent during construction that encountered conditions vary substantially from those presented herein, this office should be notified at once. At that time, the conditions can be evaluated, and the recommendations of this report modified, in written form, if necessary. Also, if the scope of the project should change significantly from that described herein, we should be notified, and these recommendations should be re-evaluated.

4.1 General

The conclusions and recommendations presented in this report are based on the preceding project information, and the results of this exploration. Actual subsurface conditions may vary between the boring locations. If it becomes apparent during construction that encountered conditions vary substantially from those presented herein, this office should be notified at once. At that time, the conditions can be evaluated, and the recommendations of this report modified, in written form, if necessary. Also, if the scope of the project should change significantly from that described herein, we should be notified, and these recommendations should be re-evaluated.

4.2 Site Assessment

Several risks and challenges should be understood during the design and planning phases of the project. Provided these risks and challenges are acceptable, we anticipate the proposed structure can be supported by conventional shallow foundations.



- ◆ Highly plastic clays were encountered at the site in Boring B-03. High PI soils can impact site grading and structural performance because of the soil's sensitivity to water. Plasticity considerations are discussed further in the following sections of this report.
- ◆ The site is located in a karst geologic area. The underlying carbonate rock units are susceptible to sinkhole development. Typically, the risk of sinkhole formation can be reduced somewhat by managed construction practices as provided in this report. It should be noted several sites with similar subsurface conditions have been developed successfully in this area. However, the inherent risk of sinkhole formation will exist.
- ◆ Auger refusal was encountered at depths of 7.5 and 14.1 feet in two of the borings which may impact excavation of foundations.

Structural details to make the building flexible should be considered to accommodate potential volume changes in the subgrade. Floor slabs should be liberally jointed to control cracking, and the floor slab should not be structurally connected to the walls. Walls should incorporate sufficient expansion/contraction joints to allow for differential movement.

4.3 Shallow Foundation Recommendations

Assuming those challenges/risks previously discussed are acceptable and properly addressed, support for the wall and column loads up to 5 kips per linear foot and 100 kips, respectively, on shallow, soil-supported foundations will be appropriate. Foundation subgrades will require remediation in areas containing soils not recommended for foundation support. Shallow foundations bearing on properly approved residual soils and/or compacted fill may be proportioned for an allowable bearing capacity of 2,500 pounds per square foot (psf) or less.

Variations in the consistency of the bearing materials could affect the performance of these foundations, regardless of the allowable bearing pressure; therefore, it is critical that foundation observations be performed by a representative of the geotechnical engineer of record and that undercutting, or improvement of the subgrade occurs as needed. Continuous wall foundations should typically be designed to have a minimum width of 24 inches and column footings should have a minimum width and length of 54 inches. All spread foundations should bear at least 18 inches below subgrade to provide confinement and frost protection.

The foundation bearing soils should be observed by the geotechnical engineer or their representative prior to placing reinforcing steel or concrete. In selected foundation excavations, Dynamic Cone Penetrometer (DCP) testing in hand auger borings may be performed to provide additional data on foundation bearing soils. The engineer can provide geotechnical guidance to the owner's design team should poor bearing conditions be identified during construction.

Foundation bearing surfaces should not be disturbed or left exposed during inclement weather. Excavations for foundations should be hand cleaned to remove loose soil, rock, or mud from the foundation bearing surface. If construction occurs during inclement weather and it is not possible to place concrete immediately after excavation, we recommend a thin layer (approximately 2 inches) of lean concrete be placed on the bearing surface



for protection after we have observed and evaluated the exposed bearing surfaces. The foundation excavation depth should account for the mud mat thickness.

4.4 Slabs-on-Grade Recommendations

Slabs-on-grade may be supported on residual soils and/or approved fill material, provided the subgrade is prepared according to the recommendations in this report. Based on published correlations between anticipated slab subgrade soil types and modulus of subgrade reaction, k (ASTM D1196), we recommend a slab subgrade soil modulus of subgrade reaction of 100 pci (psi per inch) for design of slabs. These values are based on published correlations between the type and condition of the soils expected at this site and small-diameter plate load tests. The modulus value is considered appropriate for point loads and small-diameter wheel loads but must be modified (reduced) for wide area loads. To provide a level of soil subgrade protection from weather related deterioration, we suggest a 4-inch thickness of compacted dense-graded stone base.

Surface drainage should be controlled during construction to prevent excessive surface water drainage beneath completed slabs. Immediately prior to placement of dense-graded stone base material and concrete, the subgrade should be proofrolled to detect subgrade areas that may have softened, loosened, or otherwise been disturbed by construction activities or weather. The proofroll should be observed by a representative of the geotechnical engineer. Areas found to deflect excessively should be repaired.

Slabs on grade are not likely to be subjected to hydrostatic pressure from groundwater. However, water vapor transmission through slabs is still a design consideration. Evaluating the need for and design of a moisture retarder or moisture barrier for moisture control is outside our scope of services and should be provided by the slab designer based on the planned floor coverings and the corresponding design constraints, as outlined in ACI 302.1R-04 Guide for Concrete Floor and Slab Construction. Further, health and environmental considerations with respect to any potentially harmful vapor transmission are also outside of our scope.

The above discussion provides information for support and construction of grade slabs at the site. The slab design (performed by others) should also address slab thickness, subbase, strength, jointing, curing, surface finish, flatness/levelness, and any floor finish system requirements.

4.5 General Pavement Design Recommendations

Paving materials and procedures should conform to applicable sections of the Tennessee Department of Transportation (TDOT) Standard Specifications for Road and Bridge Construction, latest edition. We recommend the mineral aggregate surface and base be compacted to 100 percent of its maximum dry density as determined by the standard Proctor test.

In areas that do not have an acceptable proofroll, undercut and replacement of lower consistency soils should be anticipated. Typically, the lower consistency soil may be undercut and backfilled with properly compacted fill. There is the potential for undercut to be reduced if backfill consists of crushed stone or weathered shale combined with a geogrid such as a Tensar 1100, or approved equivalent.



All paved areas should be constructed with positive drainage to direct water off-site and to minimize surface water seeping into the pavement subgrade. The subgrade should have a minimum slope of 1 percent. In down grade areas, the base course should extend through the slope to allow any water entering the base course an exit path. We also recommend the installation of underdrains and pavement edge drains. Underdrains should be designed to daylight and discharge or connect directly to existing roadway drainage structures.

5.0 Construction Considerations

5.1 Site Preparation

Site preparation should be initiated by clearing all vegetation, topsoil, and other deleterious materials to a distance at least 10 feet outside the building limits.

After initial site preparation is complete, the stability of the exposed subgrade in areas to receive fill and/or at grade should be evaluated by the geotechnical engineer. This evaluation may be aided by methodically proofrolling the exposed subgrade with a loaded tandem-axle dump truck weighing at least 20 tons, or other rubber-tired construction equipment with similar wheel loads. Any areas which are determined by the geotechnical engineer to rut, pump or deflect excessively should be undercut to firm bearing soils and backfilled with well-compacted soil or repaired in-place by scarifying, drying, and recompacting the in-place soils. Once any areas identified by proofrolling have been repaired, the site should be brought to grade by making the necessary fills.

Subgrade repair can be expected to be much more extensive if grading operations are performed during wet periods of the year because the in-place soils can be moisture sensitive and can be softened by rubber-tired construction traffic when wet. It will, therefore, be advantageous to perform earthwork and foundation construction activities during warmer and drier months of the year.

Stable subgrade surfaces at the time of grading will become unstable during wet weather and/or as heavy construction equipment traffic traverse the prepared surface. Subgrade damage can be reduced by maintaining positive surface drainage during grading operations and construction to prevent water from ponding on the surface. Additionally, the surface should be rolled smooth to enhance drainage if precipitation is expected.

Subgrades damaged by construction equipment should be promptly repaired to avoid further degradation in adjacent areas and to prevent water ponding. Construction traffic should be limited to specific areas during grading to avoid degrading subgrades throughout the site, particularly after precipitation events. The geotechnical engineer should be contacted to provide recommendations for treatment if the soils become excessively wet, dry, or frozen.

5.2 High Plasticity Soil Considerations

Based on our experience in the East Tennessee area, soils with plasticity indices (PI) less than 30 percent have a slight potential for volume changes with changes in moisture content, and soils with a PI greater than 50 percent



are highly susceptible to volume changes. Between these values, we consider the soils to be moderately susceptible to volume changes. The laboratory test results indicate that the soils at this site are moderately susceptible with a PI value of 80 percent.

Highly plastic soils have the potential to shrink or swell with significant changes in moisture content. Unlike other areas of the country where high plasticity soils cause considerable foundation problems, East Tennessee does not typically endure long periods of severe drought or wet weather. However, in recent years drought conditions have been sufficient to cause soil shrinkage and related structural distress of buildings, floor slabs and pavements at sites underlain by high plasticity soils.

At sites that have high plasticity soils, certain precautions should be considered to minimize or eliminate the potential for volume changes. The most effective way to eliminate the potential for volume changes is to remove highly plastic soils and replace them with compacted fill of non-expansive material. Testing and recommendations for the required depth of removal can be provided, if needed. If removal of the highly plastic soils is not desirable, then measures should be taken to protect the soils from excessive amounts of wetting or drying. In addition, modification of the soils by lime or cement treatment can be utilized to reduce the soil plasticity.

Several construction considerations may reduce the potential for volume changes in the subgrade soils. Foundations should be excavated, checked, and concreted in the same day to prevent excessive wetting or drying of the foundation soils. The floor subgrade should be protected from excessive drying and wetting by covering the subgrade prior to slab construction. The site should be graded in order to drain surface water away from the building both during and after construction. Installing moisture barriers around the perimeter of the slab will help limit the moisture variation of the soil and reduce the potential for shrinking or swelling. In addition, roof drains should discharge water away from the building area and foundations. Heat sources should be isolated from foundation soils to minimize drying of the foundation soils. Trees and large shrubs can draw large amounts of moisture from the soil during dry weather and should be kept well away from the building to prevent excessive drying of the foundation soils. Watering of lawns or landscaped areas should be performed to maintain moisture levels during dry weather.

5.3 Moisture Sensitive Soils

The fine-grained soils encountered at this site are expected to be sensitive to disturbances caused by construction traffic and changes in moisture content. During periods of wet weather, increases in the moisture content of the soil can cause reduction in the soil strength and support capabilities. In addition, soils which become wet may be slow to dry and thus retard construction progress. It will, therefore, be advantageous to perform earthwork and foundation construction activities during warmer and drier months of the year.

5.4 Excavation

As previously noted, the borings were advanced to their target depths of 20 and 10 feet except for Boring B-02 and B-05. Borings B-02 and B-05 encountered auger refusal at 14.1 feet and 7.5 feet, respectively. Based on the boring data, it appears site grading and excavation can generally be performed with conventional earthmoving



equipment (backhoes, scrapers/pans, bulldozers, etc.). However, excavation equipment varies, and field refusal conditions may vary. Generally, the weathering process is erratic, and variations in the rock profile can occur in small lateral distances, as previously discussed. Therefore, the need for difficult/rock excavation should not be totally discounted, and we suggest including modest provisions for difficult excavation within construction contracts should the need arise. If encountered, competent rock would likely and weathered rock may require hydraulic hammers and/or splitters to excavate. Excavation for temporary or permanent conditions should comply with Occupational Safety and Health Administration (OSHA) requirements.

5.5 Fill Placement and Compaction

Fill operations should not begin until representative samples of proposed fill soils are collected and tested. We recommend allowing 3 to 5 days to complete sampling and testing in advance of fill placement activities. The test results will be used to evaluate whether the proposed fill soils meet appropriate specifications and for quality control during grading.

We recommend structural soil fill be defined as inorganic, natural soil with maximum particle sizes of 4 inches and plasticity index (PI) of 35 and less. Based on our observations and the laboratory testing, the on-site soils generally appear to exceed these requirements. The plasticity index of the tested sample of soil from the site was 80 percent. Based on our observations, the site soils sampled are very plastic.

Structural soil fill should be placed in loose, horizontal lifts not exceeding 8 inches in thickness. Each lift should be compacted to at least 98 percent of the maximum dry density (MDD) as determined by the standard Proctor method (ASTM D 698). Further, we recommend the materials have a minimum MDD of 90 pcf as determined by the standard Proctor method. The moisture content should be controlled to within 3 percentage points of optimum moisture content. In addition to meeting the compaction requirement, fill material should be stable under the movement of the construction equipment and should not exhibit rutting or pumping.

The fill should be uniformly well compacted. Accordingly, fill placement should be observed by a qualified field technician working under the direction of our geotechnical engineer. In addition to this visual evaluation, the technician should perform in-place field density tests to confirm whether the contractor's means and methods can achieve the recommended compaction. Areas that do not meet the compaction specification should be recompacted to achieve compliance.

5.6 Dense-Graded Aggregate Fill

Dense Graded aggregate may be used as fill and for utility backfill. The dense graded aggregate used for this section should be Type A, Grading D or E in accordance with Section 903.05 of the Tennessee Department of Transportation (TDOT) specifications. Dense graded aggregate should be placed in loose, horizontal lifts not exceeding 10 inches in thickness. Each lift should be compacted to at least 95 percent of the aggregate's maximum dry density per the standard Proctor test method (ASTM D698). Each lift should be compacted by the Contractor and then tested and observed by geotechnical personnel before placing any subsequent lifts.



5.7 Drainage and Surface Water Concerns

To help reduce the potential for instability in the exposed soil during wet weather conditions, water should not be allowed to collect within undercut or foundation excavations, on floor slab areas, or on prepared subgrades either during or after construction. Positive site surface drainage should be provided to reduce infiltration of surface water around the perimeter of structures and beneath floor slabs. The grades should be sloped away from structures, and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the structures.

5.8 Groundwater Considerations

Groundwater was not encountered in any borings. Groundwater depths can vary based upon season and prevailing weather conditions. The groundwater information presented in this report is the information collected at the time of our field activities. We do not expect significant groundwater will be encountered during site grading or in the shallow excavations for the building structure as we expect cuts and excavations will generally be less than 3 feet below the existing ground surface. Any water encountered during excavation for foundation placement should be reported to the Geotechnical Engineer for evaluation.

5.9 Sinkhole Risk Reduction and Corrective Action

Based on our experience, we have found several measures useful in the design and site development to reduce the potential for sinkhole development at sites. These measures would decrease but not eliminate the potential for sinkhole development. Much can be accomplished to decrease the potential of future sinkhole activity by proper grade selection and positive site drainage.

The portions of the site excavated to achieve the desired grades will have a higher risk of sinkhole development than the areas to be filled, because of the exposure of the numerous relict fractures in the soil to rainfall and runoff. On the other hand, those portions of the site receiving a modest amount of fill will have a decreased risk of sinkhole development caused by rainfall or runoff because the placement of a cohesive soil fill over these areas effectively caps the area with a relatively impervious layer of remolded soil.

Although it is our opinion the risk of ground subsidence associated with sinkhole formation cannot be eliminated, we have found the following measures are useful in design and site development to reduce this potential risk:

- The scarification and recompaction of the upper nine inches of soil exposed in cut sections, thereby creating a blanket of less permeable material.
- Maintaining positive site drainage to route surface waters well away from structural areas both during construction and over the life of the structures. Control of surface water during construction and over the project life will be very important to reduce the potential for sinkhole development.
- Verifying subsurface piping structures is carefully constructed and pressure tested prior to its placement in service.
- Using water tight seals in the storm drainage system.
- Using compacted soil, compacted dense-graded aggregate, or flowable fill to backfill site utilities. The use of No. 57 stone as utility backfill should be avoided.



If a sinkhole develops, the appropriate corrective action is dependent on the size and location of the sinkhole. As described herein, S&ME should be retained to observe site and subgrade preparation activities. If sinkhole conditions are observed, the type of corrective action is most appropriately determined by S&ME on a case-by-case basis.

6.0 Additional Services

Once the final building and parking locations and grades are determined and structural loading information is available, S&ME should meet with the design team to determine if additional subsurface information is needed in the form of additional borings, observation trenches, or rock coring.

7.0 Limitations

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty, either express or implied, is made.

We relied on project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information if necessary.

Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

Unless expressly noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants, or the presence of any biological materials (mold, fungi, bacteria). If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested.

S&ME should be retained to review the final plans and specifications to confirm that earthwork, foundation, and other recommendations are properly interpreted and implemented. The recommendations in this report are contingent on S&ME's review of final plans and specifications followed by our observation and monitoring of earthwork and foundation construction activities.

Appendices

Appendix I – Figures



Notes:

- 1) Base map from Microsoft Corporation Earthstar Geographics accessed on October 26, 2021.




Site Vicinity Map

Geotechnical Investigation
 Norris Middle School Addition
 Norris, Tennessee

SCALE:	FIGURE NO.
Not to Scale	1
DATE:	
10-27-2021	
PROJECT NUMBER	
219068	



Legend:

 Approximate Location of Soil Test Borings

Notes:

- 1) Boring locations are shown in general arrangement only.
- 2) Do not use boring locations for determination of distances or quantities.
- 3) Base map from Microsoft Corporation Earthstar Geographics accessed on October 26, 2021.



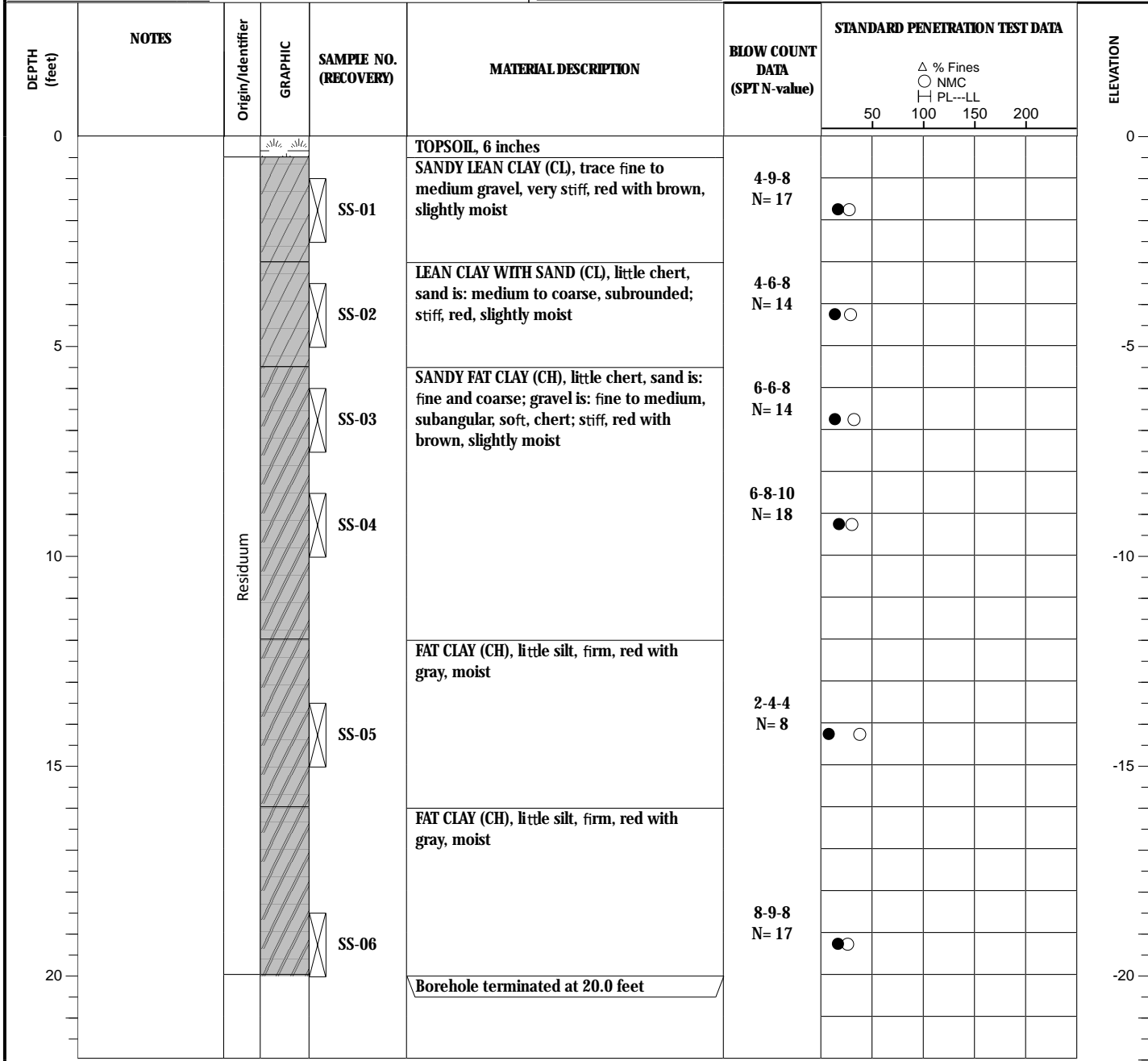
Boring Location Plan

Geotechnical Investigation
 Norris Middle School Addition
 Norris, Tennessee

SCALE:	FIGURE NO.
Not to Scale	2
DATE:	
10-27-2021	
PROJECT NUMBER	
219016	

Appendix II – Boring Logs

DATE DRILLED: 10/08/2021	ELEVATION:	NOTES:
DRILL RIG: Diedrich D-50	DATUM: NAVD88	
DRILLER: George Akins	BORING DEPTH: 20.0 ft	
HAMMER TYPE: Automatic hammer	CLOSURE: Cuttings with Hole Closure Device	
DRILLING METHOD:	LOGGED BY: Kenneth Kolesar	LATITUDE: LONGITUDE:
SAMPLING METHOD: SS	PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84)	

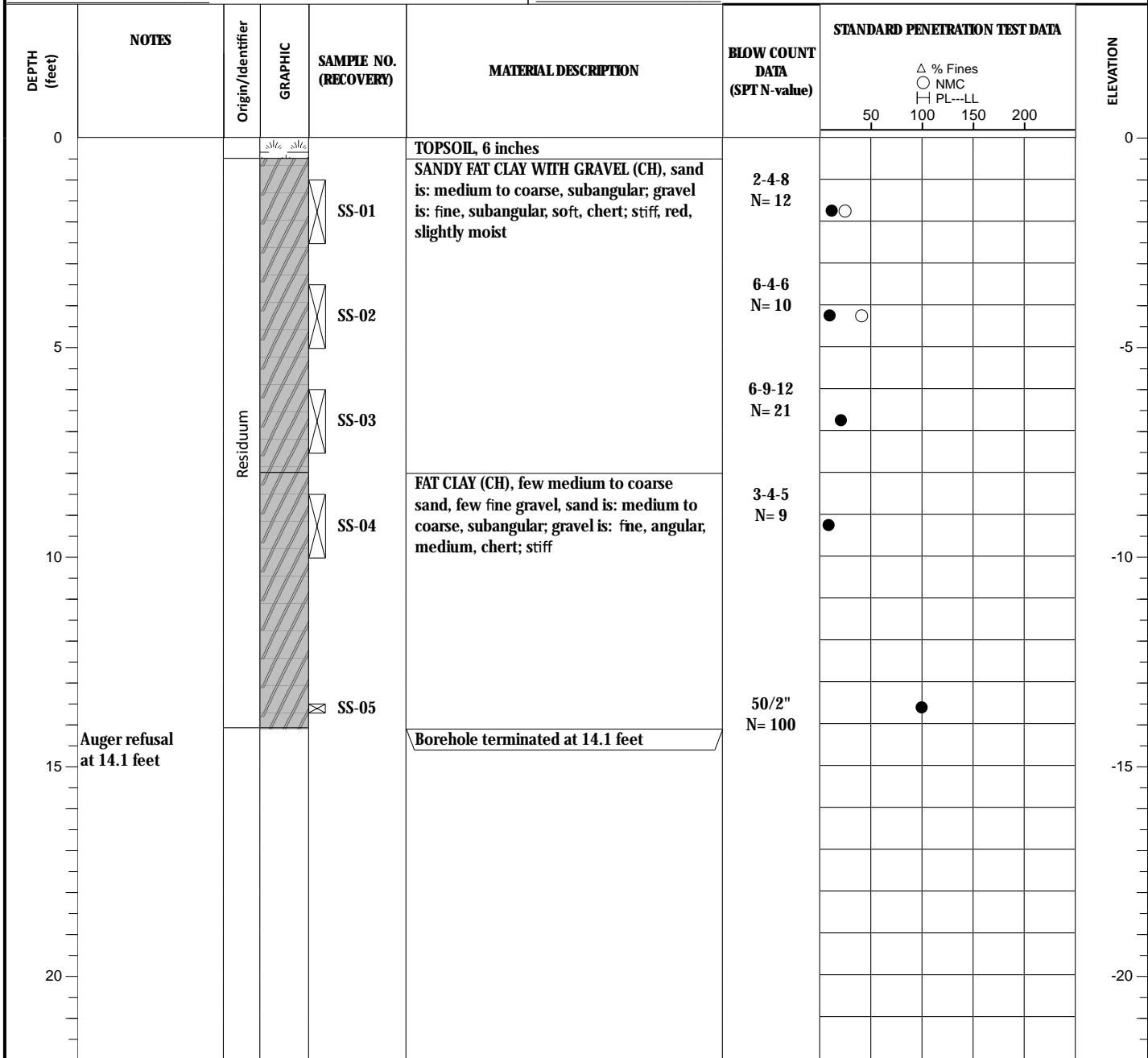


GROUNDWATER	DATE/TIME	DEPTH (FT)	REMARKS
ATD	☒		
END OF DRILLING	☒		
AFTER DRILLING	☒		
AFTER DRILLING	☒		



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL= Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), HC = Hole Cave

DATE DRILLED: 10/08/2021	ELEVATION:	NOTES:
DRILL RIG: Diedrich D-50	DATUM: NAVD88	
DRILLER: George Akins	BORING DEPTH: 14.1 ft	
HAMMER TYPE: Automatic hammer	CLOSURE: Cuttings with Hole Closure Device	
DRILLING METHOD:	LOGGED BY: Kenneth Kolesar	LATITUDE: LONGITUDE:
SAMPLING METHOD: SS	PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84)	

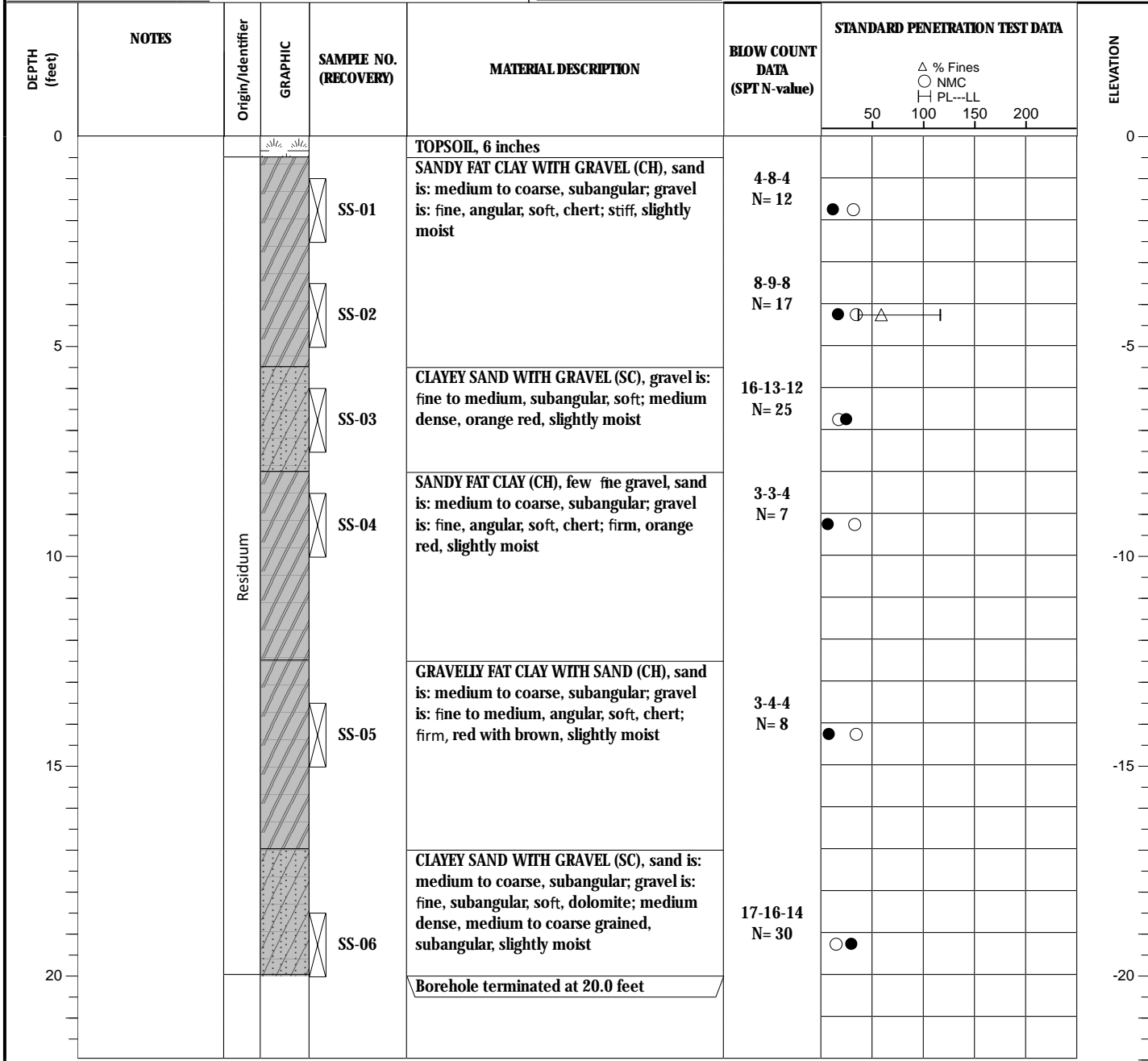


GROUNDWATER		DATE/TIME	DEPTH (FT)	REMARKS
ATD	☒			
END OF DRILLING	☒			
AFTER DRILLING	☒			
AFTER DRILLING	☒			



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
LL=Liquid Limit, PL= Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), HC = Hole Cave

DATE DRILLED: 10/08/2021	ELEVATION:	NOTES:
DRILL RIG: Diedrich D-50	DATUM: NAVD88	
DRILLER: George Akins	BORING DEPTH: 20.0 ft	
HAMMER TYPE: Automatic hammer	CLOSURE: Cuttings with Hole Closure Device	
DRILLING METHOD:	LOGGED BY: Kenneth Kolesar	LATITUDE: LONGITUDE:
SAMPLING METHOD: SS	PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84)	



GROUNDWATER	DATE/TIME	DEPTH (FT)	REMARKS
ATD	∇		
END OF DRILLING	∇		
AFTER DRILLING	∇		
AFTER DRILLING	∇		



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
 LL=Liquid Limit, PL= Plastic Limit, NMC = Natural Moisture Content, PPV = Pocket Penetrometer (tsf), PTV = Pocket Torvane (tsf), HC = Hole Cave

DATE DRILLED: 10/08/2021	ELEVATION:	NOTES:
DRILL RIG: Diedrich D-50	DATUM: NAVD88	
DRILLER: George Akins	BORING DEPTH: 10.0 ft	
HAMMER TYPE: Automatic hammer	CLOSURE: Cuttings with Hole Closure Device	
DRILLING METHOD:	LOGGED BY: Kenneth Kolesar	LATITUDE: LONGITUDE:

SAMPLING METHOD: SS PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude WGS 84

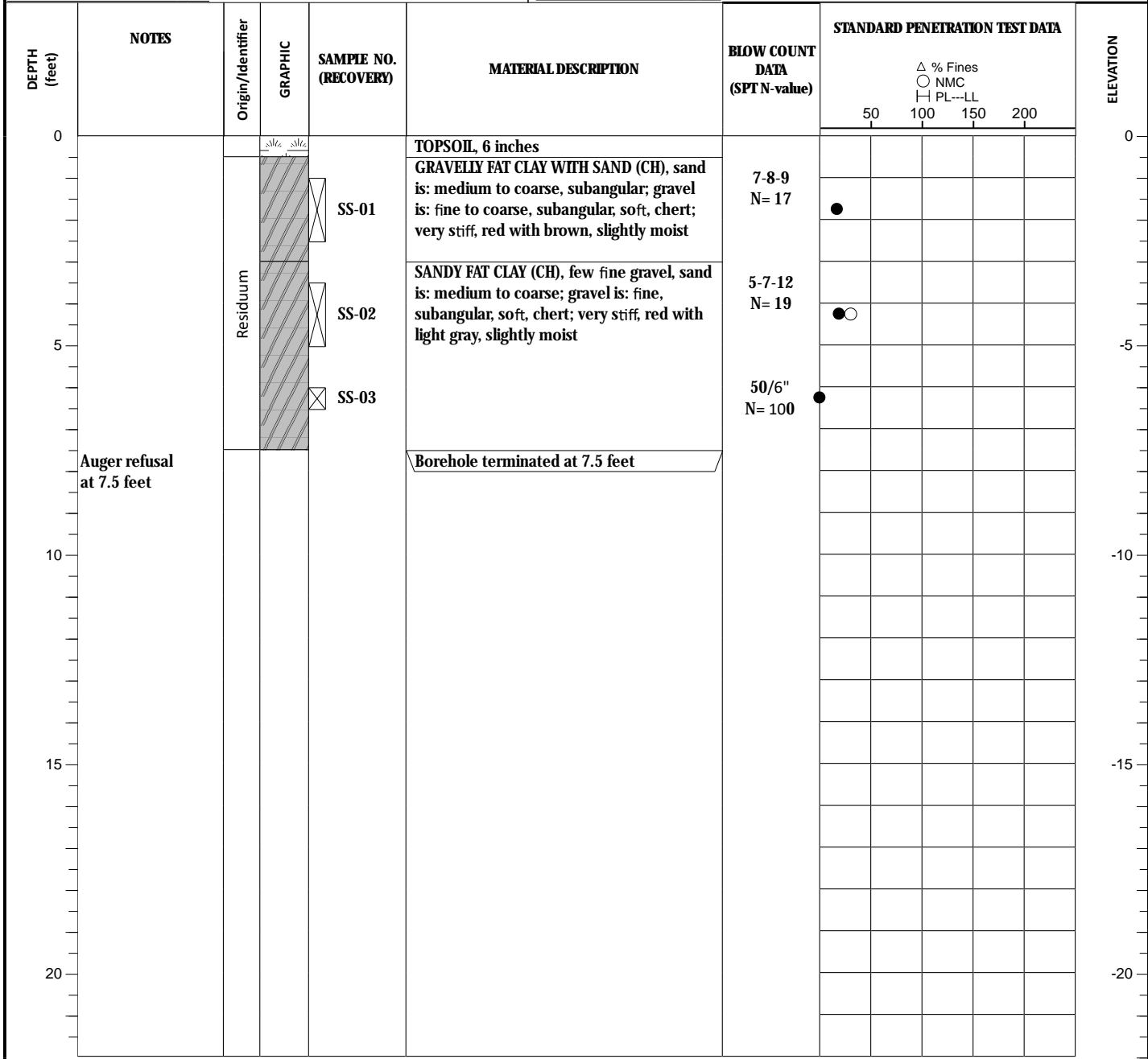
DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPTN-value)	STANDARD PENETRATION TEST DATA				ELEVATION	
							50	100	150	200		
0					TOPSOIL, 4.8 inches						0	
		Residuum		SS-01	SANDY FAT CLAY WITH GRAVEL (CH), gravel is: fine to medium, subangular, soft, chert; very stiff, red with brown, slightly moist	4-7-10 N= 17						
				SS-02			4-7-11 N= 18					
5				SS-03		GRAVELLY FAT CLAY WITH SAND (CH), gravel is: fine to coarse, subangular, hard, quartzite; stiff, red with gray brown, slightly moist	12-6-6 N= 12					
				SS-04		CLAYEY GRAVEL WITH SAND (GC), sand is: medium to coarse, subangular; gravel is: fine to coarse, subangular, medium dense, chert; medium dense, dark gray to gray, fine to coarse grained, subangular	4-6-6 N= 12					
10					Borehole terminated at 10.0 feet						-10	
15											-15	
20											-20	

GROUNDWATER	DATE/TIME	DEPTH (FT)	REMARKS
ATD	☒		
END OF DRILLING	☒		
AFTER DRILLING	☒		
AFTER DRILLING	☒		



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DATE DRILLED: 10/08/2021	ELEVATION:	NOTES:
DRILL RIG: Diedrich D-50	DATUM: NAVD88	
DRILLER: George Akins	BORING DEPTH: 7.5 ft	
HAMMER TYPE: Automatic hammer	CLOSURE: Cuttings with Hole Closure Device	
DRILLING METHOD:	LOGGED BY: Kenneth Kolesar	LATITUDE: LONGITUDE:
SAMPLING METHOD: SS PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84)		



GROUNDWATER	DATE/TIME	DEPTH (FT)	REMARKS
ATD	∇		
END OF DRILLING	∇		
AFTER DRILLING	∇		
AFTER DRILLING	∇		



GROUNDWATER DEPTHS ARE NOT EXACT AND MAY VARY SUBSTANTIALLY FROM THOSE INDICATED. ATD = AT TIME OF DRILLING
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DATE DRILLED: 10/08/2021	ELEVATION:	NOTES:
DRILL RIG: Diedrich D-50	DATUM: NAVD88	
DRILLER: George Akins	BORING DEPTH: 10.0 ft	
HAMMER TYPE: Automatic hammer	CLOSURE: Cuttings with Hole Closure Device	
DRILLING METHOD:	LOGGED BY: Kenneth Kolesar	LATITUDE: LONGITUDE:

SAMPLING METHOD: SS PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84)

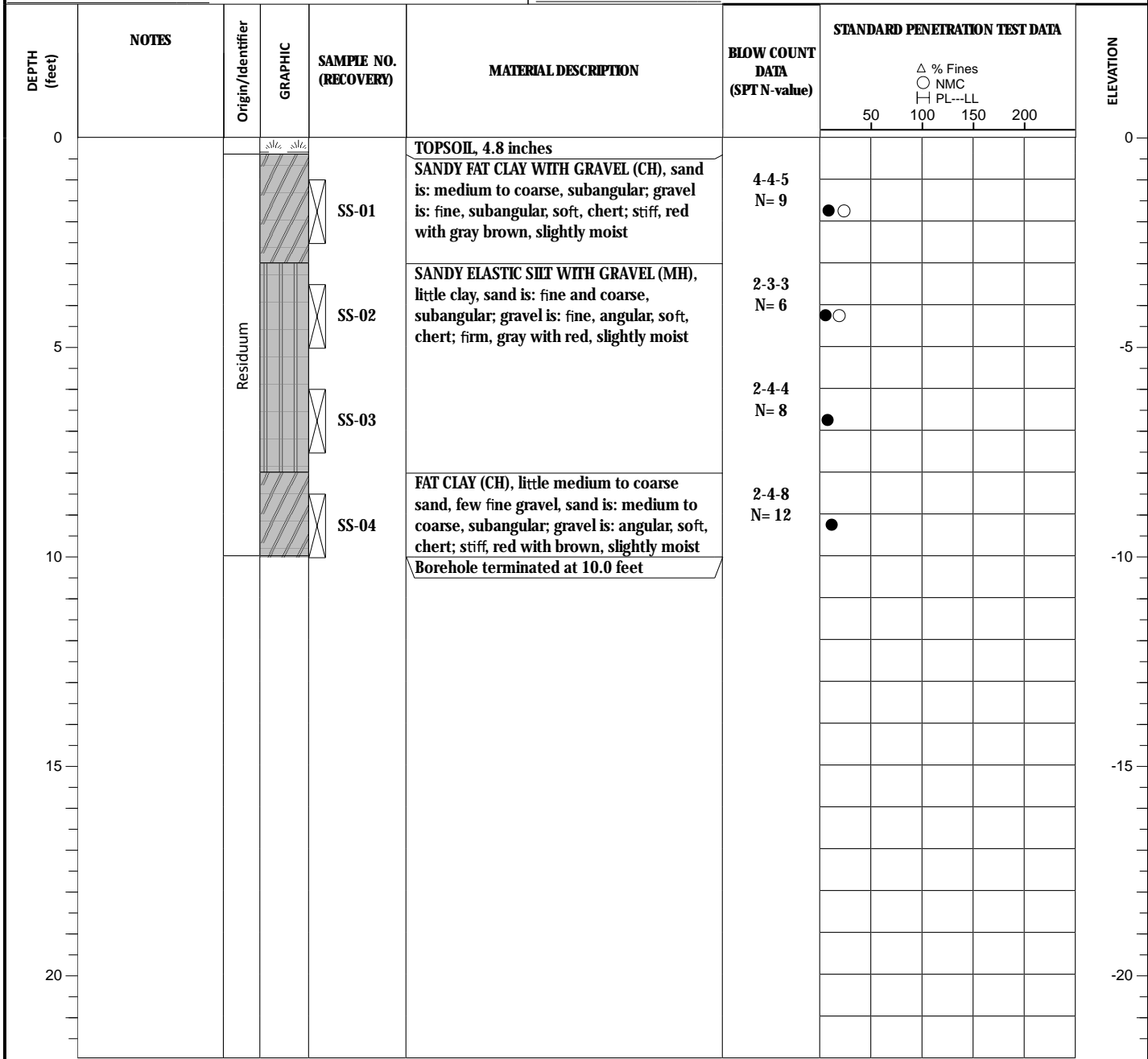
DEPTH (feet)	NOTES	Origin/Identifier	GRAPHIC	SAMPLE NO. (RECOVERY)	MATERIAL DESCRIPTION	BLOW COUNT DATA (SPT N-value)	STANDARD PENETRATION TEST DATA					ELEVATION	
							50	100	150	200			
0					TOPSOIL, 6 inches							0	
		Residuum		SS-01	SANDY FAT CLAY WITH GRAVEL (CH), sand is: medium to coarse, subangular; gravel is: fine to coarse, subangular, hard, chert; stiff, red with tan, slightly moist	8-9-7 N= 16	●						
				SS-02		7-6-8 N= 14	●○						
5				SS-03		8-9-5 N= 14	●						
				SS-04		SANDY FAT CLAY (CH), sand is: medium to coarse, subangular; gravel is: fine, subangular, hard, chert; stiff, red with brown, slightly moist	4-6-7 N= 13	●					
10					Borehole terminated at 10.0 feet							-10	
15												-15	
20												-20	

GROUNDWATER	DATE/TIME	DEPTH (FT)	REMARKS
ATD	∇		
END OF DRILLING	∇		
AFTER DRILLING	∇		
AFTER DRILLING	∇		



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DRILLING METHOD:	LOGGED BY: Kenneth Kolesar	LATITUDE: LONGITUDE:
SAMPLING METHOD: SS	PROJECT COORDINATE SYSTEM - World Geodetic System Longitude / Latitude (WGS 84)	



GROUNDWATER	DATE/TIME	DEPTH (FT)	REMARKS
ATD	☒		
END OF DRILLING	☒		
AFTER DRILLING	☒		
AFTER DRILLING	☒		



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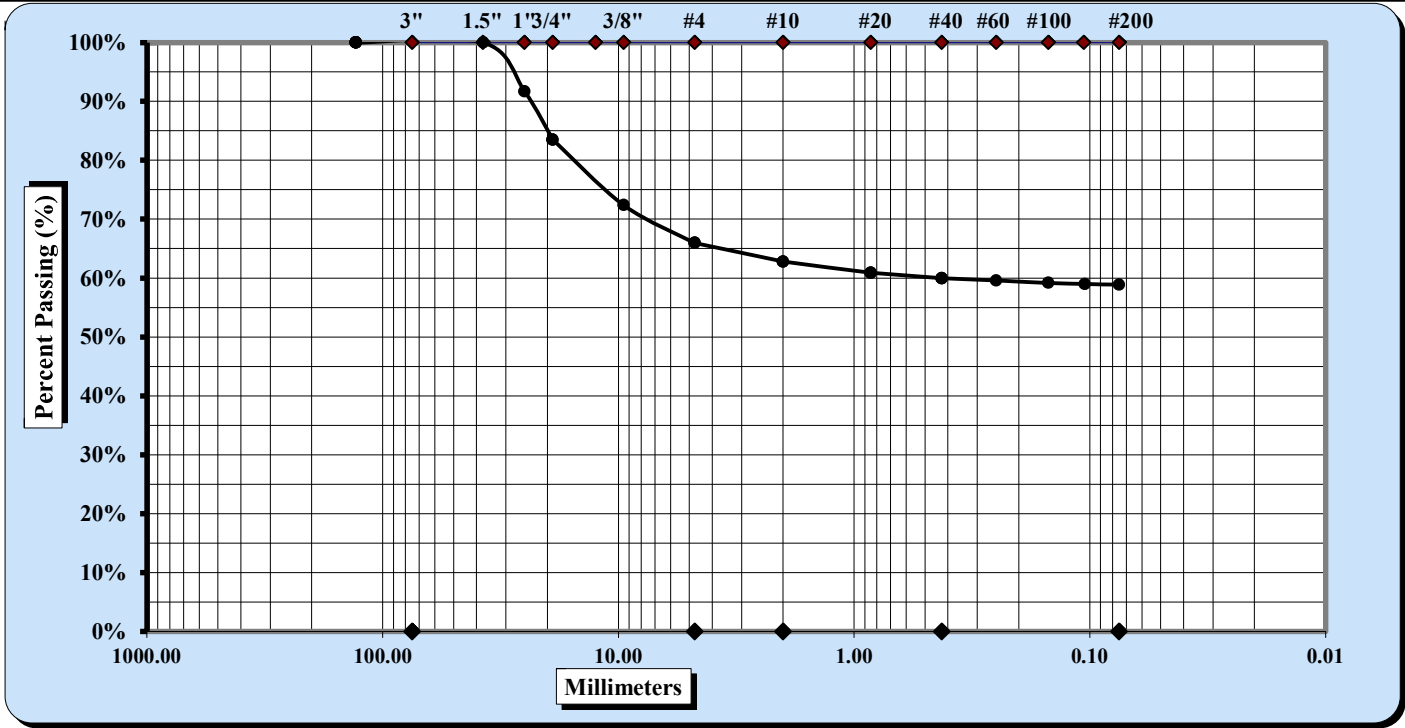
Appendix III – Laboratory Test Results

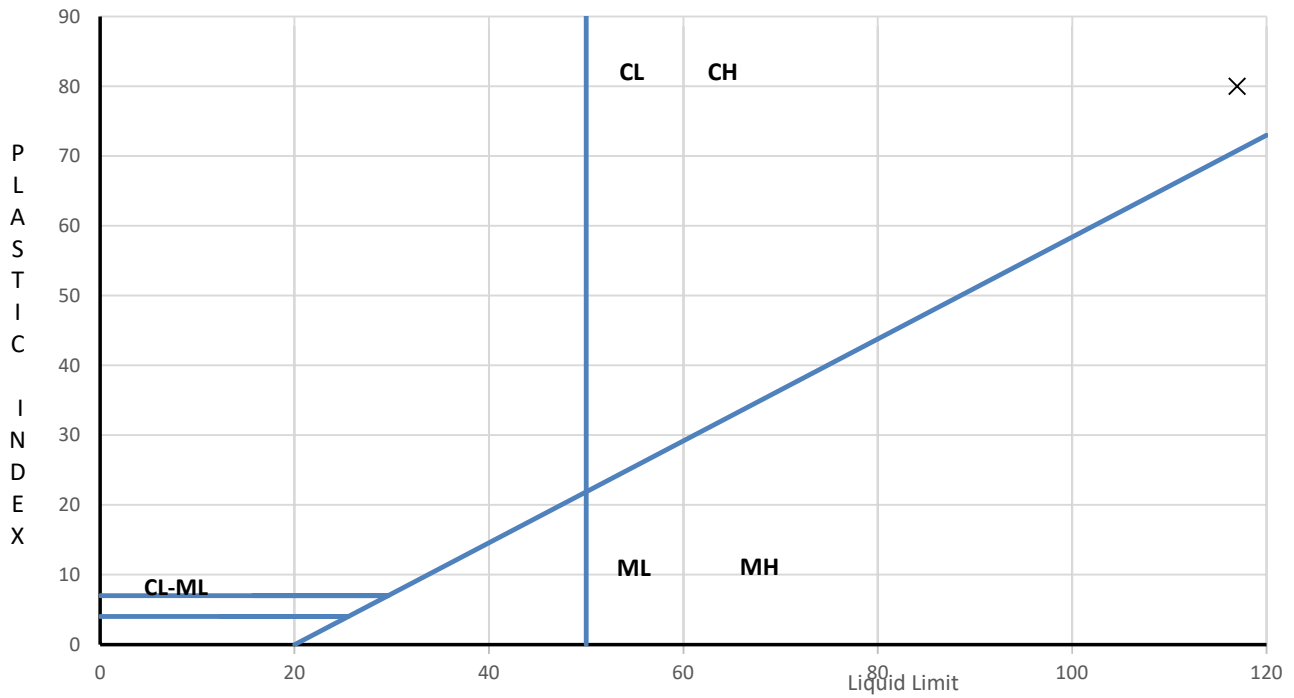


ASTM D6913: Standard Test Method for Sieve Analysis of Soils

Report Number	
Report Date	
Test Date	10/22/2021
Sample Date	

Project Number	219016		
Project Name	Norris Middle School Additions		
Client Name	MBI Companies		
Client Address			
KeyLAB ID	KNOX202110149	Sample Type	SS
Location ID	B-03	Sample Top Depth	3.5
Sample Reference	SS-02	Sample Base Depth	5
Classification	GRAVELLY FAT CLAY	Test Method	B





Specimen Identification			MC	LL	PL	PI	Fines	Classification (symbol is based on minus 40 material only when no grain size information is present.)	
ID	No.	Top Depth						Symbol	Name
B-01	SS-01	1	27.6						
B-01	SS-02	3.5	28.9						
B-01	SS-03	6	32.3						
B-01	SS-04	8.5	30.2						
B-01	SS-05	13.5	37.9						
B-01	SS-06	18.5	26.1						
B-02	SS-01	1	24.7						
B-02	SS-02	3.5	40.9						
B-03	SS-01	1	31.7						
X	B-03	SS-02	34.5	117	37	80	58.9	CH	GRAVELLY FAT CLAY
B-03	SS-03	6	17.3						
B-03	SS-04	8.5	33.0						
B-03	SS-05	13.5	34.4						
B-03	SS-06	18.5	14.8						
B-04	SS-01	1	27.8						
B-05	SS-02	3.5	30.2						
B-06	SS-01	1	20.3						
B-06	SS-02	3.5	22.8						
B-07	SS-01	1	23.7						
B-07	SS-02	3.5	19.0						

INDEX TEST RESULTS



Report No. KNOX_21000164
 Report Date 12/3/2021

Project Name	Norris Middle School Additions	
Project Number	219016	
Approved by	Date	
<i>Victoria Lopez</i>	10/22/2021 10:18	

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
 - 1. Section 01 10 00 – Summary: For restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
 - 2. Section 01 70 00 – Execution and Closeout Requirements: For cutting and patching procedures.

1.03 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.04 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.05 PREINSTALLATION MEETINGS

- A. Predemolition 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.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.
- C. 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.
- D. 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 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.
- E. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Submit before Work begins.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- G. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.07 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.08 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.09 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. If hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches (300 mm) or more.

- F. Storage or sale of removed items or materials on-site is not permitted.
- G. 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.

1.10 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding.
- B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.11 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

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

PART 3 EXECUTION

3.01 EXAMINATION

- A. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- B. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.
 - 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.

3.02 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.03 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off 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 on Drawings 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. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.04 PROTECTION

- A. Temporary Protection: 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 01 50 00 - Temporary Facilities and Controls.
- B. Temporary Shoring: Design, 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.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.05 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. 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 portable fire-suppression devices during flame-cutting operations.
 5. Maintain fire watch during and for at least <Insert number> hours after flame-cutting operations.
 6. Maintain adequate ventilation when using cutting torches.
 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 10. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 - Construction Waste Management and Disposal.
- B. 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.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

3.06 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."
- E. 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 weathertight. See Section <Insert Section number and title> for new roofing requirements.
1. Remove existing roof membrane, flashings, copings, and roof accessories.

2. Remove existing roofing system down to substrate.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 01 74 19 - Construction Waste Management and Disposal.
 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.
 4. Comply with requirements specified in Section 01 74 19 - Construction Waste Management and Disposal.
- B. Burning: Do not burn demolished materials.

3.08 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

PART I GENERAL

1.01 SCOPE:

- A. The extent of concrete work is shown on the drawings.

1.02 SUBMITTALS:

- A. 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 and sealing compounds, and others requested by the Architect.
- B. Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with the ACI 315, Details and Detailing of Concrete Reinforcement, showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Show on the shop drawings special reinforcement required and openings through concrete structures.
- C. Submit two (2) copies of laboratory test reports with standard deviation analysis or trial batch data. All concrete materials shall be listed.

1.03 QUALITY ASSURANCE:

- A. Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified.
1. ACI 301, Specifications for Structural Concrete for Buildings
 2. ACI 302, Guide for Concrete Floor and Slab Placement
 3. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
 4. ACI 305, Hot Weather Concreting
 5. ACI 306, Cold Weather Concreting
 6. ACI 315, Detailing Manual
 7. ACI 318, Building Code Requirements for Reinforced Concrete
 8. ACI 347, Recommended Practice for Concrete Formwork
 9. CRSI Manual of Standard Practice
 10. ACI 211.1 Standard Practice for Selecting proportions for Normal, Heavyweight, and Mass Concrete.
 11. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete.
- B. The Contractor is responsible for correcting concrete work that does not conform to the specified requirements, including requirements for strength, tolerances, and finishes.

1.04 QUALITY CONTROL AND TESTING:

- A. Materials and operations shall be inspected and tested as work progresses. Failure to detect defective work shall not prevent rejection when defect is discovered, nor shall it obligate the Owner for final acceptance.
- B. If indicated as required by Section 01 40 00 and/or 01 45 00, Special Inspectors shall meet the "Qualifications Standards of Inspectors and Testing Technicians" noted in the Statement of Special Inspections.
- C. Testing agencies shall meet the requirements of "Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction," ASTM E 329.
- D. The following testing service shall be performed by the designated party identified in Sections 01 40 00 and/or 01 45 00.
1. Secure composite samples in accordance with "Standard Method of Sampling Fresh Concrete," ASTM C 172.

2. Mold and cure three specimens from each test required in accordance with "Standard Method of Making and Curing Concrete Test Specimens in the Field," ASTM C 31.
 3. Test specimens in accordance with "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens," ASTM C 39. Two specimens shall be tested at 28 days for acceptance and one shall be tested at 7 days for information.
 4. Make one strength test for each 100 cu. yd. (76.5 m³) or fraction thereof, of each mix design of concrete placed in any one day.
 5. Determine slump of normal-weight concrete sample for each strength test in accordance with "Standard Test Method for Slump of Portland Cement Concrete," ASTM C 143.
 6. Determine total air content of normal-weight concrete sample for each strength test in accordance with "Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method," ASTM C 231 or "Standard Test Method for air content of freshly mixed concrete by the Volumetric Method," C-173.
 7. Determine temperature, unit weight, yield and air content (gravimetric) of concrete sample for each strength test in compliance with ASTM C 138, "Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete."
 8. If water is added at the site, the designated agency shall retest the concrete in accordance with "Standard Test Method for Slump of Portland Cement Concrete" plus whatever other tests the designated agency feels are necessary. No water will be added at the site without the approval of the designated agency.
 9. Qualification of proposed materials and the establishment of mix designs in accordance with "Building Code Requirements for Reinforced Concrete," ACI 318.
 10. Non-Compliant Test Reports: All test reports indicating non-compliance should be faxed immediately to all parties on the test report distribution list. Copies shall be on different colored paper.
 11. Test results will be reported to the Architect and Contractor in writing on the same day that the test is made. 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 the structure, design compressive strength at 28 days, concrete mix proportions and materials, and compressive breaking strength and type of break for both 7 day tests and 28 day tests.
 12. Perform additional tests of in-place concrete when test results indicate required strength level has not been achieved and/or other characteristics have not been attained in the structure, as directed by the Architect. The testing service may conduct tests to determine the adequacy of concrete by cored cylinders that comply with ASTM C42 or by such other methods as are directed by the Architect. Contractor shall pay for such tests and any additional testing that may be required when concrete is verified to be unacceptable.
 13. Employ, at the Contractor's expense, a testing laboratory to perform Flatness/Levelness Testing. Comply with ASTM E-1155-96, but provide a minimum of one line of sampling in two perpendicular directions through each structural bay.
 - a. Perform testing using a "Dipstick Profiler" within 72 hours of concrete placement.
 - b. Supplement Dipstick testing with use of 10 foot certified straight edge placed randomly on the floor. Floor surface shall not exceed 3/8" below edge of straight edge anywhere along its surface when ends are placed on adjacent high spots.
- E. To facilitate testing and inspection, the Contractor shall:
1. Furnish labor to assist testing agency in obtaining and handling samples at the job site.
 2. Advise testing agency in advance of operations to allow for the assignment of testing personnel and testing.
 3. Provide and maintain for the use of the testing agency adequate facilities for proper curing of concrete test specimens on the project site in accordance with ASTM C 31.

PART II PRODUCTS

2.01 FORM MATERIALS:

- A. Forms for Exposed Finish Concrete: Unless otherwise specified or shown on the drawings, construct formwork for exposed concrete surfaces with plywood, metal, metal framed plywood, or other panel type materials acceptable to the Architect in order to provide exposed surfaces that are continuous, straight, and smooth. To minimize the number of joints and to conform to the joint system shown on the drawings, furnish panels in the largest practicable sizes. Provide form material that is thick enough to withstand pressure of newly placed concrete without bowing or deflection.
- B. Forms for Unexposed Finish Concrete: For surfaces that will be unexposed in the finished structure, form concrete with plywood, lumber, metal, or other material acceptable to the Architect. If lumber is used, it shall be dressed on at least two edges and one side for tight fit.
- C. Automatic machine placement shall be used for curb placement. Submit revised mix design and laboratory test results that meet or exceed requirements for outdoor concrete. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete.

2.02 REINFORCING MATERIALS:

- A. Reinforcing Bar: ASTM A615, Grade 60.
- B. Welded Wire Fabric: ASTM A185, welded steel wire fabric.
- C. 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. Unless otherwise indicated on the drawings, use wire type bar supports complying with CRSI recommendations. Concrete brick, wood, construction debris and other organic material will not be acceptable. Comply with the following:
 - 1. For slabs on grade, where wetted base material will not support chair legs, use supports with sand plates or horizontal runners.
 - 2. Use Mesh-Ups plastic wire mesh supports as manufactured by Lotel, Baton Rouge, 800-535-8375 or equal product as manufactured by Grip Rite/PROLOK or Dayton Superior/Aztec.
 - 3. For concrete surfaces exposed to view, where leg supports are in contact with forms, provide supports with legs that are hot dip galvanized or protected by either plastic or stainless steel.

2.03 CONCRETE MATERIALS:

- A. Portland Cement: ASTM C150, Type I. Use only one brand of cement throughout the project, unless otherwise acceptable to the Architect.
- B. Normal Weight Aggregates: ASTM C33, or local aggregates that do not comply with ASTM C33, but that have been shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Architect.
- C. Fine aggregate: Clean, sharp, natural sand or crushed gravel when used for vehicular wearing surfaces. Manufactured sand may be used elsewhere provided the percentage passing a No. 200 sieve is less than 3%.
- D. Coarse Aggregate: Crushed stone conforming to ASTM C 33 standard specification for concrete aggregates that is clean, uncoated, and processed from natural rock or stone and that contains no clay, mud, loam, or foreign matter.
- E. Combined aggregate gradation for slabs and other designated concrete shall be 8% - 18% for large top size aggregates (1½ in.) or 8% - 22% for smaller top size aggregates (1 in. or ¾ in.) retained on each sieve below the top size and above the No. 100.

- F. Vapor Barrier: The vapor barrier shall be placed over prepared base material where indicated below slabs on grade. Vapor Barrier shall conform to ASTM E 1745, Class A. The membrane shall have a water vapor permeance rate on no greater than 0.01 perms when tested in accordance with ASTM E 1745 Section 7.1. Membrane shall have minimum tensile strength of 58 lbf and a Resistance to Puncture of 2600 grams in accordance with ASTM test standards. Vapor barrier shall be no less than **20 mil** thick in accordance with ACI 302.1R.
1. Available Product: Subject to compliance with requirements, products that are pre-approved for incorporation into Work are Stego Wrap (20 mil) Vapor Barrier by Stego Industries LLC, Perminator EVOH by W. R. Meadows or Dura-Skrim by Raven Industries.
- G. Water: clean, fresh, drinkable.
- H. Admixtures:
1. Water Reducing Admixture: Conforming to ASTM C494, Type A, Eucon WR-75, WR-91 or MR by the Euclid Chemical Company, Pozzoloth 322N or Polyheed 997 by Master Builders, or Plastocrete 161 by Sika Chemical Corporation.
 2. Water Reducing, Retarding Admixture: Conforming to ASTM C494, Type D, Eucon Retarder-75 by the Euclid Chemical Co., Pozzoloth 100XR by Master Builders, Plastiment by Sika Corp. or Daratard - 17 by WR Grace and Co.
 3. High Range Water Reducing Admixture: Conforming to ASTM C494, Type F or G, (Superplasticizer): Eucon 37, 1037 or Plastol 5000 by the Euclid Chemical Co. or Rheobuild 1000 or 716 by Master Builders or Sikament 686 by Sika Corp.
 4. Non-chloride Accelerator: Accelguard 80 by the Euclid Chemical Co. or Darex Set Accelerator by W.R. Grace or SikaSet NC by Sika Corp.
 5. Air Entraining Admixture: ASTM C260.
 6. Pozzolanic Admixtures: ASTM C618.
 7. Prohibited Admixtures: Calcium Chloride or admixtures containing more than 0.05% Chloride Ions are not permitted. Admixtures indicated as prohibited on drawings shall not be used whether or not they appear in the list above.
- I. Supplementary Cementitious Materials:
1. Fly Ash: ASTM C618, Type F: Ignition loss shall not exceed three (3) percent. Only one source of fly ash shall be used.
 2. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
 3. Fly ash shall be used at a maximum percentage rate of 25% of Portland Cement by weight and blast furnace slag at a maximum percentage rate of 40% of Portland Cement by weight. Do not use fly ash for concrete to receive hardeners. The exact amount selected shall be based on a successful test placement.

2.04 RELATED MATERIALS:

- A. Mineral Aggregate Base: Open graded stone conforming to ASTM No. 57

Sieve Size , Grading D	Total Percent by Weight, Passing Sieves
1-1/2 in. (37.5 mm)	100
1 in. (25 mm)	95-100
1/2 in. (12.5 mm)	50-80
No. 4 (4.75 mm)	0-10
No. 8 (2.36 mm)	0-5

- B. Waterstops shall be Vinylex RB6316H preformed PVC ribbed waterstop by Vinylex Corporation, Knoxville, Tennessee or equal by Greenstreak or Paul Murphy Plastics Co.

- C. Joint Filler: Provide preformed joint filler at slab expansion joints, joints between floor slabs and walls and other isolation joints. Provide one of the following:
1. Precompressed, impregnated open cell foam.
 2. Asphalt saturated fiberboard complying with ASTM D 1751
 3. Granulated cork between saturated felt or glass fiber felt complying with ASTM D1752 Type H.
- D. Curing Compounds:
1. Clear Curing and Sealing Compound (VOC Compliant, 350 g/l): Liquid type membrane-forming curing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class A, 25% solids content minimum. Moisture loss shall be not more than 0.40 Kg/m² when applied at 300 sf/gal. Manufacturer's certification is required. Subject to project requirements provide one of the following products: Super Diamond Clear VOX or Super Rez Seal VOX by The Euclid Chemical Co. or Vocomp-30 by W.R. Meadows or Lumiseal WB Plus by L&M Construction Chemicals Inc.
 2. Curing Compound (Strippable for use on slabs to receive direct applied finishes): The curing compound shall conform to ASTM C309. Provide Kurez DR VOX by The Euclid Chemical Co. or 1100 Clear Series by W. R. Meadows or L&M Cure R by L&M Construction Chemicals Inc.
 3. For concrete to receive a special concrete finish (i.e., staining, polishing, etc.), curing compounds called for in those specification sections, if any, shall take precedence over curing compounds specified herein solely for those areas to receive such finish.
- E. Bonding Compound: Provide polyvinyl acetate, rewettable type compound. Do not use in areas subject to moisture. Euco Weld by Euclid Chemical Co. or Weldcrete by Larsen or LiquidWeld by Sika Corp.
- F. Epoxy Adhesive: Where called for, compound shall be a 2 component, 100% solids, 100% reactive compound suitable for use on dry or damp surfaces.
- G. Non-shrink Grout: The grout shall conform to CRD-C621-80, "Corps of Engineers Specification for Non-shrink Grout". Euco NS by the Euclid Chemical Co. or Masterflow 713 by Master Builders or SikaGrout 212 by Sika Corp.
- H. High Flow Grout: Where high fluidity and/or increased placing time is required, use high flow grout. The factory pre-mixed grout shall conform to ASTM C1107, "Standard Specification for Packages Dry, Hydraulic-Cement Grout (Non-Shrink)." In addition, the grout manufacturer shall furnish test data from an independent laboratory indicating that the grout when placed at a fluid consistency shall achieve 95% bearing under a 18" x 36" base plate. Provide Hi-Flow Grout by The Euclid Chemical Co. or SikaGrout 328 by Sika Corp or MasterFlow 928 by Master Builders.
- I. Non-Oxidizing Metallic Hardener: The specified non-oxidizing metallic floor hardener shall be formulated, processed and packaged under stringent quality control at the manufacturer's owned and controlled factory. The hardener shall be a mixture of specially processed non-rusting aggregate, selected Portland cement and necessary plasticizing agents. Product shall be Diamond-Plate by The Euclid Chemical Co.
1. For concrete to receive a special concrete finish (i.e., staining, polishing, etc.), hardeners called for in those specification sections shall take precedence over hardeners specified herein solely for those areas to receive such finish.
- J. Mineral Aggregate Hardener: The specified mineral aggregate hardener shall be formulated, processed and packaged under stringent quality control at the manufacturer's owned and controlled factory. The hardener shall be a factory-blended mixture of specially processed graded mineral aggregate, selected Portland cement and necessary plasticizing agents. Product shall be Surfex by The Euclid Chemical Co. or MasterTop 100 by Master Builders.

1. For concrete to receive a special concrete finish (i.e., staining, polishing, etc.), hardeners called for in those specification sections shall take precedence over hardeners specified herein solely for those areas to receive such finish.
- K. Liquid Densifier/Sealer: The liquid densifier compound shall be a silicate based sealer which penetrates concrete surfaces, increases abrasion resistance and provides a “low-sheen” surface that is easy to clean and eases the problem of tire mark removal. Product shall have a minimum solids content of 20% of which 50% must be silicate. Provide Diamond Hard by The Euclid Chemical Company or Liqui-Hard by W.R. Meadows or Seal Hard by L&M Construction Chemicals Inc. or SikaFloor 3S by Sika Corp.
1. For concrete to receive a special concrete finish (i.e., staining, polishing, etc.), densifiers/sealers called for in those specification sections shall take precedence over densifiers/sealers specified herein solely for those areas to receive such finish.
- L. Integral Color Dye for Exterior Application: Colored concrete system by L.M. Scofield Company or equal approved prior to bidding, having the following characteristics:
1. Admixture shall be a colored, water-reducing, admixture containing no calcium chloride with coloring agents that are limeproof and ultra-violet resistant.
 2. Colored admixture shall conform to the requirements of ACI 303.1, ASTM C979, ASTM C494 and ASSHTO M194.
 3. Curing compound shall comply with ASTM C309.
 4. Color: To be selected by Architect from manufacturer’s standard chart.
- M. One Part Repair Topping: Latex and microsilica modified cementitious mortar designed for use as a floor or deck topping at thicknesses of 1/16” to 3/8”. Product shall be Thin-Top Supreme by Euclid Chemical Co. or SikaTop 122 Plus by Sika Corp. for thicknesses up to 2”. Product shall be Concrete-Top Supreme by Euclid Chemical Co. or SikaTop 121 Plus by Sika Corp.
- N. Underlayment Compound: Free-flowing, self-leveling, pumpable cementitious base compound, “Super Flo-Top” by The Euclid Chemical Co. or SikaLevel 315 by Sika Corp or Level Set 300 by TEC. The compound shall exhibit the following properties:
- | | |
|----------------------------------|---|
| Compressive Strength (ASTM C109) | - 4400 PSI @ 7 days
- 5000 PSI @ 28 days |
| Bond Strength (ASTM C1042) | - 700 PSI @ 7 days
- 1000 PSI @ 28 days |
- 2.05 MISCELLANEOUS MATERIALS:
- A. Fill concrete spandrel blocks with concrete and reinforce with two (2) No. 4 bars to form cap beams at top of all masonry walls unless noted otherwise.
 - B. Fill steel pan stair risers and landings with non-slip concrete, poured in place and reinforced with 2" diamond mesh lath or fiber mesh. The fill shall consist by volume of 1 part Portland cement, 1-1/2 parts sand and 3 parts pea gravel. Fill shall have a smooth steel trowel finish.
 - C. Provide 2’-6” x 2’-6” corner bars of same size and number as footing reinforcing in all foundation corners unless noted otherwise.
 - D. Concrete slabs on grade at dumpster pads and equipment pads shall be 6 inch concrete reinforced with WWF 6 x 6 – W2.9 x W2.9 over 4 inches of crushed stone unless noted otherwise on the drawings.

2.06 MIX DESIGN:

A. Preparation

1. Prepare design mixes for each type and strength of concrete in accordance with ACI 318, "Building Code Requirements for Structural Concrete," Section 5.3 and with applicable provisions of ASTM C94. Submit written reports of each proposed mix for each class of concrete on the Mix Design Submittal Form included at the end of this specification at least 15 days before the start of work.
2. Provide special mix design for use with automatic machine placement of curbs.
3. The design mix shall provide normal weight concrete with 28 day compressive strength as indicated on the drawings or as shown below if not otherwise indicated.

B. Admixtures

1. All concrete shall contain the specified water reducing admixture or high-range water-reducing admixture. All concrete slabs placed at air temperatures below 50° F shall contain the specified non-chloride accelerator. All concrete required to be air entrained shall contain an approved air entraining mixture. All pumped concrete and concrete with a W/cm of less than 0.50 shall contain the specified high-range water-reducing admixture.
 - a. Use an air entraining admixture in all concrete structures and slabs exposed to freezing and thawing or subjected to hydrostatic pressure:

2.5% to 5.5% for maximum 2 inches aggregate
4.5% to 7.5% for maximum 3/4 inch aggregate
5.5% to 8.5% for maximum 1/2 inch aggregate
 - b. All trowel finished interior slabs: Maximum air content of 3% (do not add air entraining admixture).
2. Water/Cement Ratio:
 - a. Concrete exposed to freezing and thawing: 0.50
 - b. Concrete subject to deicers and/or required to be watertight: 0.45
 - c. Concrete subject to brackish water or salt spray: 0.40
 - d. Interior trowel finished slabs subject to vehicular traffic: 0.53
 - e. All other concrete: 0.58
3. Use the amounts of admixtures recommended by the manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities and types of admixtures as required to maintain quality control.

2.07 SELECTION OF PROPORTIONS:

A. General:

Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, water, admixtures, and as specified, Air Entraining Admixture. Proportions of ingredients shall produce concrete that will work readily into corners and angles of forms, bond to reinforcement, without segregation or excessive bleed water forming on the surface. Proportions of materials shall be in accordance with ACI 211.1, "Recommended Practice for Selecting Proportions for Normal, Heavy and Mass Weight Concrete."

1. Proportions of ingredients shall be selected by past field experience or, in lieu of past performance, laboratory trial mixes to produce placeability, durability, specified strength and properties specified.

B. Required Average Strength Above Specified Strength:

Determinations of required average strength (f 'c) shall be in accordance with ACI 318, "Building Code Requirements for Reinforced Concrete," and evaluations of compressive strength results of field concrete shall be in accordance with ACI 214, "Recommended Practice for Evaluation of Strength Test Results of Concrete."

1. Past Field Experience - Proportions shall be established on the actual field experience of the ready-mix producer with the materials proposed to be employed. Standard deviations shall be determined by 30 consecutive tests (or two groups of tests totaling 30 or more).

a. Average strength (f 'c) shall exceed specified strength (f 'c) by at least:

400 psi (2.8 MPa)	-	standard deviation is less than 300
550 psi (3.8 MPa)	-	standard deviation is 300 to 400
700 psi (4.8 MPa)	-	standard deviation is 400 to 500
900 psi (6.2 MPa)	-	standard deviation is 500 to 600
1200 psi (8.3 MPa)	-	standard deviation is above 600 or unknown

2. Trial Mixes - When the ready-mix producer does not have a record of past performance, the combination of materials and the proportions selected shall be selected from trial mixes having proportions and consistencies suitable for the work based on ACI 211.1-91, using at least three different water-cement ratios which will produce a range of strengths encompassing those required.

a. Average strength (f 'c) required shall be:

Specified compressive strength	--	Required average compressive strength
Less than 3000 (f 'c psi)	--	f 'c + 1000 (f 'c psi)
3000 to 5000 (f 'c psi)	--	f 'c + 1200 (f 'c psi)
Over 5000 (f 'c psi)	--	f 'c + 1400 (f 'c psi)

2.08 CONCRETE QUALITIES REQUIRED:

A. Specified Compressive Strength:

Specified Compressive (f 'c) Strength @ 28 days, unless noted higher on the drawings, shall be:

3000 psi (21 MPa) – Interior floor slabs (< 6” thick) with applied finishes and footings.

4000 psi (28 MPa) – Interior floor slabs (> or equal to 6” thick)

4000 psi (28 MPa) – Walks, curbs, columns, beams and other concrete exposed to the weather.

B. Slump:

1. Consolidation by vibration: 3 in. (76 mm) not to exceed 4 in. (102 mm).

2. Consolidation by other methods: 4 in. (102 mm) not to exceed 5 in. (127 mm).

3. Placement and consolidation by automatic machine: Slump as required by mix design.

a. Any concrete containing high-range water-reducing admixture (superplasticizer) shall have a maximum slump of 9” unless otherwise approved by the Architect. The concrete shall arrive at job site at a slump of 2” to 3”, (3” to 4” for concrete receiving a “shake-on” hardener or lightweight concrete), be verified, then high-range water-reducing admixture added to increase slump to approved level. All other concrete shall have a maximum slump of 4.”

b. Slump shall be determined by ASTM C 143-78, "Standard Test Method for Slump of Portland Cement Concrete."

- C. "Quick Dry" Concrete: Maximum W/cm – 0.40, superplasticized, 3% maximum air content. The floor finish shall be as required by the manufacturer of the specified floor coating or covering.
- D. Aggregate Size: Maximum size of coarse aggregate shall not exceed:
1. One-fifth narrowest dimension between forms.
 2. Three-fourths minimum clear spacing between reinforcing bars.
 3. One-third the thickness of slabs.
 4. Use 1½" top size in all trowel finished interior slabs-on-grade subject to vehicular traffic.
- 2.09 CONCRETE CLEANERS:
- A. Citrus based industrial degreaser and detergent. Acceptable products include:
1. AC-4450 ORANGE NATURAL 20 CONCENTRATE as distributed by Interstate Products Inc. 800-474-7294
 2. Commercial Strength Contractor's Solvent as manufactured by Orange-Sol Industrial Products Inc. 800-279-8822
 3. De-Solv-It Heavy Duty 24 as manufactured by Orange-Sol Industrial Products Inc. 800-279-8822

PART III EXECUTION

3.01 PRE-CONCRETE CONFERENCE:

- A. At least 35 days prior to start of the concrete construction schedule, the contractor shall conduct a meeting to review the proposed mix designs and to discuss the required methods and procedures necessary to achieve the required concrete quality. Contractor shall send a pre-concrete conference agenda to all attendees 20 days prior to the scheduled date of the conference.

3.02 PREPARATION FOR SLABS ON GRADE:

- A. Subgrade: Before any base material is installed, compact the subgrade of the area to be paved to 100% of optimum density as determined by ASTM D698 (Standard Proctor).
- B. Base: Install a mineral aggregate base of the type specified above in accordance with Section 303 of the TDOT specifications.
- C. The base must not depress more than 1/2" under a fully loaded ready-mix concrete truck.

3.03 FORMWORK:

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301.
- B. Use metal form ties that are factory made, adjustable in length, designed to prevent form deflection, and either removable or snap-off and that will prevent the concrete surface's being spalled when the ties are removed. If snap-off ties are used, the portion remaining within the concrete after removal must be at least 1-1/2 inches inside the concrete unless the drawings indicate otherwise.
- C. Provide openings in concrete formwork to accommodate the work of other trades. Determine the size and location of openings, recesses, and chases from the trades providing such work. Accurately place and securely support items built into forms.
- D. Clean thoroughly forms and adjacent surfaces that are to receive concrete. Remove chips, wood, sawdust, dirt, and any other debris just before the concrete is placed. After concrete placement, retighten forms if necessary to eliminate mortar leaks.

3.04 PLACING VAPOR BARRIER:

- A. Install vapor barrier in accordance with ASTM E1643.

- B. Arrange layout of vapor barrier to minimize seams and penetrations.
- C. Unroll vapor barrier over compacted aggregate base.
- D. Overlap all seams a minimum of six inches and seal with tape.
- E. All penetrations must be sealed using a combination of seam tape and mastic in accordance with manufacturer's latest printed instructions.
- F. Turn vapor barrier up at edge of slab to masonry wall juncture to provide bond break.

3.05 PLACING REINFORCEMENT:

- A. For details and methods of placing reinforcement and supports, comply with the specified codes and standards, the recommended practice of the CRSI as outlined in "Placing Reinforcing Bars," and these specifications.

3.06 INSTALLATION OF WATERSTOPS:

- A. Provide continuous waterstops and install waterstops in concrete joints where indicated.
- B. Carry waterstops in walls into lower slabs and join to waterstops in slabs with appropriate fittings.
- C. In water bearing structures, provide waterstops in all joints, whether or not indicated on drawings.
- D. Secure waterstops accurately to position and line as indicated on the drawings using factory installed hog rings or factory pre-punched holes in the outermost rib with tie wire. Do not drive nails, screws, or other fasteners through the waterstop at any time at any location.
- E. Secure at intervals of not more than 15 inches to prevent movement during the pour of concrete.
- F. Terminate waterstops 3 inches from the top of finished surfaces of walls and slabs, unless otherwise specified on the drawings.

3.07 CONCRETE PLACEMENT:

- A. Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast in.
- B. Use mechanical vibrating equipment, including a laser screed, supplemented by hand spading, rodding, or tamping to consolidate placed concrete. The equipment and procedures used to consolidate the concrete shall comply with the recommended practices of ACI 309 and suit both the type of concrete and project conditions.
- C. Until the placing of a panel or section is completed, deposit and consolidate concrete slabs in a continuous operation within construction joints.
- D. Consolidate concrete during placing operations so that it is thoroughly worked around reinforcement and other embedded items and into corners.
- E. Bring slab surfaces to the correct level with a straightedge and strike off. Use appropriate bull floats or straightedges to smooth the surface, leaving it free from humps and hollows. Do not sprinkle water on the plastic surface. Do not disturb the slab surfaces before starting finishing operations.
- F. Maintain reinforcement in the proper position during placement operations.
- G. Cold Weather Placement: Comply with ACI 306 and the requirements therein specified to protect concrete work from physical damage or reduced strength due to frost, freezing, or low temperatures.

- H. Hot Weather Placement: When the weather is hot enough to impair the concrete's quality and strength, place the concrete as specified herein and in ACI 305.

3.08 JOINTS:

- A. Locate and install construction joints (which are not shown on the drawings) as approved by the Architect so that the strength and appearance of the structure will not be impaired.
- B. Provide keyways at least 1-1/2 inches deep in construction joints that are in walls and slabs or between walls and footings. Bulkheads designed for this purpose may be used if accepted by the Architect. Construction joints, in slabs subjected to vehicular traffic, shall have round, square or diamond dowels as indicated on the drawings.
- C. Place construction joints perpendicular to the main reinforcement. Continue all reinforcement across construction joints of structural members.
- D. Construct isolation joints in slabs on the ground wherever there is contact between slabs on the ground and vertical surfaces and wherever else indicated on the Drawings.
- E. Contraction (control) joints in slabs on ground as shown on the Drawings shall have a maximum spacing of 30 times slab thickness (up to a maximum of fifteen (15) feet) each way if not shown otherwise.
- F. Saw-Cut Control Joints:
1. Primary Method: Soff-Cut System method, by Soff-Cut International, Corona, CA, 800-776-3328. Finisher must have documented successful experience in the use of this method prior to this project. Install cuts within 2 hours after final finish at each saw cut location. Use 1/8 inch thick blade, cutting 1-1/4 inch into slab.
 2. Optional Method (Where Equipment is Not Available for Primary Method): Properly time cutting with the set of the concrete. Saw-cut control joints within 12 hours after finishing. Start cutting as soon as the concrete has hardened sufficiently to prevent aggregates being dislodged by the saw. Complete cutting before shrinkage stresses become sufficient to produce cracking. Use 1/4 inch thick blade, cutting 1/4 slab depth.

3.09 FINISH OF FORMED SURFACES:

- A. Finishes to be in accordance with ACI 301.
- B. Trowel Finish: Apply a trowel finish to all interior slab surfaces unless otherwise noted on drawings. Concrete shall be placed, consolidated, struck-off and leveled to proper elevation using a laser screed, or vibratory screed. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots with highway straightedge. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture. Surface shall achieve an F(F) 20 – F(L) 17 tolerance. Surface shall then be troweled, at least twice, to a smooth dense finish, free of trowel marks, uniform in texture and appearance, and achieve a tolerance of F(F) 25 and F(L) 20 minimum overall composite and F(F) 17 and F(L) 15 minimum at any individual section measured according to ASTM E 1155. For floors to receive an applied floor covering, grind smooth any surface defects that could telegraph through applied floor covering or repair as necessary with specified repair compound or underlayment to achieve specified tolerance. For finishes in which the concrete surface is exposed to view, grinding or reparations involving compounds or underlayments are not acceptable and shall not be used to achieve specified floor tolerances.
- C. Non-Oxidizing Metallic Floor Hardener: All slabs, in areas subject to vehicular traffic including all loading dock areas and any other areas noted on drawings, shall receive an application of non-oxidizing, metallic floor hardener applied at a rate of 1.5 lbs/ft². Immediately following first floating operation, uniformly distribute approximately 2/3 of required weight of non-oxidizing metallic floor hardener over concrete

surface, by mechanical spreader, and embed by means of power floating. Hardener shall be floated in and second application made. Surface shall be floated again to properly bond hardener to base concrete slab. Surface shall then be troweled, at least twice, to a smooth dense finish.

- D. Mineral Aggregate Hardener: All slabs, in areas noted on drawings, shall receive an application of mineral aggregate hardener applied at a rate of 1.2 lbs/ft². Hardener shall be applied in two applications by mechanical spreader. First shake shall comprise 2/3 of specified amount of hardener. This application shall be made after initial floating operation unless climatic conditions dictate earlier application. Hardener shall be floated in and second application made. Surface shall be floated again to properly bond hardener to base concrete slab. Surface shall then be troweled, at least twice, to a smooth, dense finish.
- E. Non-slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, and ramps and elsewhere as indicated by the drawings or schedules. Texture shall be as approved by Architect from sample panels.
- F. Liquid Densifier/Sealer Finish: Apply this compound on exposed interior floors subjected to vehicular abrasion and shake on hardener slabs as indicated on the drawings. Application shall be made in strict accordance with directions of the manufacturer and just prior to completion of construction. Spray, squeegee or roll on liquid densifier to clean, dry concrete surface. Liquid should be scrubbed into surface with mechanical scrubber. Keep the surface wet with the densifier during the application process. When product thickens, but not more than 60 minutes after initial application, surface shall be squeegeed or vacuumed to remove all excess liquid
- G. Sealer/Dustproofer Finish: Apply a second coat of the specified curing and sealing compound to interior concrete floors where shown on the drawings or in schedules to be sealed concrete. The compound shall be applied in strict accordance with the directions of the manufacturers and just prior to completion of construction.

3.10 CURING:

- A. After placing and finishing the concrete, start initial curing as soon as free water has disappeared from concrete surface. Keep continuously moist for not less than 7 days and above 50° F. When high early strength concrete is used, the temperature requirement may be reduced to three days.
- B. Begin final curing immediately after initial curing and before the concrete has dried. Continue final curing in accordance with ACI 301. Avoid rapid drying at the end of the final curing period.
- C. All exposed interior slabs, not receiving a liquid densifier, and troweled slabs receiving mastic applied adhesives or "shake-on" hardeners shall be cured with the specified curing and sealing compound. Exterior slabs, sidewalks, curbs, and architectural concrete, not receiving a penetrating sealer, shall be cured with the specified clear, non-yellowing curing and sealing compound. Maximum coverage shall be 400 ft²/gallon on steel troweled surfaces and 300 ft²/gallon on floated or broomed surfaces for the curing/sealing compound.
- D. Curing Compound (Strippable): Use the specified strippable curing compound on surfaces to be covered with finish or coating material applied directly to concrete, such as liquid densifier/sealer, waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials. Apply in accordance with manufacturer's instructions.

3.11 MISCELLANEOUS CONCRETE ITEMS:

- A. Filling In: Unless the drawings show otherwise or the Architect directs, fill in holes and openings left in concrete structures for the work of other trades once that work is in place. Mix, place, and cure concrete as specified herein to blend with in-place construction. Provide other miscellaneous concrete filling shown on the drawings or necessary to complete the work.

- B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on the drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with the certified diagrams or templates of the manufacturer furnishing the machines and equipment.
- C. Nonshrink Grout: Grout base plates and foundations as indicated using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.
 - 1. Where high fluidity and/or increased placing time is required use the specified high flow grout. This grout shall be used for all base plates larger than 10 square feet.

3.12 EVALUATION AND ACCEPTANCE:

- A. 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.
- B. **No cracks which affect structural integrity will be accepted.** Affected areas to be removed and replaced. Submit repair plan to structural engineer for approval before beginning repairs
- C. Cracks which do not affect structural integrity:
 - 1. Cracks consistently greater than 1/4" in width will not be accepted, remove and replace section to nearest existing joint.
 - 2. Cracks showing vertical separation of plane will not be accepted remove and replace section to nearest existing joint.
 - 3. Cracks less than 1/4" in width, occurring in appearance sensitive areas (i.e. front entry, front sidewalk, etc.), may require replacement. Final decision resides with the Owner.
 - 4. Cracks less than a 1/4" in width in non-appearance sensitive areas will be filled with Bonsal vinyl concrete repair compound, or approved equal, following manufacturer's recommended application procedures.

3.13 WALKS AND CURBS:

- A. Walks and sidewalks shall be not less than 4" thick, placed over a 4" layer of porous fill as specified, and marked off with surface joints at 6'-0" o.c. as shown. Install expansion joints between walks and building, at changes in walk direction, at 30'-0" o.c., and elsewhere as shown. Expansion joints shall be formed with 1/2" thick preformed filler.
- B. Curbs shall be constructed to size and profile shown, placed over binder course of paving. Provide expansion joints at 50 feet on center maximum.
- C. All edges, joints and margins shall be straight and true and rounded with jointing and edging tools.
- D. Walks shall be sloped 1/4" per foot.

3.14 REPAIR OF DEFECTIVE AREAS

- A. With prior approval of method and procedure by the Engineer, all repairs of defective areas shall conform to ACI 301, Section 5.3.7, except that the specified bonding compound must be used.
- B. Leveling of floors for subsequent finishes shall be achieved by use of the specified underlayment material.
- C. All exposed floors shall be leveled, where required, with the specified self-leveling repair topping.
- D. Repair methods not specified above may be used, subject to acceptance of Engineer.

3.15 CLEANING AND PROTECTION:

- A. Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.
- B. Protect cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.
- C. Clean cast-in-place architectural concrete surfaces after finish treatment to remove stains, markings, dust, and debris. Use power washer set to low pressure (800 psi maximum) with orange cleaner/degreaser to clean all exposed exterior concrete.
- D. Wash and rinse surfaces according to concrete finish applicator's recommendations and cleaning solutions written instructions. Protect other Work from staining or damage due to cleaning operations.
- E. Do not use cleaning materials or processes that could change the appearance of cast-in-place architectural concrete finishes.

END OF SECTION

CONCRETE MIX DESIGN SUBMITTAL FORM

Project: _____
 City: _____
 General Contractor: _____
 Concrete Contractor: _____
 Concrete Strength (Class): _____
 Use (describe): _____

Design Mix Information

Please check one

Based on Standard Deviation Analysis
 Trial Mix Test Data

Design Characteristics:

Density pcf
 Strength psi (28 day)
 Air % specified

*If trial mixes are used the Mix Design is proportioned to achieve $f'_{cr} = f'_c + 1200$ psi
 (1400 psi for strength higher than 5000 psi at 28 days)*

<u>MATERIALS</u>	<i>Type/ Source</i>	<i>Specific Gravity</i>	<i>Weight/lb.</i>	<i>Absolute Vol. cu.ft.</i>
Cement				
Flyash				
Microsilica				
Coarse Aggregate				
Fine Aggregate				
Water				
Air				
Other				
TOTAL				27.0 cu. ft.

* Water/Cement Ratio (lbs. water/lbs. cement) = _____%

<u>ADMIXTURES</u>	<i>Manufacturer</i>	<i>Dosage oz/cwt</i>
Water Reducer		
Air Entraining Agent		
High Range Water Reducer		
Non-Corrosive Accelerator		
Other		

Slump before HRWR _____ inches
 Slump after HRWR _____ inches

Standard Deviation Analysis (from experience records):

# of Test Cylinders Evaluated:	
Standard Deviation:	

$$f'_{cr} = f'_c + 1.34s \text{ or } f'_{cr} = f'_c + 2.33s - 500$$

(Refer to ACI 301 for increased deviation factor when less than 30 tests are available)

LABORATORY TEST DATA

Compressive Strength

Age (days)	Mix # 1	Mix #2	Mix #3
7	psi	psi	psi
7	psi	psi	psi
28	psi	psi	psi
28	psi	psi	psi
28 average	psi	psi	psi

REQUIRED ATTACHMENTS:

- Coarse Aggregate Gradation Report
- Fine Aggregate Gradation Report
- Concrete Compressive Strength Data or Trial Mixture Test Data
- Admixture Compatibility certification letter

Please Check

Submitted by:

Name: _____

Address: _____

Phone #: _____

Main Plant Location: _____

Miles from Project: _____

Secondary Plant Location: _____

Miles from Project: _____

Date: _____

PART 1 - GENERAL

1.01 SCOPE:

A. Owner will accomplish Work of this section, included here for reference; and will coordinate this Work with the Contractor's schedule.

A.B. Furnish all labor, materials, equipment and supervision to provide and install polished concrete in areas indicated on the drawings.

1.02 REFERENCES:

A. American Concrete Institute (ACI):

1. ACI 302.1R Guide for Concrete Floor and Slab Construction

B. ASTM International:

1. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
2. ASTM C171 Standard Specification for Sheet Materials for Curing Concrete.
3. ASTM C779 Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.

C. Reunion Internationale des Laboratoires D'Essais et de Recherches sur les Materiaux et les Constructions (RILEM):

1. Rilem Test Method 11.4 Standard Measurement of Reduction of Moisture Penetration Through Horizontal Concrete

D. National Floor Safety Institute (NFSI):

1. NFSI Test Method 101-A Standard for Evaluating High-Traction Flooring Materials, Coatings, and Finishes.

1.03 PERFORMANCE REQUIREMENTS:

A. Provide polished flooring that has been selected, manufactured and installed to achieve the following:

1. Abrasion Resistance: ASTM C779, Method A, high resistance, no more than 0.008 inch wear in 30 minutes.
2. Reflectivity: Increase of 35% as determined by standard gloss meter.
3. Waterproof Properties: Rilem Test Method 11.4, 70% or greater reduction in absorption.
4. High Traction Rating: NFSI 101-A, non-slip properties.

B. Design Requirements:

1. Hardened Concrete Properties:
 - a. Minimum Concrete Compressive Strength: 3500 psi (24 MPa).
 - b. Normal Weight Concrete: No lightweight aggregate.
 - c. Non-air entrained.
2. Placement Properties:
 - a. Natural concrete slump of 4 1/2 inches - 5 inches. Admixtures may be used.
 - b. Flatness Requirements:
 - i. Overall FF 40.
 - ii. Local FF 20.
3. Hard-Steel Troweled (3 passes) Concrete: No burn marks. Finish to ACI 302.1R, Class 5 floor.

1.04 ACTION SUBMITTALS:

- A. General: Submit listed action submittals in accordance with Division 01.
- B. Shop Drawings: Indicate information on shop drawings as follows:
 - 1. Typical layout including dimensions and floor grinding schedule.
 - 2. Plan view of floor and joint pattern layout.
 - 3. Areas to receive colored surface treatment.
 - 4. Hardener, sealer, densifier in notes.
- C. Product Data: Submit product data, including manufacturer's SPEC-DATA® product sheet, for specified products.
 - 1. Material Safety Data Sheets (MSDS).
 - 2. Preparation and concrete grinding procedures.
 - 3. Colored Concrete Surface, Dye Selection Guides.

1.05 INFORMATIONAL SUBMITTALS:

- A. Quality Assurance:
 - 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties as cited in 1.03 Performance Requirements.
 - 2. Certificates:
 - a. Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
 - b. Letter of certification from the National Floor Safety Institute confirming the system has been tested and passed phase Two Level of certification when tested by Method 101-A.
 - c. Current contractor's certificate signed by manufacturer declaring contractor as an approved installer of polishing system.
 - 3. Manufacturer's Instructions: Manufacturer's installation instructions.

1.06 CLOSEOUT SUBMITTALS:

- A. Warranty: Submit warranty documents specified.
- B. Operation and Maintenance Data: Submit operation and maintenance data for installed products.
 - 1. Include:
 - a. Manufacturer's instructions on maintenance renewal of applied treatments.
 - b. Protocols and product specifications for joint filing, crack repair and/or surface repair.

1.07 QUALITY ASSURANCE:

- A. Qualifications:
 - 1. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
 - 2. Installer trained and holding current certification for installation by manufacturer.
 - 3. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction and approving application method.
- B. Regulatory Requirements.
 - 1. NFSI Test Method 101-A Phase Two Level High Traction Material.
 - 2. Applicable Building Codes

C. Mock-Ups:

1. Mock-Up Size: 100 s.f. sample panel at jobsite at location as directed under conditions similar to those which will exist during actual placement.
2. Mock-up will be used to judge workmanship, concrete substrate preparation, operation of equipment, material application, color selection and shine.
3. Allow adequate time for inspection of mock-up before proceeding with work.
4. When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.08 PRE-INSTALLATION MEETING:

- A. Pre-installation meeting: To be attended by the Architect, General Contractor, Concrete Sub-Contractor, and Polished Concrete Sub-Contractor.
- B. Issue a proposed agenda to all parties requested to attend not less than 5 working days prior to the meeting. Include:
 1. Environmental requirements
 2. Scheduling and phasing of work
 3. Coordinating with other work and personnel
 4. Protection of adjacent surfaces.
 5. Surface preparation
 6. Repair of defects and defective work prior to installation
 7. Cleaning
 8. Installation of polished floor finishes.
 9. Application of liquid hardener, densifier.
 10. Protection of finished surfaces after installation.
- C. Convene a minimum of two weeks before starting work of this section.

1.09 WARRANTY:

- A. Time Period: Warrant that the Polished Concrete Floor will maintain its luster and overall appearance with reasonable cleaning for (36) months from date of Final Acceptance.
- B. Repairs:
 1. Repair unsatisfactory conditions promptly at no additional cost to the Owner.
 2. Emergency repairs may be made by the Owner without relieving the Contractor of his warranty obligations.
 3. Delays of more than 30 days for repair work will allow the Owner to proceed with such repairs at the Contractor's expense.

PART 2 PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Ensure manufacturer has minimum 5 years experience in manufacturing components similar to or exceeding requirements of project.

2.02 PRODUCTS/SYSTEM

- A. Manufacturer: L & M Construction Chemicals, Inc., 14851 Calhoun Rd., Omaha, NE 68152-1140; Telephone: (800) 362-3331, (402) 453-6600; Fax: (402) 453-0244; website: www.LMCC.com or alternate manufacturer approved by Architect prior to bidding:

- B. Products/Systems:
1. Hardener, Sealer, Densifier: Proprietary, water based, odorless liquid, VOC compliant, environmentally safe chemical hardening solution leaving no surface film.
 - a. Basis of Design: L & M Construction Chemicals, Inc., FGS Hardener Plus.
 2. Joint Filler: Semi-rigid, 2-component, self-leveling, 100% solids, rapid curing, polyurea control joint and crack filler with Shore A 80 or higher hardness.
 - a. Basis of Design: L & M Construction Chemicals, Inc., Joint Tite 750.
 3. Oil Repellent Sealer: Ready to use, silane, siloxane and fluoropolymers blended water-based solution sealer, quick drying, low-odor, oil and water repellent, VOC-compliant and compatible with chemically hardened floors.
 - a. Basis of Design: L & M Construction Chemicals, Inc., Petrotex.
 4. Concrete Dyes: Fast-drying dye, packaged in premeasured units ready for mixing with VOC exempt solvent; formulated for application to polished cementitious surfaces.
 - a. Basis of Design: L & M Construction Chemicals, Inc., Vivid Concrete Dyes.
 - b. Color: As selected by Architect.
 5. Cleaning Solution: Mild liquid concrete cleaner and conditioner containing wetting and emulsifying agents; biodegradable, environmentally safe and certified High Traction by National Floor Safety Institute (NFSI).
 - a. Basis of Design: L & M Construction Chemicals, Inc., FGS Concrete Conditioner.
 6. Finish: Standard Medium gloss (MG-2), 800 grit.

2.03 SOURCE QUALITY CONTROL

- A. Ensure concrete finishing components and materials are from single manufacturer.

3 PART III - EXECUTION

3.01 MANUFACTURERS INSTRUCTIONS

- A. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions.
- B. Use installers certified by the manufacturer.

3.02 EXAMINATION

- A. Site Verification of Conditions:
1. Verify that concrete substrate conditions, which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of concrete finishing materials.
- B. Verify Concrete Slab Performance Requirements.
1. Verify concrete is cured to 3500 psi strength.
 2. Verify concrete surfaces received a hard steel-trowel finish (3 passes) during placement.

3.03 PREPARATION

- A. Ensure that manufacturer's requirements for environmental conditions have been satisfied prior to installation. Verify that concrete has cured under appropriate conditions for the required amount of time and that slab has been exposed to climate-controlled conditions for the required length of time prior to installation.
- B. Ensure surfaces are clean and free of dirt and other foreign matter harmful to performance of concrete finishing materials.

- C. Examine surface to determine soundness of concrete for polishing.
- D. General Contractor to remove surface contamination.

3.04 INSTALLATION

A. Floor Surface Polishing and Treatment:

1. Provide polished concrete floor treatment in entirety of slab indicated by drawings. Provide consistent finish in all contiguous areas.
2. Apply floor finish prior to installation of fixtures and accessories.
3. Diamond polish concrete floor surfaces with power disc machine recommended by floor finish manufacturer. Sequence with coarse to fine grit using dry method.
 - a. Comply with manufacturer's recommended polishing grits for each sequence to achieve desired finish level. Level of sheen shall match that of approved mock-up.
 - b. Expose aggregate in concrete surface only as determined by approved mock-up.
 - c. All concrete surfaces shall be as uniform in appearance as possible.
4. Dyed and Polished Concrete:
 - a. Locate demarcation line between dyed surfaces and other finishes.
 - b. Polish concrete to final finish level.
 - c. Apply diluted dyes to polished concrete surface.
 - d. Allow dye to dry.
 - e. Remove residue with dry buffer; reapply as necessary for desired result.
5. Apply FGS Hardener Plus, Hardener, Densifier as Follows:
 - a. First coat at 250 ft²/gal (6.25 m²/L).
 - b. Second coat at 350 ft²/gal (8.75 m²/L).
 - c. Follow manufacturer's recommendations for drying time between successive coats.
6. Remove defects and re-polish defective areas.
7. Finish edges of floor finish adjoining other materials in a clean and sharp manner.

3.05 ADJUSTMENTS

- A. Polish to higher gloss those areas not meeting specified gloss levels per mock-up.
- B. Fill joints flush to surface.

3.06 OWNER ORIENTATION

- A. Upon completion and acceptance, the Polished Concrete Contractor shall instruct the Owner's maintenance personnel in the operation, maintenance of the polished concrete floor system. Furnish copies of all user guides, available parts lists, specifications and information on trouble shooting.

3.07 CLEANUP

- A. Keep all areas of work clean, neat and orderly at all times.
- B. Clean up and remove all excess materials and debris from the entire work area prior to Final Acceptance.
- C. Sweep or vacuum floor thoroughly.
 1. Do not wash stained concrete until after time period recommended by manufacturer.
 2. Damp-mop floor to remove marks and soil.

3.08 PROTECTION

- A. Protect installed product from damage during construction.

- B. Protect with EZ Cover™ by McTech Corp., (866) 913-8363, www.ezform.net, or comparable product approved by Architect.

END OF SECTION

PART 1 GENERAL

1.01 SCOPE:

- A. Furnish all labor, materials and equipment, and perform all work required to install masonry work as shown on the drawings, including brick, concrete block, precast masonry lintels, and all necessary incidental work in connection therewith.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions, Division 1, General Requirements, and the following sections apply to the work under this section.

Section 07 62 00 – Sheet Metal Flashing and Trim.

Section 07 92 00 – Joint Sealants.

1.03 QUALITY ASSURANCE:

- A. Qualifications of workmen:

1. For the actual cutting and placing of concrete masonry units, use only skilled journeyman masons who are thoroughly experienced with the materials and methods specified and thoroughly familiar with the design requirements.
2. In acceptance or rejection of installed concrete masonry units, no allowance will be made for lack of skill on the part of workman.
3. Provide at least one (1) skilled journeyman mason who shall be present at all times during execution of the work of this Section and who shall personally direct the execution of this portion of the work.

- B. Masonry units exposed to view shall be obtained from a single manufacturer; each type of product shall be from a single batch or production run.

- C. Cementitious ingredients of mortar mix shall be obtained from a single manufacturer. Each aggregate for mortar mix shall be obtained from a single source.

- D. Comply with applicable portions of the American Society for Testing and Materials (ASTM) Applicable codes and regulations of authorities having jurisdiction.

1.04 SUBMITTALS:

- A. Submit manufacturer's product data for each type of masonry unit, accessory and other manufactured products, including certifications that each type complies with specified requirements.

1.05 SAMPLES:

- A. Contractor shall have verification in writing from the Architect which brick is to be used prior to ordering brick.

- B. ***Before any exterior facebrick is laid up***, the Contractor shall erect a sample panel, including concrete block backup and mortar, approximately 4 feet wide by 4 feet high. When approved, the panel shall be left in place until facebrick work is completed to serve as a standard for all work. At Architect's option, one corner of the building may be used as a sample panel.

- C. Protect the sample panel from the elements with weather resistant membrane. Retain approved sample panel during construction as a standard for judging completed masonry work. When directed, demolish sample panel and remove debris from site.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver masonry materials in undamaged condition. Handle masonry units to prevent damage. Store in a manner to protect against excessive moisture, temperature changes, contaminants, corrosion or other causes. Limit absorption of moisture as specified for Type I units.
- B. Deliver cementitious materials in manufacturers' original, unopened containers.
- C. Store cementitious materials above ground, under cover and in dry enclosure.
- D. Store aggregates so that separation of types of materials can be maintained.
- E. Protect masonry accessories from corrosion and accumulation of dirt.

1.07 PROJECT CONDITIONS:

- A. Protect exposed masonry work against staining and mortar droppings. Keep top of walls covered with non-staining waterproof paper or plastic sheet when work is not in progress and during precipitation of rain or snow. When work is resumed, clean top surface of walls free of loose mortar and in dry weather wet the surface before proceeding.
- B. Turn scaffolding plank every night and when wet to prevent spattering mortar on face of walls.
- C. Do not superimpose any load to masonry work for 12 hours after erection. Allow 3 days before applying concentrated loads.
- D. Cold Weather Protection:
 - 1. Remove ice or snow from masonry bed by applying eat until top surface is dry to touch.
 - 2. Remove all frozen or damaged masonry work.
 - 3. Do not use wet or frozen units or units. Units must be minimum of 20°F (-7°C) when laid.
 - 4. Never allow mortar to freeze
- E. Construction Requirements While Work is Progressing:
 - 1. For all air temperatures below 40°F (4°C), heat sand or mixing water to produce mortar temperatures between 40°F (4°C) and 120°F (49°C).
 - 2. Additionally, for all air temperatures below 25°F (-4°C), provide heat sources on both sides of wall during construction AND provide windbreaks when wind exceeds 15 mph.
 - 3. Additionally, for all air temperatures 20°F (-7°C) and below, provide enclosures and heat to maintain air temperature above 32°F (0°C).
- F. Protection requirements for completed work:
 - 1. Mean daily air temperature: 40°F (4°C) to 32°F (0°C):
 - a. Protect masonry from rain or snow with weather-resistive covering for 24 hours.
 - 2. Mean daily air temperature: 32°F (0°C) to 25°F (-4°C).
 - a. Completely cover masonry with weather-resistive covering for 24 hours.
 - 3. Mean daily air temperature: 25°F (-4°C) to 20°F (-7°C).
 - a. Completely cover masonry with insulating blankets or equal protection for 24 hours.
 - 4. Mean daily air temperature: 20°F (-7°C) and below.
 - a. Maintain masonry temperature above 32°F (-7°C) for 24 hours by using enclosures and supplementary heat or with electric heating blankets.

PART 2 PRODUCTS

2.01 MASONRY MATERIALS:

- A. Field face brick and accent face brick: (Basis of Design) General Shale Brick, Inc., Elon Blend Modular to match existing color mix of adjacent classroom wing, including existing mortar color.
- B. Face brick exposed on the exterior and interior of building shall be 7-5/8" x 3-3/4" x 2-1/4" to lay up 3 courses in 8". Range of color shall be uniformly distributed in brick as delivered.
- C. Face brick to be used in exposed locations shall conform to the requirements of ASTM C216 Grade SW and shall be Type FBS.
- D. In locations where the cores of cored brick would be exposed use solid brick with finished faces and ends as required to present a finished face on the exposed face.
- E. Brick in concealed locations shall be culled face brick or all hard-burned common brick, conforming to ASTM C62-75A, Grade SW.
- F. Concrete block shall be hollow load-bearing concrete masonry units, conforming to ASTM C 90, Grade N-1, made with Shalite, or equal, light-weight aggregate. Units shall be steam cured at atmospheric pressure for not less than 12 hours at temperatures between 160 and 190 degrees F., and then shall be air dried and cured at least 28 days. When delivered to the site, units shall have a moisture content of not more than specified in ASTM C 90.
 - a. Units generally shall be 8 inches x 16 inches nominal face size and thicknesses shown on the drawings. Furnish all special sizes, lintel blocks and other special shapes required by job conditions.
 - a. Precast U-Lintels and special shapes made from 3,500 psi concrete with reinforcing bars placed as indicated and filled with coarse grout shall be acceptable upon review and approval by the Structural Engineer of Record. Units shall have a sand block finish to match adjacent CMU.
 - b. Basis of Design: Precast concrete u-lintels are based on products manufactured by Cast Crete. Subject to compliance with requirements.
 - b. All exterior corners of interior masonry walls to be exposed to view shall be made with bull-nose (radius edge) block.
- G. Where it is necessary to cut masonry, use an approved masonry saw. Use no units less than half size. Promptly remove units showing evidence of being broken and replace with properly cut units.

2.02 REINFORCING MATERIALS:

- A. Masonry wall reinforcing for all masonry walls and partitions shall be Dur-O-Wall ladder design, Heckmann, Hohmann and Barnard, Wire-Bond or approved equal, and shall have product approval of the International Building Code Congress. Reinforcing shall be manufactured from cold drawn steel wire conforming to ASTM A 8272 and shall consist of two deformed longitudinal rods welded at 16" intervals to a continuous diagonal cross rod forming a truss design. Out-to-out spacing of side rods shall be approximately 2" less than the nominal thickness of the wall or partition. Cross rods and side rods shall be not less than No. 9 gauge.
 - 1. Reinforcing for CMU walls shall be Dur-O-Wall DA 320.
 - 2. Reinforcing for use with brick veneer at C.M.U. walls shall be Dur-O-Wall D/A 360 Ladur-Eye or equal spaced 16 inches on center each way.

3. Brick ties at metal stud framing shall be Dur-O-Wall D/A 213 with 14 gauge screw on plate and 3/16" pintles at 16" on center, each way.
4. Brick ties at wood stud framing shall be Dur-O-Wall D/A 990 22 gauge corrugated brick ties at 16" on center each way
5. Interior walls: reinforcement shall be galvanized in accordance with ASTM A 641 Class 1 (.4 ounces per square foot.)
6. Exterior walls reinforcement shall be galvanized in accordance with ASTM A 153 Class B2 (1.5 ounces per square foot).
7. When ordering cavity wall reinforcing, the Contractor must specify the CMU thickness, Cavity Wall Insulation thickness if any, the cavity width, and the Brick Thickness.

2.03 MORTAR MATERIALS:

- A. Portland Cement shall conform to ASTM C150, Type 1. Masonry cement shall conform to ASTM C91, and shall be equal to Cemex, Essroc Italcementi Group, Holcim or Lafarge North America. Hydrated lime shall conform to ASTM C207, Type S.
- B. Aggregate for mortar shall be natural or manufactured sand conforming to ASTM C 144; except for joints less than 1/4" thick, use aggregate graded with 100 percent passing the No. 16 sieve and shall be uniform in color for all masonry work.
- C. Mixing water shall be clean and free from harmful amounts of acids, alkalies, and organic materials.
- D. Mortar shall conform to requirements of ASTM C270. Mortar for masonry work below grade shall be one part Portland Cement, 1/4 part hydrated lime or lime putty, and not less than 2-1/4 nor more than 3 parts sand, by volume, or any other mix conforming to ASTM requirements for Type M or Type S mortar. Mortar for masonry work above grade shall be one part masonry cement to not less than 2-1/4 nor more than 3 parts sand, by volume, or any other mix conforming to ASTM requirements for Type S or Type N mortar.
- E. Sand for mortar shall be measured in a damp loose condition. Mix mortar with the maximum amount of water consistent with satisfactory workability for a minimum of 3 minutes in a drum type mechanical mixer. Mixer shall be thoroughly cleaned between batches. Water may be added to mortar to maintain workability. No mortar older than 1 hour shall be used.
- F. Colored mortar for use with face brick shall contain colored masonry cement similar and equal to Brixment as manufactured by Cemex, Essroc Italcementi Group, Holcim or Lafarge North America.

2.04 CAVITY DRAINAGE SYSTEM:

- A. Provide mortar/drainage netting at base of brick veneer cavities in size to completely fill width of cavity. Mortar netting shall be manufactured using recycled polyester or polyethylene. The following are acceptable products, alternate products must be approved prior to bidding:
 1. Mortar Net as manufactured by Mortar Net USA, LTD.
 2. Mortar Break as manufactured by Advanced Building Products, Inc.
 3. Driwall Mortar Deflection as manufactured by Keene Building Products
- B. Provide Weep Vents in masonry veneer over cavity at 24 inches on center and at the base of all cavity walls above flashing and above and below window and door openings above thru-wall flashing and as shown on the drawings. Weep Vents shall be 2-5/8 inch by 3 1/2 inch by 1/2 inch recycled polyester mesh. The following are acceptable products, alternate products must be approved by Architect prior to bidding:
 1. Weep Vents as manufactured by Mortar Net USA LTD.
 2. Cell Vent as manufactured by Advanced Building Products, Inc.
 3. Weep Vents 025 as manufactured by Keene Building Products.

2.05 CONTROL JOINTS:

- A. "Wal-Joint", wide flange type, as manufactured by Hohmann & Barnard, Inc., approved equals of Dur-o-wal, Carter-Waters, Tywal Accessories, or Vinyl's are acceptable.
- B. Provide vertical control joints in all masonry walls that exceed 32'-0" in length and/or exceed a ratio of panel length to height (L/H) of 3.
- C. All joint locations must be verified and approved by the Architect. Control joints shall not be placed above or at the side of a masonry opening except where necessary to separate masonry supported off the foundation from that supported from the structure.
- D. Steel lintels supporting masonry shall be discontinuous at control joints & expansion joints.

2.06 EXPANSION JOINTS IN BRICK VENEER:

- A. Provide vertical expansion joints in brick veneer walls at thirty-five feet (35'-0") on center maximum.

3PART 3 EXECUTION

3.01 COORDINATION WITH OTHER WORK:

- A. Coordinate with other trades to insure that they have ample opportunity to build in their work as the masonry work progresses. Build in frames, anchors, and other incidental items furnished under other sections of the specifications. Set loose steel lintels and construct chases and recesses as required. Verify dimensions and locations of anchors, chases, etc., with the other trades involved.
- B. Build in through wall flashing as masonry is laid ensuring laps at ends and end dams at end of flashing above and below openings.
- C. Coordinate the masonry work for reinforced masonry block brick walls closely with the installation of the concrete fill and steel reinforcement.
- D. Furr out around piping and electrical panels and other items wherever the existing wall or proposed walls are not thick enough to accommodate items that are scheduled to go in them.
- E. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been completely resolved.

3.02 TOLERANCES FOR CONSTRUCTION:

- A. Bed joints and head joints shall be nominal 3/8" thick with slight variations allowed (5/16" to 7/16") to adjust coursing and to avoid cutting. Standard coursing for brick: 3 bricks and 3 mortar joints shall equal 8 inches unless otherwise noted.
- B. Variation from the plumb in the lines and surfaces of columns, walls, and arises shall not exceed 1/8" in 10' and 3/8" in a story height or 3/8" in 20'-0" maximum. Variation from plumb for external corners, expansion joints and other conspicuous lines, shall not exceed 1/4" in any story or 1/4" in 20'-0" maximum.
- C. Variation from the level of the grades indicated on the Drawings for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines shall not exceed 1/4" in any bay or module or 20'-0" (whichever dimension is the least) nor 1/2" in 40'-0" or more.
- D. Variation of the linear building line from an established position in plan and related portion of columns, walls, and partitions shall not exceed 1/4" in any bay or module or 20'-0" (whichever dimension is the least) nor 3/4" in 40'-0" or more.

- E. Variation in cross-sectional dimensions of columns and thickness of walls shall not exceed minus 1/4", nor plus 1/2" from the dimensions indicated on the Drawings.

3.03 CAVITIES

1. Keep cavities clean of mortar droppings and other materials during construction.
 - a. Install Cavity Drainage Material in cavities in accordance with manufacturer's recommendations.
 - b. 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. Install Weep Vents at 24 inches on center at the base of wall cavities, above and below window openings above thru wall flashing and elsewhere as shown on the drawings.
- C. Installing Cavity-Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach 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.
 - a. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.04 LAYING BRICK:

- A. Wet brick prior to laying unless their gain in weight is less than 3/4 oz. when immersed in 1/4" of water for one minute. Lay in full bed of slightly furrowed mortar and fill head joints completely.
- B. Lay facebrick on exterior walls in **common bond** and anchor to backup and to inner wythe with steel masonry reinforcing.
- C. Brick veneer shall be returned against CMU or sheathing at all openings in exterior wall as required to close cavity.

3.05 LAYING CONCRETE BLOCK:

- A. Lay with full mortar coverage on vertical and horizontal face shells. Vertical joints in exposed concrete block work shall break at center of stretcher above and below; otherwise, bond each course at corners and intersections and break vertical joints at least 4".
- B. Broken or split block shall not be used. All cutting required shall be done with a masonry saw. The mortar bedding for anchors for door bucks and frames shall be spread on strips of 1/8" mesh hardware cloth about 12" long.
- C. Install steel masonry reinforcing in all concrete block walls and partitions. Partitions abutting exterior walls shall be anchored thereto with steel masonry reinforcing unless otherwise noted.
- D. Partitions enclosing pipe and duct chases shall be built after the piping and ducts are in place and have been tested and approved.
- E. All partitions shall extend from concrete floor slabs to underside of roof deck except where specifically noted or shown otherwise. All partitions shall be not less than 1-hour fire-resistive construction and the concrete blocks shall be UL listed or shall conform to requirements of the Building Code adopted by the authority having jurisdiction for 1-hour fire-resistance.
- F. Provide centering and install bond beam block over all openings greater than 24" wide in concrete walls and partitions, including openings for panelboards, ducts, and grills. Extend bond beams 8 inches minimum beyond edge of opening each side. Reinforce bond beams as noted on the drawings or with a

minimum of 1 #5 bar top and bottom if not noted on the drawings. Fill Bond beams with concrete before laying next course of block.

- G. Install spandrel blocks for bond beams at the top of all masonry walls unless noted otherwise.
- H. Where masonry is to be exposed in the interior of a building the mortar joint at the intersection of interior masonry wall with exterior masonry wall shall be raked ¼ inch deep and caulked.

3.06 FLASHING:

- A. Place flashing in masonry work on a bed of mortar. Cover flashing with bed of mortar before placing units on flashing. Do not puncture flashing. Join sections of flashings by overlapping 6 inches minimum and fastening with adhesive to provide watertight joints. Turn up ends of flashing to provide positive drain to exterior. Comply with flashing manufacturer's recommendations. Install thru-wall flashings where shown on the drawings and in the following locations:
 - 1. Above all openings in exterior walls extend 12" beyond opening.
 - 2. Above all intersections of floors and exterior walls.
 - 3. Above all intersections of roofs with parapet walls, penthouses and all other exterior walls.
 - 4. Weep holes shall be installed above thru-wall flashings.

3.07 WORKMANSHIP:

- A. Masonry work shall be sound, straight, true, and complete in every respect, and exterior walls shall be so constructed as to preclude the penetration of water. Avoid over-plumbing and pounding of masonry units after they are set in place; where adjustments must be made after mortar has started to set, the mortar shall be removed and replaced with fresh mortar.
- B. Joints shall be thickness to conform to coursing specified or shown and shall be uniform and bond shall be true.
- C. Hollow metal door frames in masonry walls shall be filled solidly with mortar as the walls are laid up, but forming a cavity behind rubber bumper opening with a wad of newspaper. Unless otherwise specifically shown or specified, the space around anchors, flashing, steel lintels, and similar items built into the masonry work shall be filled solidly with mortar.
- D. Where nails or line pins have been used, they shall be removed when they have served their purpose and the holes left by their removal shall be filled immediately with fresh mortar.

3.08 POINTING

- A. After masonry work is completed, remove all line pins and point up all holes and open joints.

3.09 TOOLING:

- A. Tool all joints concave unless otherwise noted. Joints in exposed faces of facebrick on exterior and concrete block on interior shall be tooled with a round steel jointer, except at changes in brick color, just before the mortar hardens, with sufficient force to press the mortar against the masonry units on each side of the joint.
- B. Joints where brick changes color shall be raked joints. Face joints in concealed locations shall be struck flush
- C. Cut joints flush in block surfaces which will be concealed in the finished work or to which a finish material (other than paint) shall be supplied.

3.10 CLEANING OF MASONRY:

- A. Face of brick work shall be kept clean of mortar droppings, stains, and soil as the work progresses insofar as possible. The completed work shall be cleaned by methods approved by the Architect, equivalent to the following:
1. Cleaning shall not be started until mortar is thoroughly set and cured. Then surfaces shall be dry cleaned by removing large particles of mortar with wood paddles and scrapers, using a chisel or wire brush where necessary.
 2. Presoak wall by saturating the masonry with clean water and flush off all loose mortar and dirt.
 3. While the surface is still saturated, starting at top of wall, scrub down with a solution mixed in the proportions of one-half cup of trisodium phosphate (Calgon) and one-half cup household detergent (All) dissolved in one gallon of clean water. Scrub with stiff fiber brushes only. Keep wall area below work area wet down at all times.
 4. After scrubbing thoroughly, rinse off all cleaning solution, dirt and mortar crumbs, using pressurized water from a hose.
- B. In areas where the preceding procedure is not adequate, use a similar procedure, but substitute an acid solution instead of the cleaner solution for scrubbing. Acid solution shall be mixed one part clean, stain-free commercial grade of hydrochloric (Muriatic) acid to nine parts clean water, mixed in a non-metallic container. Keep all brick work below the area being cleaned, soaked and flush free of acid and dissolved mortar before it becomes dry. Do not use wire brushes or metal tools and do not allow acid solution to come in contact with any metal or cast stone work. Acid solution shall be used only as a last resort and where expressly permitted by the Architect.
- C. Exposed concrete block surfaces shall be kept clean of mortar droppings as the work progresses and the completed work shall be dry-cleaned to remove remaining mortar spots and dirt. Surface shall be brushed free of dust before painting.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

A Furnish all material, labor, equipment, and supervision required to provide, fabricate, and install the following:

1. Structural steel framing members.
2. Baseplates and anchor plates.
3. Grouting under baseplates.

1.02 RELATED DOCUMENTS:

A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 05 50 00 – Metal Fabrications: For steel lintels or shelf angles not attached to structural-steel frame; miscellaneous steel fabrications; and other metal items not defined as structural steel.

1.03 PERFORMANCE REQUIREMENTS:

A Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand ASD-service loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated and AISC's "Manual of Steel Construction"
 - a. Construction: Type 1, rigid frame and 2, simple framing.

1.04 SUBMITTALS:

A Submit under provisions of Section 01 30 00 – Administrative Requirements.

B Shop Drawings:

1. Indicate profiles, sizes, spacing, and locations of structural members, openings, attachments and fasteners.
2. Connections.
3. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.

C Manufacturer's Mill Certificate: If requested by the Engineer, submit under provisions of Section 01 41 00 and Section 01 45 00 certifying that products meet or exceed specified requirements.

D Mill Test Reports: If requested by the Engineer, submit under provisions of Section 01 41 00, Manufacturer's Certificates, indicating structural strength, destructive and nondestructive test analysis.

E Welders' Certificates: If requested by the Engineer, submit under provisions of Section 01 41 00 Manufacturer's Certificates, certifying welders employed on the Work, verifying AWS qualifications within the previous 12 months.

F Inspection test reports: Inspecting agency shall provide reports of tests conducted. Test results shall be reported to the Architect and Contractor in writing on the same day that the test is made. All tests reports indicating non-compliance should be faxed immediately to all parties on the test report distribution list.

1. Reports shall contain the project identification name and number, date of test, and location of test by column grid/ piece number as noted in the shop drawings.

1.05 QUALITY ASSURANCE:

- A Fabricate structural steel members in accordance with AISC-Steel Construction Manual "Specification for Structural Steel Buildings".
- B Provide qualifications for review and approval during the bidding process:
1. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE, **OR** as approved in writing after examination of Installer history by Structural Engineer.
 2. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD" at time of bid **OR** as approved in writing after examination of Fabricator history by Structural Engineer.
- C Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."
1. Comply with applicable provisions of the following specifications and documents:
 2. AISC's "Code of Standard Practice for Steel Buildings and Bridges."
 3. AISC's "Seismic Provisions for Structural Steel Buildings" and "Supplement No. 2."
 4. AISC's "Specification for Structural Steel Buildings"
 5. AISC's "Specification for the Design of Steel Hollow Structural Sections."
 6. AISC's "Specification for Allowable Stress Design of Single-Angle Members".
 7. AISC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1.06 QUALIFICATIONS:

- A Fabricator: Company specializing in performing the work of this section with minimum 3 years experience approved by the American Institute of Steel Construction Quality Certification Program, Category II or III.
1. A Fabricator not complying with Category II or III shall have an established, documented in-house quality control and testing program to assure accuracy and adequacy of fabrication procedures and completed work, or shall have fabrication procedures and fabricated steel tested and inspected by an independent testing agency as directed by the Structural Engineer. Tests and inspections are to be performed by AWS Certified Welding Inspectors. **Fabricator shall submit documentation of quality control procedures to the Structural Engineer for review. The Structural Engineer shall be the sole judge of the adequacy of the proposed quality control program.** Submit copies of the inspection reports to the Structural Engineer. Payment of these tests and inspections will be by the fabricator. Tests and inspections shall include the following:
 - a. Examine mill tests reports and verify that material being used is the same as the mill test reports.
 - b. Review the fabricator's written welding procedures. Verify that the fabricator's welding procedures are being adhered to.
 - c. Verify that welders are certified with current papers and that they demonstrate proper techniques.
 - d. Examine joint preparation for complete penetration joints. Ultrasonically test complete penetration joints.
 - e. Examine fillet welds for proper size, profile, throat, porosity and end returns.
 - f. Examine steel members for laminations. Spot check dimensions and hole sizes.
 - g. The purpose of this inspection is to enable the testing agency to verify that, in general, the steel is being fabricated in accordance with the proper specifications. A minimum of one trip should be scheduled in the early stages of fabrication.
- B Adhesive Anchors: Rawl/Powers Chem-Stud or equivalent manufactured by Hilti or Ramset/Red Head.
- C Erector: Company specializing in performing the work of this section with a minimum 3 years experience.

D Design connections not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the state where the project is located.

1.07 REFERENCES:

A The following are to be used as reference standards:

1. Structural Steel angles, channels, and plate: ASTM A36; W-Shapes: A992.
2. ASTM A108 - Steel Bars, Carbon, Cold Finished, Standard quality.
3. ASTM A123 - Zinc (Hot Dipped Galvanized) Coatings on iron and steel products.
4. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.
5. ASTM A325 - High Strength Bolts for Structural Steel Joints.
6. ASTM A500 - Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
7. AWS A2.0 - Standard Welding symbols.
8. AWS D1.1 - Structural Welding Code.
9. AISC - Specification for the design, Fabrication and Erection of Structural Steel for Buildings.
10. SSPC - Steel Structures Painting Council.

1.08 SPECIAL INSPECTIONS:

A Special inspections shall be performed by a Special Inspector retained by the Owner.

B Bolted Connections: Field-bolted connections will be tested and inspected according to AISC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

1. Manually torque test 10% of all bolted connections to verify correct tightness.

C Welded Connections: Field welds will be visually inspected according to AWS D1.1. A certified AWS Weld Inspector shall visually inspect 100% of welded moment connections and 10% of all other welded connections.

1. In addition to visual inspection, if requested by the Engineer, field welds will be tested according to AWS D1.1 and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.

D In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1 for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than- continuous 360-degree flash or welding repairs to any shear connector.
2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1.
3. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

1.09 DELIVERY, STORAGE, AND HANDLING:

A Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.

1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.10 COORDINATION:

- A Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART II PRODUCTS

2.01 MATERIALS:

- A Structural Steel Members: Channels, Angles, Plates: ASTM A36; W-Shapes: A992.
- B Structural Tubing: ASTM A500, Grade B.
- C Headed Studs: ASTM A108, Grade 1015, forged steel, headed, uncoated.
- D Bolts, Nuts, and Washers: ASTM A325.
- E Anchor Bolts: ASTM A307.
- F Welding Materials: AWS D1.1; type required for materials being welded.
- G Grout: No-shrink type, premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days.
- H Shop and Touch-Up Primer: SSPC Paint 15, Type 1, red oxide or fabricator's standard.
- I Protection for Structural Steel from Earth, Stone Backfill, or Concrete Backfill: 1/8 inch thick coat Hydrocide Mastic. Use one of the following in accordance with manufacturer's recommendations:
1. One coat Hydrocide 700 or two coats Hydrocide 700B by Degussa Building Systems.
 2. One coat MasterSeal 614 or two coats MasterSeal 615 by BASF.
 3. Additional alternate manufacturers must be approved by Engineer prior to Bidding and provide product equal to or exceeding specified requirements.

2.02 STRUCTURAL-STEEL MATERIALS

- A Structural Steel Members: Channels, Angles, Plates, M and S shapes: ASTM A36.
- B W-Shapes: ASTM A992, Grade 50
- C Plate and Bar: ASTM A 36/A 36M.
- D Corrosion-Resisting Structural Steel: ASTM A 588/A 588M, Grade 50 (345).
- E Structural Tubing: ASTM A500, Grade B.
- F Corrosion-Resisting Cold-Formed Hollow Structural Sections: ASTM A 847, structural tubing
- G Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
1. Weight Class: As indicated on the drawings.
 2. Finish: Black, except where indicated to be galvanized.
- H Medium-Strength Steel Castings: ASTM A 27/A 27M, Grade 65-35 (Grade 450-240), carbon steel.

- I High-Strength Steel Castings: ASTM A 148/A 148M, Grade 80-50 (Grade 550-345), carbon or alloy steel.
- J Headed Studs: ASTM A108, Grade 1015, forged steel, headed, uncoated.
- K Welding Materials: AWS D1.1; type required for materials being welded.
- L Grout: No-shrink type, premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days.
- M Shop and Touch-Up Primer: SSPC Paint 15, Type 1, red oxide or fabricator's standard.
- N Protection for Structural Steel from Earth, Stone Backfill, or Concrete Backfill: 1/8 inch thick coat Hydrocide Mastic. Use one of the following in accordance with manufacturer's recommendations:
 - 1. One coat Hydrocide 700 or two coats Hydrocide 700B by Degussa Building Systems.
 - 2. One coat MasterSeal 614 or two coats MasterSeal 615 by BASF.
 - 3. Additional alternate manufacturers must be approved by Engineer prior to Bidding and provide product equal to or exceeding specified requirements.

2.03 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436
 - 1. Finish: Plain.
 - 2. Direct-Tension Indicators: If requested by Engineer: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8,) compressible-washer type.
 - a. Finish: Plain.
- B. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers, plain.
 - 1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M,) Type 10.9, compressible-washer type, plain.
- C. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: If requested by Engineer: ASTM F 1852, Type 1, heavy hex or round head steel structural bolts with splined ends; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.
 - 1. Finish: Plain.
- D. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.
- E. Unheaded Anchor Rods: ASTM F 1554, Grade 36.
 - 1. Configuration: Straight.
 - 2. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
 - 3. Plate Washers: ASTM A 36/A 36M carbon steel.
 - 4. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
 - 5. Finish: Plain.
- F. Headed Anchor Rods: ASTM F 1554, Grade 36.

1. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
 2. Plate Washers: ASTM A 36/A 36M carbon steel.
 3. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
 4. Finish: Plain.
- G Threaded Rods: ASTM A 36/A 36M and ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6).
1. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
 2. Washers: ASTM F 436 ASTM F 436M or hardened ASTM A 36/A 36M carbon steel where noted.
 3. Finish: Plain.
- H Clevises/Turnbuckles: ASTM A 108, Grade 1035, cold-finished carbon steel.
- I Eye Bolts and Nuts: ASTM A 108, Grade 1030, cold-finished carbon steel.
- J Sleeve Nuts: ASTM A 108, Grade 1018, cold-finished carbon steel.
- 2.04 FINISH:
- A Prepare structural component surfaces in accordance with SSPC SP-2.
- B Shop prime structural steel members. Do not prime surfaces that will be field welded or high strength bolted, or in contact with concrete or masonry.
- 2.05 PRIMER
- A Primer: SSPC-Paint 25, Type II, iron oxide, zinc oxide, raw linseed oil, and alkyd.
- B Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer.

PART III EXECUTION

3.01 FIELD MEASUREMENTS:

- A Verify that field measurements are as shown on shop drawings.

3.02 FABRICATION:

A Shop Fabrication and Assembly

1. Fabricate items of structural steel in accordance with AISC specifications for Type I construction and as indicated on the approved shop drawings. Provide camber in structural members as shown.
 2. Properly mark and match-mark materials for field assembly and for identification as to the structure and site for which they are intended. Fabricate for a delivery sequence that will expedite erection and minimize field handling of materials.
 3. Where finishing is required, complete the assembly (including welding of units) before start of finishing operations. Provide finish surfaces of members exposed in the final structure free of markings, burrs, and other defects.
- B Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings."
1. Camber structural-steel members where indicated.
 2. Identify high-strength structural steel according to ASTM A 6/ A 6M and maintain markings until structural steel has been erected.
 3. Mark and match-mark materials for field assembly.

4. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- C Architecturally Exposed Structural Steel: Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel identified as architecturally exposed structural steel.
1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, seam marks, roller marks, rolled trade names, and roughness.
 2. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.
- D Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.
- E Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- F Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- G Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning or SSPC-SP 3, "Power Tool Cleaning."
- H Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.
- I Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural steel. Straighten as required to provide uniform, square, and true members in completed wall framing.
- J Welded Door Frames: Build up welded door frames attached to structural steel. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk, cross-recessed head machine screws, uniformly spaced not more than 10 inches (250 mm) o.c., unless otherwise indicated.
- K Holes: Provide holes required for securing other work to structural steel and for passage of other work through steel framing members.
1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 2. Base-Plate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.
- L Connections
1. Provide bolts and washers of all types and sizes required for the completion of all field erection.
 2. High Strength Bolted Construction: Install high strength threaded fasteners in accordance with AISC Specifications for Structural Joints Using ASTM A325 Bolts, 3/4" diameter, minimum. Connections are to be considered bearing connections.
 3. Install by the turn of the nut method, or direct tension indicators or alternate design bolts.
 4. Welded Construction: Comply with the AWS Code for procedures, appearance, and quality of welds and for methods used in correcting welded work. Grind smooth any welds that will be exposed.
 5. Assemble and weld built-up sections by methods that produce true alignment of axes without warp.

3.03 SHOP CONNECTIONS

- A High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
1. Joint Types: Snug tightened, Pretensioned.
- B Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
1. Remove backing bars or runoff tabs, back gouge, and grind steel smooth if to remain exposed.
 2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
 3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.
 - a. Grind butt welds flush.
 4. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.
- C Holes for Other Work
1. Provide holes required for securing other work to structural steel framing and the passage of other work through steel framing members as shown on the final shop drawings. Provide threaded nuts welded to framing and other specialty items as shown to receive other work.
 2. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
- D Anchor Bolts
1. Provide anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.
 2. Provide templates and other devices necessary for presetting bolts and other anchors to accurate locations.
- E Bases and Bearing Plates
1. Bases and bearing plates shall be shop welded to columns and members attached to concrete and masonry. Install slide bearing plates and protect against damage in accordance with the manufacturer's written directions.
- F Splicing
1. Splice members only where indicated unless, with the Architect's approval, splices not indicated would result in lower costs due to reduced shipping costs. Submit structural calculations signed by a structural engineer licensed where the fabricator is located for all splices not indicated.
- G Gas Cutting
1. Do not use gas cutting torches for correcting fabrication errors in the structural framing. Cutting will be permitted only on secondary members, as acceptable to the Architect. Finish gas cut sections equal to a sheared appearance when gas cutting is permitted.

3.04 SHOP PRIMING

A Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
2. Surfaces to be field welded.
3. Surfaces to be high-strength bolted with slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials.
5. Galvanized surfaces.

B Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning." Other methods if approved by Engineer.

C Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

Stripe paint corners, crevices, bolts, welds, and sharp edges.

1. Apply two coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.

D Painting: Apply a 1-coat, non-asphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils (0.038 mm).

3.05 EXAMINATION:

A Verify that field conditions are acceptable and are ready to receive work.

B Beginning of installation means erector accepts existing conditions.

3.06 ERECTION:

A Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

B Field weld components indicated on Drawings and Shop Drawings.

C Do not field cut or alter structural members without approval of Architect.

D After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

E Grout under baseplates and bearing plates prior to installation of secondary framing.

F Erection shall be in accordance with AISC Code of Standard Practice.

G Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings".

H Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.

1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
 2. Weld plate washers to top of base plate.
 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate before packing with grout.
 4. Promptly pack grout solidly between bearing surfaces and base or bearing plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- I Maintain erection tolerances of structural steel and architecturally exposed structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- J Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
1. Level and plumb individual members of structure.
- K Splice members only where indicated.
- L Remove erection bolts on welded, architecturally exposed structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.
- M Do not use thermal cutting during erection unless approved by Engineer. Finish thermally cut sections within smoothness limits in AWS D1.1.
- N Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- O Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.
- 3.07 FIELD CONNECTIONS
- A High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
1. Joint Type: Snug tightened Pretensioned.
- B Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.08 REPAIRS AND PROTECTION

A Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories and abutting structural steel.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

END OF SECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Additional requirements for structural steel members designated as architecturally-exposed structural steel (AESS).

1.02 RELATED REQUIREMENTS

- A. Section 05 12 00 - Structural Steel Framing: General requirements for structural steel members, including AESS framing specified in this section.
- B. Section 05 21 00 - Steel Joist Framing: Alignment and location of bridging where joists are visible.
- C. Section 05 31 00 - Steel Decking: Erection requirements relating to exposed steel decking and its connections.
- D. Section 05 50 00 - Metal Fabrications: Loose steel bearing plates and miscellaneous steel framing.
- E. Section 09 91 00 - Painting: Finish coat requirements and coordination with primer and surface preparation specified in this section.

1.03 DEFINITIONS

- A. Architecturally-Exposed Structural Steel: Structural steel complying with designated AESS category as defined in AISC 303.

1.04 REFERENCE STANDARDS

- A. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2016.
- B. AISC 360 - Specification for Structural Steel Buildings; 2016.
- C. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2017.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- F. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2009 (Reapproved 2015).
- G. ASTM A1085/A1085M - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS); 2015.
- H. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
- I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).
- K. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- L. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Schedule and conduct a preinstallation meeting at project site one week prior to start of work of this section; require attendance by all affected installers. Coordinate requirements for shipping, special handling, storage, attachment of safety cables and temporary erection bracing, final coating, touch-up painting, mock-up coordination, MBI Companies's observations, and other requirements for AESS.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product data for each type of product specified. Submit paint systems in accordance with Section 09 91 13.
- C. Shop Drawings: Detailing for fabrication of AESS components.
 - 1. Provide erection documents clearly indicating which members are AESS members and the AESS category of each part.
 - 2. Include details that clearly identify AESS requirements found in this specification. Provide connections for AESS consistent with concepts shown on drawings.
 - 3. Indicate welds by AWS A2.4 symbols, distinguishing between shop and field welds, and show size, length and type of each weld. Identify grinding, finish and profile of welds as defined by the designated AESS category.
 - 4. Indicate orientation of hollow structural section (HSS) seams and mill marks (where applicable).
 - 5. Indicate type, size, finish and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tensioned shear/bearing connections. Indicate orientation of bolt heads.
 - 6. Indicate which surfaces or edges are exposed and what class of surface preparation is being used.
 - 7. Indicate special tolerances and erection requirements as noted on drawings or defined by the designated AESS category.
 - 8. Indicate vent or drainage holes for HSS members.
- D. AESS 1, AESS 2, AESS 3, AESS 4, and AESS C Samples: Provide samples of specific AESS characteristics. Samples may be small size samples or components of conventional structural steel demonstrating specific AESS characteristics, including surface preparation, sharp edges ground smooth, continuous weld appearance, weld show through, and fabrication mark removal.
- E. Qualification data for fabricator and erector to demonstrate their capabilities and experience. Include lists of completed projects names and address, names and addresses of architects and owners, photographs showing detail of installed AESS, and other information specified.

1.07 QUALITY ASSURANCE

- A. Fabricator Qualifications: In addition to those qualifications listed in Section 05 12 00, engage an AISC Certified Fabricator, experienced in fabricating AESS similar to that indicated for this project with a record of successful in-service performance, as well as sufficient production capacity to fabricate AESS without delaying the work.
- B. Erector Qualifications: In addition to those qualifications listed in Section 05 12 00, engage an AISC Certified Erector, experienced in erecting AESS work similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.
- C. Comply with applicable provisions of AISC 303, Section 10 for the designated AESS category.
- D. Owner to engage a quality assurance agency per requirements of AISC 360, Chapter N and AISC 303, Section 10.
- E. Contractor to engage a quality assurance agency per requirements of AISC 360, Chapter N and AISC 303, Section 10.

1.08 MOCK-UP

- A. Provide mock-ups for AESS 3, AESS 4, and AESS C of nature and extent indicated in Contract Documents.
- B. See Section 01 40 00 - Quality Requirements for additional requirements.
- C. Locate mock-ups in fabricator's shop. Mock-ups to be full-size unless MBI Companies approves smaller models. Alternatively, when a mock-up is not practical, the first piece of an element or connection can be used to determine acceptability.
- D. Notify MBI Companies one week in advance of dates and times when mock-ups will be available for review.
- E. Demonstrate applicable AESS characteristics for specified category of AESS on elements and joints in mock-up.
- F. Build mock-ups using member sizes and materials indicated for final work.

- G. Mock-up to demonstrate weld quality, contouring of welds at aligned walls of members, specified surface preparation, and finish coating.
- H. HSS members to extend at least 6 inches from joint in mock-up.
- I. Obtain MBI Companies written approval of mock-ups before starting fabrication.
- J. Retain and maintain mock-ups during construction in an undisturbed condition as a standard for judging completed work.
- K. Approved mock-ups in an undisturbed condition at Date of Substantial Completion may become part of completed work.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Handle finished pieces in accordance with Section 10 of AISC 303, using nylon-type slings, or chains with softeners, or wire ropes with softeners such that they are not damaged.
- B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. Use special care in handling to prevent twisting or warping of AESS members.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Comply with Section 05 12 00, except as amended in this section for aesthetic purposes.
- C. Comply with AISC 303, Section 10 for specific AESS as follows:
 - 1. Freestanding Canopy: AESS 4.

2.02 FABRICATION

- A. Fabricate and assemble AESS in shop to greatest extent possible. Locate field joints in AESS assemblies at concealed locations or as approved by MBI Companies. Detail AESS assemblies to minimize field handling and expedite erection.
- B. Permissible tolerances for member depth, width, out of square, and camber and sweep to be as specified in ASTM A6/A6M, ASTM A500/A500M, and ASTM A1085/A1085M.
- C. For curved structural members, whether composed of a single standard structural shape or built-up, the as-fabricated variation from theoretical curvature to be equal to or less than standard camber and sweep tolerances permitted for straight members in applicable ASTM standard.
- D. Use special care in handling and shipping of AESS both before and after shop painting to minimize damage to any shop finish. Use nylon-type slings or softeners when using chains or wire rope slings.
- E. Bolted Connections:
 - 1. Make in accordance with Section 05 12 00. Provide bolt type and finish as noted herein.
- F. Welded Connections:
 - 1. Comply with AWS D1.1/D1.1M and Section 05 12 00.
 - 2. Assemble and weld built-up sections by methods that will maintain alignment of members without warp exceeding tolerances of this section.
- G. Surface Preparation:
 - 1. Remove blemishes or unsightly surfaces resulting from temporary braces or fixtures.
 - 2. Remove backing and run out tabs.
- H. Fabricate AESS in accordance with categories defined in AISC 303, as follows:
 - 1. AESS 1: Basic elements.
 - 2. AESS 2: Feature elements viewed at a distance greater than 20 feet (feature elements not in close view).
 - 3. AESS 3: Feature elements viewed at a distance less than 20 feet (feature elements in close view).

4. AESS 4: Showcase elements with special surface and edge treatment beyond fabrication (showcase elements).

2.03 PAINT SYSTEM

- A. Compatibility: All components/procedures of AESS paint system to comply with coating system specified, submitted, and approved per Section 09 91 00. As a minimum, identify required surface preparation, primer, intermediate coat (if applicable), and finish coat. Primer, intermediate coating, and finish coating to be from a single manufacturer combined in a system documented by manufacturer with adequate guidance for fabricator to procure and execute.
- B. Primer: As specified in Section 09 91 00. Primer to comply with all federal standards for VOC, lead and chromate levels.
- C. Primer: Organic, epoxy/zinc rich meeting class B surface requirements for slip critical connections, as found in AISC 360. Primer to comply with all federal standards for VOC, lead and chromate levels.
- D. Finish Coating: Field apply intermediate and top coats per Section 09 91 00.

2.04 SHOP PRIMING

- A. Surface Preparation:
 1. Provide surface preparations to meet SSPC-SP 6.
 2. Coordinate required surface profile with approved paint submittal prior to beginning surface preparation.
 3. Prior to blasting, remove any grease and oil using solvent cleaning to meet SSPC-SP 1.
 4. Remove weld spatter, slivers and similar surface discontinuities.
 5. Ease sharp corners resulting from shearing, flame cutting or grinding.
- B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted with slip-critical connections.
 1. Extend priming of members partially embedded in concrete or mortar to a depth of 2 inches.
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's instructions to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 2. Apply two coats of shop primer to surfaces that are inaccessible after assembly or erection.

2.05 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by hot-dip process to AESS indicated for galvanizing according to ASTM A123/A123M. Fabricate such that all connections of assemblies are made in the field with bolted connections where possible.

2.06 MATERIALS

- A. General: Meet requirements of 05 12 00 as amended below.
- B. Tension Control, High-Strength Bolts, Nuts, and Washers: Per section 05 12 00, Tension Control Bolts. Provide standard carbon steel finish rounded bolt heads with twist off bolts; ASTM F3125/F3125M.

2.07 SOURCE QUALITY CONTROL

- A. See Section 01 41 00 - Regulatory Requirements, for additional requirements.
- B. Structural Requirements:
 1. Comply with quality control requirements per AISC 360, Chapter N and AISC 303, Section 10. Refer to Section 05 12 00 for additional requirements.
 2. Quality assurance agency to review work for compliance with requirements of AISC 360, Chapter N and AISC 303, Section 10.

- C. AESS 1 and 2 Acceptance: MBI Companies to observe AESS in the shop at a viewing distance consistent with final installation and determine acceptability based on qualification data and submittals. Quality assurance agency has no responsibility for enforcing requirements related to aesthetic effect.
- D. AESS 3,4, and C Acceptance: MBI Companies to observe AESS in the shop at a viewing distance consistent with final installation and determine acceptability based on approved mock-up. Quality assurance agency has no responsibility for enforcing requirements related to aesthetic effect.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Erector to check all AESS members upon delivery for twist, kinks, gouges or other imperfections which may result in rejection of appearance of member. Coordinate remedial action with fabricator prior to erecting steel.

3.02 PREPARATION

- A. Provide connections for temporary shoring, bracing and supports only where noted on approved fabrication documents. Temporary connections not shown are to be made at locations not exposed to view in final structure or as approved by MBI Companies.
- B. Handle, lift and align pieces using nylon straps or chains with softeners required to maintain appearance of AESS through process of erection.

3.03 ERECTION

- A. AESS 1 and 2: Basic elements; feature elements not in close view:
 - 1. Employ special care to handle and erect AESS. Erect finished pieces using nylon straps or chains with softeners such that they are not damaged.
 - 2. Place weld tabs for temporary bracing and safety cabling at points concealed from view in completed structure or where approved by MBI Companies during pre-installation meeting. Obtain MBI Companies approval of methods for removing temporary devices and finishing AESS members prior to erection.
 - 3. AESS Erection Tolerances: Erect to standard frame tolerances for structural steel per Chapter 7 of AISC 303.
 - 4. Set AESS accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
 - 5. Remove blemishes or unsightly surfaces resulting from temporary braces or fixtures.
 - 6. Remove all backing and run out tabs.
 - 7. When temporary braces or fixtures are required to facilitate erection, take care to avoid any blemishes, holes or unsightly surfaces resulting from use or removal of such temporary elements.
 - 8. Bolted Connections: Align bolt heads on same side of connection as indicated on approved fabrication or erection documents.
 - 9. Welded Connections: Comply with AWS D1.1/D1.1M and Section 05 12 00. Appearance and quality of welds to be consistent. Employ methods that will maintain alignment of members without warp exceeding tolerance of this section.
 - 10. Remove weld spatter exposed to view.
 - 11. Grind off projections larger than 1/16 inch at field butt and plug welds.
 - 12. Continuous Welds: Where continuous welding is noted on drawings, provide continuous welds of a uniform size and profile.
 - 13. Do not enlarge holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts. Replace connection plates that are misaligned where holes cannot be aligned with acceptable final appearance.
 - 14. Splice members only where indicated.
 - 15. Obtain permission for any torch cutting or field fabrication from MBI Companies. Finish sections thermally cut during erection to a surface appearance consistent with mock-up.
- B. AESS 3: Feature elements in close view:
 - 1. Erect to requirements of AESS 1 and 2 and as follows:
 - 2. Field Welding: Weld profile, quality, and finish to be consistent with mock-ups approved prior to fabrication.
 - 3. Provide a continuous appearance to all welded joints including tack welds. Provide joint filler at intermittent welds.

- C. AESS 4: Showcase elements:
 - 1. Erect to requirements of AESS 3 and as follows:
 - 2. Grind welds smooth.
 - 3. Minimize Weld Show Through: At locations where welding on far side of an exposed connection creates distortion, grind distortion and marking of steel to a smooth profile with adjacent material.
 - 4. Filling of Weld Access Holes: Where holes must be cut in web at intersection with flanges on W shapes and structural tees to permit field welding of flanges, fill holes with joint filler.
 - 5. Where welds are indicated to be ground, contoured, or blended, oversize welds as required and grind to provide a smooth transition and match profile on approved mock-up.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Structural Requirements:
 - 1. Comply with quality control requirements per AISC 360, Chapter N and AISC 303, Section 10. Refer to Section 05 12 00 for additional requirements.
 - 2. Quality assurance agency to review work for compliance with requirements of AISC 360, Chapter N and AISC 303, Section 10.
- C. AESS 1 and 2 Acceptance: MBI Companies to observe AESS in place and determine acceptability based on qualification data and submittals. Quality assurance agency has no responsibility for enforcing requirements related to aesthetic effect.
- D. AESS 3,4, and C Acceptance: MBI Companies to observe AESS in place and determine acceptability based on qualification data and submittals as well as on approved mock- up. Quality assurance agency has no responsibility for enforcing requirements related to aesthetic effect.

3.05 CLEANING

- A. Touch-up Painting: Complete cleaning and touch-up painting of field welds, bolted connections, and abraded areas of shop paint to blend with adjacent surfaces of AESS. Perform touch-up work in accordance with manufacturer's instructions and as specified in Section 09 91 00.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas. Repair galvanized surfaces in accordance with ASTM A780/A780M.
- C. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Furnish all labor, materials, equipment, and supervision to design, fabricate, deliver, and install steel joists as shown on the drawings and specified herein.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 DEFINITIONS:

- A SJI "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."
- B Special Joists: Steel joists or joist girders requiring modification by manufacturer to support non-uniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.04 SUBMITTALS:

- A Meet the requirements of Structural Shop Drafting by AISC for shop drawings.
- B Provide calculations and/or certifications showing compliance with all design criteria stated in these specifications and noted in the Drawings.
- C Product Data: For each type of joist, accessory, and product indicated.
- D Shop Drawings: Show layout, designation, number, type, location, and spacing of joists. Include joining and anchorage details, bracing, bridging, joist accessories; splice and connection locations and details; and attachments to other construction.
 - 1. Indicate locations and details of bearing plates to be embedded in other construction.
 - 2. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.
- E Manufacturer Certificates: Signed by manufacturers certifying that joists comply with requirements.
- F Mill Certificates: Signed by bolt manufacturers certifying that bolts comply with requirements.

1.05 QUALITY ASSURANCE:

- A Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables of SJI "Specifications."
 - 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- B SJI Specifications: Comply with standard specifications in SJI's "Specifications" that are applicable to types of joists indicated.
- C Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.06 SPECIAL INSPECTIONS:

- A The Owner will engage a qualified Special Inspector to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.

- B Field welds will be visually inspected according to AWS D1.1/D1.1M.
- C In addition to visual inspection, field welds will be tested according to AWS D1.1/D1.1M and the following procedures, as applicable if noted on the drawings:
1. Radiographic Testing: ASTM E 94.
 2. Magnetic Particle Inspection: ASTM E 709.
 3. Ultrasonic Testing: ASTM E 164.
 4. Liquid Penetrant Inspection: ASTM E 165.
- D Bolted connections will be visually inspected.
- E High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts."
- F Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.
- G Additional testing will be performed to determine compliance of corrected Work with specified requirements.
- 1.07 DELIVERY, STORAGE, AND HANDLING:
- A Deliver, store, and handle joists as recommended in SJI's "Specifications."
- B Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.
- 1.08 SEQUENCING:
- A Deliver steel bearing plates to be built into cast-in-place concrete and masonry construction.

PART II PRODUCTS

- 2.01 JOISTS:
- A Design joists for the loads indicated on the Drawings.
- B Use SJI standard camber unless the Drawings indicate otherwise; negative camber is unacceptable.
- 2.02 FASTENERS:
- A ASTM A325 or A490 structural bolts, nuts and hardened washers.
- 2.03 BRIDGING:
- A Standard of joist manufacturer, except as noted otherwise on the drawings.
- 2.04 SHOP PRIMER:
- A Light gray chromate or red oxide primer, 2 mil dry thickness.
- 2.05 MATERIALS
- A Steel: Comply with SJI's "Specifications" for web and steel-angle chord members.
- B Steel Bearing Plates: ASTM A 36/A 36M.
- C Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.

1. Finish: Plain, uncoated
- D High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.
1. Finish: Plain.
- E Welding Electrodes: Comply with AWS standards.
- 2.06 PRIMERS
- A Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.
- 2.07 K-SERIES STEEL JOISTS
- A Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
1. Joist Type: K-series steel joists and KCS-type K-series steel joists.
- B Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.
- C Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- D Provide holes in chord members for connecting and securing other construction to joists.
- E Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."
- F Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."
- G Camber joists according to SJI's "Specifications."
- H Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).
- 2.08 LONG-SPAN STEEL JOISTS
- A Manufacture steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as follows:
1. Joist Type: LH-series steel joists and DLH-series steel joists.
 2. End Arrangement: Underslung /Square as noted on drawings.
 3. Top-Chord Arrangement: Parallel.
- B Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- C Provide holes in chord members for connecting and securing other construction to joists.
- D Camber long-span steel joists according to SJI's "Specifications."

- E Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.09 JOIST GIRDERS

- A Manufacture joist girders according to "Standard Specifications for Joist Girders" in SJI's "Specifications," with steel-angle top- and bottom-chord members; with end and top-chord arrangements as follows:
 - 1. End Arrangement: Underslung with bottom-chord extensions or as noted on the drawings.
 - 2. Top-Chord Arrangement: Parallel.
- B Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- C Provide holes in chord members for connecting and securing other construction to joist girders.
- D Camber joist girders according to SJI's "Specifications".
- E Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.10 JOIST ACCESSORIES

- A Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.
- B Steel bearing plates with integral anchorages are specified in Division 5 Section "Metal Fabrications."
- C Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch (13 mm) of finished wall surface, unless otherwise indicated.
- D Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

2.11 CLEANING AND SHOP PAINTING

- A Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B Do not prime paint joists and accessories to receive sprayed fire-resistive materials.
- C Apply 1 coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick.

PART III EXECUTION

3.01 EXAMINATION:

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

3.02 FABRICATION:

- A Fabricate joists completely in the shop according to the latest SJI standards.
- B Joists may be fabricated from hot or cold formed sections of strip or sheet steel.

3.03 INSTALLATION:

- A Do not start placement until supporting work is in place and secured.
- B Install and secure joists and permanent bridging before construction loading. Provide for distribution of temporary loading. Bar joists and joist girders to be erected per OSHA 1926.750.
- C Joists shall bear not less than 4 inches on masonry or concrete and not less than 2-1/2 inches on steel.
- D Coordinate the delivery of products with that of other materials. Avoid damage during unloading, storing, or erecting. Replace damaged joists.
- E Leave members clean. Touch up the shop coat in the field.
- F Do not install joists until supporting construction is in place and secured.
- G Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.
 - 1. Before installation, splice joists delivered to Project site in more than one piece.
 - 2. Space, adjust, and align joists accurately in location before permanently fastening.
 - 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
 - 4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads have been applied.
- H Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- I Bolt joists to supporting steel framework using high-strength structural bolts. Comply with RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
- J Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.04 REPAIRS AND PROTECTION:

- A Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists abutting structural steel, and accessories.
 - 1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
 - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- C Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A The work required under this specification consists of all steel roof decking.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 05 12 00 - Structural Steel.
Section 05 21 00 - Steel Joists.
Section 09 91 00 – Painting.

1.03 CODES AND STANDARDS:

- A Comply with the provisions of the following codes and standards:

1. AISI “Specification for the Design of Cold-Formed Steel Structural Members” (Standard Specifications).
2. AWS D1.3 “Structural Welding Code-Steel” and AWS D1.3 “Structural Welding Code – Sheet Steel”.
3. ASTM A-611.

1.04 SUBMITTALS:

- A For information only, submit 2 copies of manufacturer’s specifications and installation instructions for each product specified. Include manufacturer’s certification as may be required to show compliance with these specifications. Indicate by transmittal form that a copy of each instruction has been distributed to the Installer.
- B Submit detailed shop drawings showing layout and types of deck panels, anchorage details, and every condition requiring closure panels, supplementary framing, cut openings, special jointing or other accessories.

PART II PRODUCTS

2.01 STEEL ROOF DECK:

- A Steel roof deck units shall be fabricated from steel conforming to Section 1.2 of the latest edition of the Standard Specifications.
- B Deck to be Type “B” or “F”. Decks indicated for applicable acoustic properties to be Type “BA”.
- C Depth, gauge, and finish shall be as specified on the drawings.

PART III EXECUTION

3.01 INSPECTION:

- A Installer must examine the areas and conditions under which deck is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION:

- A All new roof areas shall be covered with steel roof deck unless noted otherwise in the Drawings.
- B Form metal units in lengths to be supported by 3 or more supports, where applicable, with lapped ends (2" minimum) and nested side laps. Units shall be erected and welded to supports in accordance with manufacturer's specifications in a pattern as noted on the drawings.
- C Place form units on supporting steel framework and adjust to final position with ends bearing on supporting members and accurately aligned before being permanently fastened. Do not stretch or contract side lap interlocks. Place units flat and square without warp or excessive deflection.
- D Place deck bundles in such a manner as to not exceed allowable load capacity of structural framing.
- E Do not use deck units for storage or working platforms until permanently secured and do not exceed manufacturer's specified load capacity of deck.
- F Reinforce deck at openings without structural supports along all edges by means of one piece, flat sheet of 18 gauge (min.) of material of the same type and finish as the deck. Reinforcing shall be a minimum of at least 12" wide. Weld reinforcing to the forms at each corner and at intervals not exceeding 6" o.c.
- G Comply with AWS requirements and procedures for welding.
- H After installation, clean and patch the finish of scarred, welded, or rusted areas of the forms and supporting structure.

END OF SECTION

PART I GENERAL

1.01 SCOPE

- A Furnish all labor, material, equipment and supervision necessary to furnish and install gypsum sheathing and structural metal stud framing and fasteners at all exterior walls as specified herein as shown on the drawings and as specified herein.
1. Furnish and install structural metal stud fabricated roof trusses.
 2. Furnish and install air infiltration barrier and flexible flashing at window openings.
 3. Insulate voids in metal stud assemblies during fabrication which would be inaccessible for installation of insulation at a later date.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 07 21 00 – Thermal Insulation.
Section 09 21 16 – Gypsum Board Assemblies.
Division 26 – Electrical.
Division 27 – Communications.

1.03 SUBMITTALS:

- A Submit Manufacturer's data on sheathing and framing in accordance with Section 01 30 00.

1.04 QUALITY ASSURANCE:

- A This project has been designed based on allowable loads and construction standards of (SSMA) Steel Stud Manufacturer's Association. To be considered as an equal product, the Contractor shall submit product data, installation details, and any other supplemental information required by the Structural Engineer in accordance with Section 01 30 00.
- B Structural steel studs shall be inspected by the Architect before they are to be concealed.
- C All structural steel studs and joists shall be factory color coded to provide a suitable visible means of field checking for proper location of gauge material.
- D Installer Qualifications: An experienced installer who has completed cold-formed metal framing 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.
- E Splices in studs shall not be permitted.
- F Engineering Responsibility: Engage a qualified professional engineer to prepare design calculations, Shop Drawings, and other structural data.
- G 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 cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- H Mill certificates signed by steel sheet producer or test reports from a qualified independent testing agency indicating steel sheet complies with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and galvanized-coating thickness.

- I Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- J AISI Specifications: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" or "Load and Resistance Factor Design Specification for Cold-Formed Steel Structural Members" and the following for calculating structural characteristics of cold-formed metal framing:
1. CCFSS Technical Bulletin: "AISI Specification Provisions for Screw Connections."
- 1.05 PERFORMANCE REQUIREMENTS:
- A Structural Performance: Provide cold-formed metal framing capable of withstanding design loads indicated on the drawings within limits and under conditions indicated.
- B Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
1. Exterior Load-Bearing Wall Framing: Horizontal deflection of $L/360$ of the wall height.
 2. Exterior Load-Bearing Wall Framing With Brick Veneer: Horizontal deflection of $L/600$ of the wall height.
 3. Roof Trusses: Vertical deflection of $1/240$ of the span.
- C Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120° F .

PART II PRODUCTS

2.01 MATERIALS:

- A Steel Sheet: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 33, Class 1.
 2. Grade: 33 for minimum uncoated steel thickness of 0.0428 inch and less; 50 Class 1 for minimum uncoated steel thickness of 0.0538 inch (1.37 mm) and greater.
 3. Coating: G60.
- B All members shall be designed in accordance with American iron and Steel institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members".
- C All framing members shall be formed from corrosion-resistant steel, corresponding to the requirements of AS5M A653, with a minimum yield strength of 40 ksi for studs, 33 ksi for runners.
- D Top and bottom track are to be the same gauge as the studs.
- E Framing members not scheduled otherwise on the drawings shall be not than less than 43 mils.
- F Steel studs shall be of size and gauge shown on the drawings. Studs not sized on the drawings shall be a minimum of 43 mils.

2.02 AIR-INFILTRATION BARRIER:

- A Proprietary building wrap with flame-spread and smoke-developed ratings of less than 25 and 450, respectively, when tested according to ASTM E 84. Provide one of the following products:
1. Spun Bonded Polyethylene sheet with aluminum coating on one face, formed by spinning continuous strands of fine, high-density-polyethylene interconnected fibers and bonding them together by heat and pressure; incorporating an additive to provide ultraviolet light resistance for

up to 120 days; and with a water-vapor transmission rate equaling 535 g through 1 sq. m of surface in 24 hours according to ASTM E 96, Desiccant Method (Method A).

- a. Product: Subject to compliance with requirements, provide "Tyvek ThermaWrap™" by DuPont Company.
 2. Effective R-value: R-2 (including 3/4" minimum airspace), as designated on ASHRAE tables, ASTM Handbook of Fundamentals, Chapter 25- Table 3.
 3. Air Penetration: 0.001 cfm/ft² at 1.57 psf, when tested in accordance with ASTM E 2178.
 4. Water Vapor Transmission: 36 perms, when tested in accordance with ASTM E 96, Method B.
 5. Water Penetration Resistance: 210 cm when tested in accordance with AATCC Test Method 127.
 6. Basis Weight: 2.6 oz/yd², when tested in accordance with TAPPI Test Method T-410.
 7. Air Resistance: Air infiltration at >1000 seconds, when tested in accordance with TAPPI Test Method T-460.
 8. Tensile Strength: 29/27 lbs/in., when tested in accordance with ASTM D 882, Method A.
 9. Tear Resistance: 12/7 lbs., when tested in accordance with ASTM D 1117.
- B. Accessories:
1. Seam Tape: DuPont™ Tyvek® Metallized Tape or DuPont™ Tyvek® Tape as manufactured by DuPont.
 - a. Fasteners:
 - i. Steel Frame Construction: Tyvek® Wrap Cap Screws, as manufactured by DuPont: 1-5/8 inch rust resistant screw with 2-inch diameter plastic cap fasteners.
 - ii. Wood Frame Construction: Tyvek® Wrap Caps, as manufactured by DuPont Building Innovations: #4 nails with large 1-inch plastic cap fasteners or 1-inch cap staples.
 - b. Sealants : Provide sealants as recommended by the weather barrier manufacturer that comply with ASTM C 920, elastomeric polymer sealant to maintain watertight conditions.
 - c. Adhesives: Provide adhesive recommended by weather barrier manufacturer.
- C. Flashing: DuPont™ FlexWrap™, as manufactured by DuPont or other approved flexible membrane flashing materials for window openings and penetrations.
- 2.03 FRAMING ACCESSORIES:
- A Fabricate steel-framing accessories of the same material and finish used for framing members, with a minimum yield strength of 33,000 psi (230 MPa).
- B Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
1. Supplementary framing.
 2. Bracing, bridging, and solid blocking.
 3. Web stiffeners.

4. End clips.
 5. Gusset plates.
 6. Joist hangers and end closures.
- 2.04 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.
- B Anchor Bolts: ASTM F 1554, Grade 36 threaded carbon-steel headless, hooked 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 Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.
1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- D Welding Electrodes: Comply with AWS standards.
- 2.05 MISCELLANEOUS MATERIALS:
- A Galvanizing Repair Paint: SSPC-Paint 20
- 2.06 FABRICATION:
- A Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.
1. Fabricate framing assemblies using jigs or templates.
 2. Cut framing members by sawing or shearing; do not torch cut.
 3. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
 4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- B Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
1. Spacing: 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.
 2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.
- D. Insulate Voids in built-up components: Stuff glass-fiber loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume to a density equaling approximately 2.5 lb/cu. ft. (40 kg/cu. m).

1. Contractor may use Foamed in place insulation in lieu of glass fiber insulation to insulate voids in built-up components.
 - a. Foamed-In Place Insulation: Two component thermal insulation combining a plastic resin and catalyst foaming agent surfactant, properly mixed/rationed and combined with compressed air to produce a cold-setting foam insulation in cores of hollow concrete masonry walls.
 - i. Thermal Values: Provide "R" 3.7 per inch min. @ 32 degrees F. mean.
 - ii. Density: Dry 0.5 lb/ft³.
 - iii. Flame Spread: 25
 - iv. Smoke Developed: < 450
 - v. Permeance at 3.5 inches thickness: 7.7 perms per inch or less per ASTM E96.
 - vi. Corrosion: Non-corrosive.
 - vii. Toxicity: Non-toxic.
2. Acceptable Manufacturers:
 - a. PolyMaster, Inc. "PolyMaster® Incylthane 500".
 - b. Tailored Chemical Products, Inc. "Core-Fill 500".

PART III EXECUTION

3.01 FRAMING:

- A Prior to fabrication of framing, the contractor shall submit fabrication and erection drawings to the architect.
- B All framing components shall be cut squarely for attachment to perpendicular members, or as required, for an angular fit against abutting members.
- C Axially loaded studs shall be installed in a manner which will assure that their ends are positioned against the inside of runner web prior to fastening.
- D Fastening of components shall be with self-drilling screws or welding. Screws shall be of sufficient size to insure the strength of the connection. Wire typing of components shall not be permitted. All welds shall be touched up with a zinc-rich paint.
- E Coordinate with Plumbing, Mechanical, Electrical, and Communications Subcontractors to build-in required blocking for wall mounted equipment and devices.

3.02 WALL FRAMING INSTALLATION:

- A Runners and studs shall be securely anchored to the supporting structure. Complete, uniform and level bearing support shall be provided for bottom runner.
- B Abutting lengths of runner shall each be securely anchored to a common structural element, butt-welded or spliced.
- C Studs shall be plumbed, aligned and securely attached to flanges of both upper and lower runners. Framing of wall openings shall include headers and supporting studs.
- D Temporary bracing, where required, shall be provided until erection is completed.
- E Resistance to bending and rotation about the minor axis shall be provided by sheathing per AISI Specification, Sec. 5.1, and diagonally brace stud wall at all corners (horizontal strap or cold-rolled channel bracing.) Additional studs, when necessary, shall be positioned as to resist the vertical components.

- F Splices in studs and cutouts in the flanges of studs shall not be permitted.
- G Provide additional bracing and anchorage as noted on the drawings.
- H Apply 4 foot wide gypsum sheathing vertically with long edges over studs with face out. Screw attach gypsum sheathing with 1 inch type screws spaced 3/8" from edges and approximately 8" O.C. at edges and in the field, unless otherwise noted on the drawings.
- I Provide slip connections allowing for vertical movement (1/2" unless noted otherwise on the drawings) of the structure without imposing vertical loads on non-load bearing studs. Submit process and detail prior to installation.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Furnish all labor, materials, tools, equipment, coordination, supervision services, etc., as required for complete performance of the work as shown on the drawings and specified herein.
- B In General this Section Includes the Following: Fabricate and deliver rough hardware, steel stair framing and stair handrails, and other miscellaneous shop fabricated steel items not supplied with other supplied steel fabrications.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 05 12 00 - Structural Steel.

1.03 SUBMITTALS:

- A Shop drawings detailing fabrication and erection of each metal fabrication. Include plans, elevations, sections and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections. Welder's certificates signed by Contractor certifying that welders comply with requirements specified herein.

1.04 QUALITY ASSURANCE:

- A Fabrication firm shall have experience at successfully producing metal fabrications similar to those indicated, and have sufficient production capacity to produce required work without causing delay.
- B Installation of each item shall be performed by same firm that fabricated them.
- C Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel", D1.3 "Structural Welding Code - Sheet Steel".
- D Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved, and if pertinent, has undergone re-certification.

PART II PRODUCTS

2.01 MATERIALS:

- A Cast Iron: Clean, tough gray iron free from blow holes, cinder spots or cold shuts. Conforming to ASTM Specifications.
- B Wrought Iron: (1) Plates, ASTM A52; Sheet, ASTM A162; and Bolts, Rods, Bars, ASTM A141.
- C Structural Steel: ASTM A36.
- D Aluminum: Type recommended by manufacturer unless specifically noted.

2.02 SHOP PAINT:

- A All ferrous metal items shall be painted one coat of rust inhibitive shop primer except those with galvanized finish or to be embedded in concrete or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA1 "Paint Application specification No. 1" for shop painting.

2.03 BOLTS AND ANCHORS:

- A Furnish and install all bolts, anchors, expansion bolts, etc., as needed to properly install all items of work, including woodwork, etc.
- B Joints: Tightly fitted, finished smooth and even concealed where possible, rivets countersunk on exposed surfaces. No drifting.
 - 1. Steel: Riveted or welded.
 - 2. Castings: Concealed bolts or cap screws counter-sunk on face.
 - 3. Wrought Iron: Welded or machine screws.
 - 4. Exterior Work: Shed water and prevent entrance to hollow work.
 - 5. Aluminum: Welded, ground and buffed for flush machine screws.

2.04 EQUIPMENT SUPPORTS:

- A Provide equipment supports of structural shapes where shown and as detailed and where not furnished by equipment contractors.

2.05 STEEL LINTEL ANGLES FOR OPENINGS IN MASONRY:

- A Unless otherwise shown, loose lintels shall be 16 inches larger than the masonry to masonry opening over which they occur. Unless otherwise shown, they shall be 6 inch by 3-1/2 inch by 3/8 inch angles, one for each 4 inches of wall thickness. Furnish other miscellaneous structural shapes to be built by masons or other trades which are not elsewhere specified.

2.06 GROUT AND ANCHORING CEMENT:

- A Non-Shrink, Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CECRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
- B Interior Anchoring Cement: Factory-prepackaged, non-shrink, non-staining, hydraulic controlled expansion cement formulation for mixing with water in field to create pourable anchoring, patching, and grouting compound. Use for interior applications only.
- C Erosion Resistant Anchoring Cement: Factory-prepackaged, non-shrink, non-staining, hydraulic controlled expansion cement formulation for mixing with water in field to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without need for protection by sealer or waterproof coating and is recommended for exterior use by manufacturer.
- D Subject to compliance with requirements, acceptable products include, but are not limited to, the following:
 - 1. Non-Shrink, Non-Metallic Grouts:
 - a. "Bonsal Construction Grout": W.R. Bonsal Co.
 - b. "Diamond-Crete Grout": Concrete Service Materials
 - c. "Euco N-S Grout": Euclid Chemical Co.
 - d. "Kemset": Chem-Masters Corp.
 - e. "Crystex": L & M Construction Chemicals, Inc.
 - f. "Masterflow 713": Master Builders
 - g. "Sealtight 588 Grout": W.R. Meadows, Inc.
 - h. "SonogROUT": Sonneborn Building Products Div. Rexnord Chemical Products Inc.
 - i. "Five Star Grout": U.S. Grout Corp.
 - j. "Vibropruf #11": Lambert Corp.

2. Interior Anchoring Cement:
 - a. "Bonsal Anchor Cement": W.R. Bonsal Co.
 - b. "Pro-Rok": Minwax Construction Products Div.
 - c. "Masterflow 928 and 713": Master Builders
 - d. "Euco N-S Grout": Euclid Chemical Co.
 - e. "Sealtight 588 Grout": W.R. Meadows Inc.
3. Erosion -Resistant Anchoring Cement:
 - a. DRYLOK FastPlug Hydraulic Cement: UGL.
 - b. Super Por-Rok: CGM Building Products.

2.07 FASTENERS:

- A Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for their intended use, type, grade, and class required.
1. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
 2. Lag Bolts: Square head type, FS FF-B-561.
 3. Machine Screws: Cadmium plated steel, FS FF-S-92.
 4. Wood Screws: Flat head carbon steel, FS FF-S-111.
 5. Plain Washers: Round, carbon steel, FS FF-W-92.
- B Drilled-In Expansion Anchors: Complying with FS FF-S-325, Group VIII (anchors, expansions, {non-drilling}), Type I (internally threaded tubular expansion anchor), and machine bolts complying with FS FF-B575, Grade 5.
1. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.
 2. Lock Washers: Helical spring type, carbon steel, FS FF-W-84.
 3. Ferrous Metal Shop Primer: Manufacturer's or Fabricator's standard, fast-curing, lead-free, universal modified alkyd primer; selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645
 4. Galvanized Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint-20.
 5. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint-12 except containing no asbestos fibers.

2.08 FABRICATION:

- A Fabricate items from materials of size, thickness, and shapes indicated by not less than that required to comply with performance indicated. Work to dimensions indicated or accepted on shop drawings, using proven details for fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
- B Fabricate exposed work true to line and level, with accurate angels and surfaces, and straight sharp edges.
- C Allow for thermal movement through a maximum ambient temperature change (range) of 100° F (55.5° C) in the design, fabrication, and installation of assemblies, without buckling, opening up of joints, and overstressing of welds of welds and fasteners. Base design calculations of actual surface temperatures of metals due to both solar heat gain and night time heat loss.
- D Shear and punch metals cleanly and accurately. Remove burrs.

- E Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- F Remove sharp or rough areas on exposed traffic surfaces.
- G Weld corners and seams continuously, complying with AWS recommendations and 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 that no roughness shows after finishing, and contour of welded surface matches those adjacent.
- H Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- I Provide anchorages of types indicated, coordinated with supporting substrates. Fabricate and space anchoring devices to provide adequate support for intended use.
- J Assemble items in shop to greatest extent possible. Partially fabricate only as necessary for shipping and handling limitations. Employ connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- K Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
- L Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weeps where water may collect.
- 2.09 ROUGH HARDWARE:
- A Furnish/fabricate bent or otherwise custom fashioned bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing/supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Furnish straight bolts and other stock rough hardware items as specified in DIVISION 6 Sections.
- B Fabricate items to sizes shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, provide steel washers.
- 2.10 BEARING AND LEVELING PLATES:
- A For steel items bearing on masonry or concrete, provide loose bearing and leveling plates, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.
- 2.11 FINISHES, GENERAL:
- A Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.
- B Finish metal fabrications after assembly.
- 2.12 STEEL AND IRON FINISHES:
- A Galvanizing: For items indicated to be galvanized, apply zinc-coating by the hot-dip process in compliance with the following requirements:

1. ASTM A 153 for galvanizing iron and steel hardware.
 2. ASTM A 123 for galvanizing both fabricated and unfabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299 inch thick and heavier.
- B Prepare uncoated ferrous metal surfaces for shop priming in compliance with the following requirements for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
1. Exteriors (SSPC Zone 1B): SSPC-SP6 “Commercial Blast Cleaning”.
 2. Interiors (SSPC Zone 1A): SSPC-SP3 “Power Tool Cleaning”.
- C Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finish or to be embedded in concrete or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA1 “Paint Application Specification No. 1” for shop painting.

PART III EXECUTION

3.01 INSTALLATION:

- A Install anchorage devices and fasteners necessary for securing miscellaneous metal fabrications to substrates; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required.
- B Perform cutting, drilling and fitting for installation of miscellaneous metal fabrications. From established lines and levels, locate and align fabrication accurately, at proper elevation, with edges and surfaces level, plumb, true and free of rack.
- C Temporarily brace anchors which are to be built into concrete, masonry or similar construction.
- D Fit exposed connections accurately together to form hairline joints. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior galvanized items, and those intended for bolted or screwed field connections.
- E For field welds, comply with AWS Code for procedures of manual shielded metal-arc welding, in appearance and quality of welds made, and methods used in correcting welding work.
- F Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
- G Obtain fusion without undercut or overlap. Remove welding flux immediately.
- H At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour matches adjacent surface.

3.02 SETTING LOOSE PLATES:

- A Clean concrete and masonry bearing surfaces of foreign matter and roughen to improve bonding. Clean bonding surface of bearing plates.
- B Set plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. do not remove shims; if protruding, cut-off flush with edge of bearing plate before packing with grout. Pack grout leaving no voids between bearing surface and plate.
- C Use metallic non-shrink grout in concealed locations where not exposed to moisture; use non-metallic, non-shrink grout in exposed locations, unless otherwise indicated.

3.03 ADJUSTING AND CLEANING:

- A Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint and paint exposed areas with same materials as used for shop painting. Comply with SSPC-PA1 requirements for touch-up of field painted surfaces. Apply by brush or spray to provide a minimum dry thickness of 2.0 mils.
- B Clean field welds, bolted connections and abraded areas of galvanized items and apply galvanizing repair paint in compliance with ASTM A 780.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A. Furnish all labor, materials, equipment and supervision necessary to perform all work traditionally performed by Carpenter including furnishing and installing rough carpentry as herein specified and shown on the drawings as necessary to complete the work.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 06 41 00 – Architectural Wood Casework.

Section 09 91 00 – Painting.

1.03 SUBMITTALS:

- A. Submit shop drawings on fabricated items.
- B. Pressure treated wood: Submit certification by treating plant stating chemicals and process used, net amount of salts retained, and conformance to applicable standards.
- C. Preservation treated wood: Submit certification for waterborne preservative that moisture content was reduced to moisture content specified elsewhere in this section.

1.04 REFERENCES:

- A. Applicable Standards:
 - 1. American Plywood Association (APA), current standards.
 - 2. American Society for Testing and Materials (ASTM), standards as referenced herein.
 - 3. American Wood Preservers Association (AWPA), standards as referenced herein.
 - 4. Product Standards (PS) of the National Bureau of Standards, U.S. Department of Commerce, PS 20-99 for softwood lumber and PS 1-83 for softwood plywood.
- B. Grading rules; current rules of the following associations applicable to wood materials:
 - 1. Southern Pine Inspection Bureau (SPIB).
 - 2. Western Wood Products Association (WWPA).
 - 3. West Coast Lumber Inspection Bureau (WCLIB).
 - 4. National Lumber Grades Authority (NLGA).

1.05 QUALITY ASSURANCE:

- A. Lumber: Lumber shall bear the grade stamp of a listed grading rules association certified by the Board of Review of the American Lumber Standards Committee (ALSC), identifying species or species combination, grade, moisture content at time of surfacing, mill origin and grading agency.
- B. Plywood: Plywood shall bear the stamp of American Plywood Association (APA), indicating type, grade, thickness, exposure durability, span rating, species group, edging, surface finish, and regulatory agency compliance.
- C. Pressure-preservative-treated wood materials: Pressure-preservative-treated lumber and plywood shall bear the quality standard stamp of the applicator indicating compliance with AWPA standards, preservative type used, retention level, exposure conditions, treating company and plant location, year of treatment and name of certified treatment inspection agency.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to project site and place in areas protected from the weather.
- B. Store materials minimum 6" off of ground or floor on level blocking. Cover with waterproof sheets or tarps if stored outdoors. Provide for adequate air circulation and ventilation when covering materials. Do not store seasoned materials in wet or damp areas of building.
- C. Protect edges, ends, corners and surfaces of sheet materials from damage.

PART II PRODUCTS

2.01 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.
- B. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
- C. Framing: Grade No. 1 of any species with the required modulus of elasticity and extreme fiber stress in bending as indicated on structural drawings or approved by Engineer.

2.02 BOARDS

- A. Concealed Boards: Where boards will be concealed by other work, provide lumber with 15 percent maximum moisture content and of on of the following species and grade:
 - 1. Eastern softwoods, No. 3 Common per NELMA rules.
 - 2. Northern species, No. 3 Common or Standard per NLGA rules.
 - 3. Mixed southern pine, No. 2 per SPIB rules.
 - 4. Hem-fir, Standard per WCLIB rules or No. 3 Common per WWPA rules.
 - 5. Spruce-pine-fir, Standard per WCLIB rules or No. 3 Common per WWPA rules.
 - 6. Western woods, Standard per WCLIB rules or No. 3 Common per WWPA rules.

2.03 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.
- B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
- C. Moisture Content: 15 percent maximum for lumber items not specified to receive wood preservative treatment.
- D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.04 SHEET MATERIALS:

- A. Interior Plywood: Wall Surfaces: APA-rated A-D, Group 1, Interior, thickness as indicated; A-grade veneer face to exposed side.
- B. Exterior Plywood - Wall and/or Roof Sheathing: APA-rated Sheathing, Exposure 1, Span rating shall be as required for support spacing at each condition.

- C. Preservative-Treated Plywood: APA-rated Sheathing, Exposure 1, Series V-611, thickness as indicated; pressure-preservative-treated as specified herein.

2.05 TREATED WOOD MATERIAL:

- A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium: Alkaline Copper Quat (ACQ), or Copper Azole (CA type A or B)
 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or 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. For exposed lumber indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by inspection agency.
- D. Application: Treat items indicated on Drawings AND the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Wood floor plates, 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" above the ground in crawlspaces or unexcavated areas.
5. Where Preservative treated wood is used in contact with metal other than G-90 hot dipped galvanized steel, a separation sheet of either 15-pound unperforated organic asphalt saturated roofing felt complying with ASTM D -226, or 10 mil polyethylene shall be placed between wood and metal to prevent corrosion from contact.

2.06 FIRE RETARDANT TREATED LUMBER:

- A. Comply with AWPA C-27 as applicable. Process shall not promote premature degradation of wood products in the conditions in which fire-treated lumber/panels will be installed.
1. Provide materials with maximum moisture content, after treatment, of 15% or less.
 2. Manufacturer: Provide "Dricon FRT" or "D-Blaze FRT" by Chemical Specialties Inc., with current warranty.

2.07 HARDWARE AND ACCESSORIES:

- A. Fasteners and accessories: Provide nails, bolts, nuts, washers, screws, expansion bolts, lag bolts, clips, powder-actuated fasteners, anchor bolts and similar hardware necessary for complete installation of rough carpentry materials.
- B. Nails, fasteners and anchors for treated wood materials: Hot-dipped galvanized or type 304 or 316 stainless steel.
- C. Fasteners for attachment of plywood to light gage steel framing: Corrosion-resistant, type S-12 bugle head self-drilling screws; length as required to extend minimum 1/2" through framing member.

- D. Construction adhesive: meeting APA Performance Specification AFG-01.

PART III EXECUTION

3.01 WORKMANSHIP:

- A. Install rough carpentry work cut square and straight to provide neat, fitted joints. Set to required levels and lines with members plumb, true, and aligned.
- B. Coordinate and lay out work to provide correct locations and opening to receive work of other trades.
- C. Install framing members aligned, leveled, plumbed and squared over bearing points.
- D. Secure carpentry work in place to substrates and supporting members using fasteners of types and sizes complying with building code requirements and as specified. Install fasteners without splitting wood and with positive anchorage into substrates or adjoining wood members.
- E. Anchor members rigid and secure to adequately resist design loads, maintaining proper alignment, free of warp or wind.
- F. Install linear runs of materials using longest lengths as practicable. Where multiple members are used to form linear runs, offset joints in member not less than three feet.
- G. Bolting: Drill holes 1/16" larger in diameter than bolt to be installed. Drill straight and true from one side only. Provide plates or washers between bolt head or nut and wood surface.
- H. Screws: Pre-bore holes same diameter as root of thread. Enlarge holes to shank diameter for length of shank.
- I. Make wood-to-wood fastenings with proper size cement coated nails.
- J. Install plywood and other sheet material in compliance with APA Design/Construction Guide - Residential and Commercial unless more stringent requirements are specified.

3.02 TREATED WOOD MATERIALS:

- A. Handle and install treated wood in accordance AWWA M4-84.
- B. Coat cut edges and ends of pressure-preservative-treated wood, including drilled holes with a brushed-applied solution of copper naphthenate containing minimum 2% metallic copper.
- C. Attach treated wood materials using hot-dipped galvanized or stainless steel fasteners, nails or anchors as specified.

3.03 PLATES, BLOCKING, NAILERS AND MISCELLANEOUS FRAMING:

- A. Install minimum 2" nominal thickness wood members to support and to provide as a substrate for attachment of finishing materials, trim, fixtures, accessories and specialty items. Cut blocking to fit snug between studs, wedge, align and anchor to framing by end nailing or toenailing.
- B. Anchor members to structural steel or metal framing using appropriate bolts spaced at 48" o.c. maximum.
- C. Anchor members to concrete or masonry construction using cast-in anchor bolts, powder-actuated studs or sleeve, wedge or expansion type anchors, spaced at 48" o.c. maximum.
- D. Provide linear members in maximum practical lengths to minimize joints. Install multiple linear members so joints are offset minimum 36".
- E. Install anchors and fasteners positioned to be located within 3" of ends of members.

- F. Attach furring at 12" o.c. to substrates with appropriate fasteners spaced at maximum, 24" o.c.
 - G. Wood Framed Walls: Install minimum 2" thickness solid wood blocking or framing members to firestop all vertical and horizontal concealed draft opening to comply with governing building code requirements. Firestopping members shall be of sizes matching full width or depth of framing or structural members. Walls exceeding eight feet in height shall be laterally braced with nominal 2" solid blocking, same width as studs, installed continuous in horizontal row at mid-point of wall height.
- 3.04 CLEAN UP:
- A. Clean up debris and excess materials from this work and remove from site. Leave area broom clean.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specially fabricated cabinet units.
- B. Plastic Laminate Countertops.
- C. Hardware.
- D. Factory finishing.
- E. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- B. Section 12 36 00 - Countertops.

1.03 REFERENCE STANDARDS

- A. ANSI/AWI 0641-2019 - Architectural Wood Casework Standard
- B. BHMA A156.9 - American National Standard for Cabinet Hardware; 2015.
- C. GSA CID A-A-1936 - Adhesive, Contact, Neoprene Rubber; 1996a (Validated 2013).
- D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.
- E. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- F. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 DEFINITIONS

- A. Premium Grade: The aesthetic grade defining the highest degree of control over materials, workmanship, and installation. Selectively used in the most visible and high profile areas of a project, such as reception counters, boardrooms, and executive areas.
- B. Custom Grade: The aesthetic grade defining a high degree of control over materials, workmanship, and installation. Adequately covers most high-quality architectural woodwork.
- C. Economy Grade: The aesthetic grade defining the minimum degree of control over materials, workmanship, and installation. Typically reserved for woodwork not in public view, such as in mechanical rooms and utility areas.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
 - 2. Provide the information required by AWI/AWMAC/WI (AWS).
 - 3. Include certification program label.
- C. Product Data:
 - 1. Provide data for hardware accessories.
 - 2. Provide proof of compliance with VOC limits for adhesives.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

- E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.
- F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- G. Sustainable Design Submittal: Documentation for sustainably harvested wood-based components.

1.07 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. If requested by the Architect, the casework manufacturer shall provide references and adequate samples of his work for review and approval as a supplier.
 - 2. Single Source Responsibility: Provide and install this work from single fabricator.

1.08 MOCK-UP

- A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.
- B. See Section 01 40 00 - Quality Requirements for additional requirements.
- C. Locate where directed.
- D. Architect-approved mock-up may remain as part of the Work.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture damage.

1.10 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steve Ward & Associates, Knoxville, TN.
- B. Clancy Custom Woodworking, Knoxville, TN.
- C. Kitchen Sales, Knoxville, TN.
- D. Nolen Products, Knoxville, TN.
- E. Substitutions: See Section 01 25 00 – Substitution Procedures.
- F. Single Source Responsibility: Provide and install this work from single fabricator.

2.02 CABINETS

- A. Quality Standard: Custom Grade, in accordance with ANSI/AWI 0641-2019, unless noted otherwise.
 - 1. Economy Grade:
 - a. Doors: Vertical grain; mismatch allowed.
 - b. Drawer fronts: Run grain vertically or horizontally at manufacturer's option.
 - 2. Custom Grade:
 - a. Doors, drawer fronts, and false fronts: Run wood grain vertically and match each cabinet unit.
 - 3. Premium Grade:
 - a. Doors, drawer fronts, and false fronts: Run wood grain vertically and match each cabinet unit.
 - 1) Provide well-matched faces across multiple cabinets in one elevation.
 - 2) Provide Cathedral grain with crown of grain pointing up, and run in same direction for entire project.

B. Plastic Laminate Faced Cabinets: Custom grade.

C. Cabinets:

1. Finish - Exposed Exterior Surfaces:
 - a. Horizontal Surfaces Other Than tops: HGL
 - b. Vertical Surfaces: Grade HGS
 - c. Edges: PVC Edge Banding, 0.12 inch (3mm) thick matching laminate in color, pattern and finish.
2. Finish - Exposed Interior Surfaces:
 - a. Horizontal Surfaces Other Than tops: HGL
 - b. Vertical Surfaces: Grade HGS
 - c. Edges: PVC Edge Banding, 0.12 inch (3mm) thick matching laminate in color, pattern and finish.
3. Finish - Semi-Exposed Surfaces:
 - a. Surfaces other than drawer bodies: Thermally Fused Laminate (TFL); melamine.
 - i. Edges of Plastic Laminate Shelves: PVC Edge Banding, 0.12 inch (3mm) thick matching laminate in color, pattern and finish.
 - ii. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of: Thermally Fused Laminate (TFL); melamine.
4. Drawer Sides and Backs: Solid-hardwood lumber.
5. Drawer Bottoms: Hardwood plywood.
6. Finish - Concealed Surfaces: Manufacturer's option.
7. Door and Drawer Front Edge Profiles: PVC Edge Banding, 0.12 inch (3mm) thick matching laminate in color, pattern and finish.
8. Casework Construction Type: Type A – Frameless.
9. Interface Style for Cabinet and Door: Flush overlay.
10. Adjustable Shelf Loading: 50 lbs. per sq. ft.
 - a. Deflection: L/144.

2.03 LAMINATE MATERIALS

A. Manufacturers:

1. Arborite: www.arborite.com.
2. Formica Corporation: www.formica.com.
3. Interior Arts: www.ialaminates.com.
4. Lab Designs: www.labdesignlaminat.com.
5. Laminart: www.laminart.com.
6. Panolam Industries International, Inc; Nevamar: www.panolam.com.
7. Wilsonart LLC: www.wilsonart.com.
8. Substitutions: See Section 01 25 00 – Substitution Procedures.

B. Thermally Fused Laminate (TFL): Melamine resin, NEMA LD 3, Type VGL laminate panels.

1. Manufacturers:
 - a. Arborite: www.arborite.com.
 - b. Formica Corporation: www.formica.com.
 - c. Panolam Industries International, Inc.: www.panolam.com.
 - d. Wilsonart LLC: www.wilsonart.com.
 - e. Substitutions: See Section 01 25 00 – Substitution Procedures.

C. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

D. Provide specific types as indicated.

1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness.
2. Horizontal Surfaces: HGL, 0.039 inch nominal thickness.
3. Vertical Surfaces: VGS, 0.028 inch nominal thickness.
4. Vertical Surfaces: VGL, 0.020 inch nominal thickness.
5. Post-Formed Horizontal Surfaces: HGP, 0.039 inch nominal thickness.
6. Post-Formed Vertical Surfaces: VGP, 0.028 inch nominal thickness.
7. Flame Retardant Surfaces: HGF, 0.048 inch nominal thickness.

8. Cabinet Liner: CLS, 0.020 inch nominal thickness, through color, white color, finish as indicated.
9. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.04 COUNTERTOPS

- A. Countertops, other than plastic laminate, are specified in Section 12 36 00.
- B. Plastic Laminate Countertops: Medium density fiberboard substrate covered with HPDL, conventionally fabricated and PVC-edge banded.

2.05 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
 1. VOC limits:
 - a. Wood glues: 30 g/L.
 - b. Multi-purpose construction adhesives: 70 g/L.
 - c. Contact adhesives: 250 g/L.
 2. Manufacturers:
 - a. Franklin International, Inc; Titebond Original Wood Glue: www.titebond.com.
 - b. Substitutions: See Section 01 25 00 – Substitution Procedures.
- B. Plastic Edge Banding: Extruded PVC, smooth finish; of width to match component thickness.
 1. Basis of Design Manufacturer: REHAU.
 2. Material Thickness: 3mm.
 3. Shape: Flat.
 4. Color: To match adjacent plastic laminate.
 5. Use at all exposed plywood edges.
 6. Use at all exposed shelf edges.
- C. Fasteners: Size and type to suit application.
- D. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- E. Concealed Joint Fasteners: Threaded steel.
- F. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface.

2.06 HARDWARE

- A. Manufacturers:
 1. Knape & Vogt: www.knapeandvogt.com.
 2. Stanley Hardware: www.stanleyhardwarefordoors.com.
 3. Stylmark: www.stylmark.com.
- B. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
- C. Adjustable Shelf Supports:
 1. Base cabinet and wall hung cabinet Adjustable Shelf Supports: K-V #255 ZC recessed standards (2 per side) with #256R shelf supports with rubber cushions (4 per shelf).
- D. Fixed Americans with Disabilities Act (ADA)-Compliant Vanity and Countertop Brackets:
 1. Material: Aluminum
 2. Finish: Clear anodized.
 3. Products:
 - a. Rakks/Rangine Corporation; HER-1818 Surface Mount EH Counter Support Bracket with Rounded Ends: www.rakks.com.
 - b. Substitutions: See Section 01 25 00 – Substitution Procedures.
- E. Drawer and Door Pulls: As shown on finish schedule.

- F. Cabinet Locks: Keyed disc tumbler, keyed alike, master keyed, steel with satin chrome finish.
 - 1. Hinged doors and drawers: National Lock; No. M4-7054.
 - 2. Sliding Panel Doors:
 - a. 13/16 inch (20.6 mm) thick: National Lock; No. M4-0057.
 - b. 1/4 inch (6.4 mm) thick: National Lock; No. M2-0225.
 - 3. Locate locks as indicated on drawings.
- G. Catches: Provide top mounted magnetic catches with opening resistance in compliance with ADA standard.
 - 1. Products:
 - a. Hafele; www.hafele.com.
 - b. Knappe & Vogt; www.knappeandvogt.com.
 - b. Stanley Hardware; www.stanleyhardwarefordoors.com.
 - 2. Base and Wall Cabinet Doors: Top-mounted catch.
 - a. Tall Cabinet Door: Provide two catches at each door.
 - 3. Catch Housing: White.
- H. Drawer Slides:
 - 1. Type: Full extension.
 - 2. Static Load Capacity: Extra Heavy Duty grade.
 - 3. Mounting: Side mounted.
 - 4. Stops: Integral type.
 - 5. Features: Provide self closing/stay closed type.
 - 6. Manufacturers:
 - a. Accuride International, Inc; Heavy-Duty Drawer Slides: www accuride.com.
 - b. Blum: www.blum.com/us/en.
 - c. Knappe & Vogt Manufacturing Company; #1429, full extension: www.knappeandvogt.com.
 - d. Substitutions: See Section 01 25 00 – Substitution Procedures.
- I. Hinges: Frameless European style concealed 170-degree opening, self-closing type, steel with brushed steel finish.
 - 1. Manufacturers:
 - a. Blum; www.blum.com/us/en.
 - b. Grass America Inc; G393: www.grassusa.com.
 - c. Hafele America; www.hafele.com/us/en.
 - d. Hettich America, LP; www.hettich.com/en-us/home.jsp.
 - e. Substitutions: See Section 01 25 00 – Substitution Procedures.

2.07 SHOP TREATMENT OF WOOD MATERIALS

- A. Provide UL (DIR) listed and approved identification on fire retardant treated material.
- B. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

2.08 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
 - 1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
 - 2. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- E. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:

1. Provide center matched panels at each elevation.
2. Provide sequence matching across each elevation.
3. Carry figure of cabinet fronts to toe kicks.

- F. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches on center.
- G. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

- A. Install work in accordance with AWI/AWMAC/WI (AWS) requirements for grade indicated.
- B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- C. Use fixture attachments in concealed locations for wall mounted components.
- D. Use concealed joint fasteners to align and secure adjoining cabinet units.
- E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
- F. Secure cabinets to floor using appropriate angles and anchorages.
- G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
- H. Site glaze glass materials using the Interior Dry method specified in Section 08 80 00.

3.03 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Furnish all labor, materials and equipment, and perform all work to install waterproofing and dampproofing as shown on the drawings and as specified herein.
- B. In general this section shall include the following:
 - 1. Install waterproofing membrane and protection course at all walls below grade prior to backfilling.
 - 2. Install mastic dampproofing on CMU walls behind brick veneer.
 - 3. The Concrete Contractor shall furnish and install moisture barrier under concrete slabs, and waterstops in foundation and floor slabs.
 - 4. The Masonry Contractor shall assist the Concrete Contractor with the installation of waterstops which bridge the intersection of concrete and masonry.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 SUBMITTALS:

- A Submit manufacturer's specifications and installation instructions for waterproofing membrane, waterstops, and protection board.

1.04 PROJECT CONDITIONS:

- A Provide a suitable area for storage of dampproofing materials and equipment. Store asphalt emulsion containers on end on wood or other clean rigid pad, to prevent adherence of foreign material.
- B Any work or materials damaged during the handling and application of asphalt emulsion shall be restored to original condition or replaced at no additional cost to the Owner.

1.05 GUARANTEE:

- A All areas waterproofed are to be guaranteed during the one (1) year guarantee period. Any water leakage covered herein is to be repaired at the contractor's expense.

PART II PRODUCTS

2.01 MATERIALS:

- A Waterproofing of wall areas below grade and decks above finished space shall be Bituthene System 4000 Waterproofing System as manufactured by Grace Construction Products, Mel-Rol® Waterproofing System as manufactured by W. R. Meadows, Inc. or approved equal.

- 1. Membrane shall be Bituthene 4000 Waterproof Membrane or approved equal.
 - a. Thickness 1/16 in. (1.5 mm) nominal ASTM D3767—method A
 - b. Flexibility, 180° bend over 1 in. (25 mm) mandrel at -25°F (-32°C)Unaffected ASTM D1970
 - c. Tensile strength, membrane, die C 325 lbs/in.2 min. ASTM D412 modified1
 - d. Tensile strength, film 5,000 lbs/in.2 min. ASTM D882 modified1
 - e. Elongation, ultimate failure of rubberized asphalt 300% min. ASTM D412 Modified

- | | | |
|----|---|----------------------------|
| f. | Crack cycling at -25°F (-32°C), Unaffected
100 cycles | ASTM C836 |
| g. | Lap adhesion at minimum application
temperature: 5 lbs/in. (880 N/m) | ASTM D1876 modified2 |
| h. | Peel strength: 9 lbs/in. (1576 N/m) | ASTM D903 modified3 |
| i. | Puncture resistance, membrane:
50 lbs (222 N) minimum | ASTM E154 |
| j. | Resistance to hydrostatic head
210 ft (70 m) of water | ASTM D5385 |
| k. | Permeance 0.05 perms maximum
method | ASTM E96, section 12—water |
| l. | Water absorption 0.1% maximum | ASTM D570 |
2. Surface treatment shall be Bituthene Surface Conditioner.
3. All waterproofing on walls below grade shall be protected by Bituthene Protection Board.
- B Mastic dampproofing shall be asphalt emulsion type equal to Karnak 200 fibrated, manufactured by Karnak Chemical Corporation, Air-Shield™ LMP by W.R. Meadows, or Hydrocide 700 semi-mastic manufactured by Sonneborn Building Products, Division Contech, Inc.

PART III EXECUTION

3.01 SURFACE PREPARATION:

- A Surfaces to receive waterproofing shall be clean, dry, and free of voids, loose aggregate scale, and sharp projections.

3.02 INSTALLATION OF WATERPROOFING ON WALLS:

- A Place Z-strips at footings.
- B At deck applications, adhere tape to wall to depth equivalent to the thickness of wearing slab.
- C Install waterproofing sheets as recommended by manufacturer.
- D Tape joints as recommended by manufacturer.
- E Clean and prepare subsurfaces in accordance with waterproofing manufacturers requirements.
- F Cover waterproofing on exterior walls with polystyrene on impaling pins.

3.03 INSTALLATION OF WATERSTOPS:

- A Install in all walls below grade to bridge the gap between the wall and the slabs on grade.
- B All splicing connections shall be made in accordance with manufacturers recommendations.

3.04 INSTALLATION OF DAMPPROOFING:

- A Apply mastic dampproofing to exterior face of exterior masonry wall which are to receive brick veneer, in one full coat over the block.
- B Fill all cracks, crevices, and pores of concrete. Make sure coating is continuous and free from breaks and pinholes.

C Dampen the dry concrete surfaces and keep surface damp ahead of application.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A. Furnish and install thermal insulation at all exterior cavity walls and batt insulation and insulation where noted on the drawings.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
 - 1. Section 04 20 00 - Unit Masonry.
 - 2. Section 05 40 00 - Cold Formed Metal Framing and Sheathing.
 - 3. Section 09 21 16 – Gypsum Board Assemblies.
 - 4. Section 09 51 00 – Acoustical Ceilings.

1.03 SUBMITALS

- A. Submit product data for all insulation products.

1.04 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 II PRODUCTS

2.01 MATERIAL:

- A. Insulation for exterior metal stud walls shall be 6" (R-19) FSK faced fiberglass batt insulation ASTM C665 Type III, Class A with attachment flanges on paper backing. Insulation shall be sized for friction fit between studs.
- B. Batt insulation at roof trusses shall be 9-1/2 inch (R-30) unfaced fiberglass batt insulation ASTM C 665 Type II, Class A.
- C. Batt insulation not covered by gypsum wallboard, or other code-approved substrate, shall be foil-faced, fire-resistant batt insulation complying with ASTM C 665, Type III, Class A, Category 1. Surface burning characteristics: Maximum flame spread: 25; Maximum smoke developed: 50, when tested in accordance with ASTM E 84.
- D. Sound Attenuation insulation shall be 3-1/2 inch thick unfaced fiberglass acoustical insulation complying with ASTM C 665 Type I. Surface burning characteristics: Maximum flame spread: 10; Maximum smoke developed: 10, when tested in accordance with ASTM E 84. Combustion Characteristics: Passes ASTM E 136 test. Fire resistance rating: Passes ASTM E 119 test.
- E. Sound insulation above acoustic tile ceilings shall be 6-1/4" sonobat insulation (Unfaced fiberglass batt insulation ASTM C665 Type I provided in 24" wide rolls for installation above acoustical ceilings)

- F. Perimeter foundation insulation shall be 1-1/2" thick rigid closed-cell board complying with ASTM C-578 Type IV with the following properties:
1. Compressive Strength: 25 psi minimum
 2. Flexural Strength: 50lbs/in² min (ASTM C 203)
 3. Thermal Resistance: 5 year aged R-values of 5.4 and 5.0 min. °F-ft²-h/Btu²/inch at 40°F and 75°F respectively (ASTM C 518).
 4. Water Absorption: max. 0.1% by volume (ASTM C 272).
 5. Water Vapor Permeance: 1.1 perm-inch max.
 6. Dimensional Stability: 2% max. linear change (ASTM D2126).
 7. Flame Spread: 5 (ASTM E 84).
 8. Smoke Developed: 45 to 165 (ASTM E84)
 9. Size: manufacturer's standard lengths and widths.
 10. Approved manufacturers include:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company.
 - c. Owens Corning.
 - d. Pactiv, Building Products Division.
- G. Insulation for furred masonry walls "Z" furring shall be 1-1/2" thick rigid closed-cell board complying with ASTM C-578 Type IV with the following properties:
1. Compressive Strength: 15 psi minimum
 2. Flexural Strength: 40lbs/in² min (ASTM C 203)
 3. Thermal Resistance: 5 year aged R-values of 5.4 and 5.0 min. °F-ft²-h/Btu²/inch at 40°F and 75°F respectively (ASTM C 518).
 4. Water Absorption: max. 1.1% by volume (ASTM C 272).
 5. Water Vapor Permeance: 1.1 perm-inch max.
 6. Dimensional Stability: 2% max. linear change (ASTM D2126).
 7. Flame Spread: 5 (ASTM E 84).
 8. Smoke DevelopedL 45 to 165 (ASTM E84)
 9. Size: Furnished in boards 23-7/8" wide by manufacturer's standard lengths.
 10. Approved manufacturers include:
 - a. DiversiFoam Products.
 - b. Dow Chemical Company.
 - c. Owens Corning.
 - d. Pactiv, Building Products Division.
- H. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

2.02 VAPOR RETARDER:

- A. Polyethylene Vapor Retarder: 4-mil film ASTM D 4397 with vapor transmission rating of 0.2 perms where noted on the drawings.

PART III EXECUTION

3.01 GENERAL:

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.
- B. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

- C. Install insulation that is undamaged, dry, unsoiled, and has not been exposed at any time to ice or snow.
- D. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement.
- E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.02 INSTALLATION OF VAPOR RETARDERS

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Before installing vapor retarder, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
- C. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
- D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.
- E. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

3.03 INSTALLATION OF BATT INSULATION:

- A. Install sound insulation in walls around rooms and above ceilings as shown on the drawings. Whether or not shown in drawings, install sound insulation in walls around, and above ceilings in, ALL restrooms, offices indicated for three or fewer occupants, conference/meeting rooms, mechanical rooms and any room with a computer server, voltage transformer or dimming rack.
- B. Set vapor-retarder faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.
- C. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
- D. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:
 - 1. Use blanket widths and lengths that fill cavities formed by framing members. Where more than one length is required to fill the cavity, provide lengths that will produce a snug fit between studs.
 - 2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. For wood framed construction with faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to produce air tight installation after concealing finish is in place.
 - 4. Stuff glass-fiber loose-fill insulation into miscellaneous voids and cavity spaces not large enough to receive batts. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.

3.04 INSTALLATION OF RIGID INSULATION AT FURRED MASONRY WALLS:

- A. Install wall insulation as follows:

1. Install insulation boards vertically against backup wythe of masonry. Wedge insulation boards tightly between rows of metal furring stripes.
2. Cut insulation by means of saw, knife, or similar sharp tool to fit around obstructions across the cavity such as vents, louvers, pipe, and conduit. Cut insulation to 8" widths and bevel edges to seal tightly at radius corners.
3. Coordinate the installation of insulation with the masonry work. Be sure the dampproofing or waterproofing is in place on face of backup before insulation is installed.

3.05 CLEAN UP:

- A. Remove all debris and unused insulation products from the site.

3.06 PROTECTION:

- A. Protect installed insulation and vapor retarders 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

PART I GENERAL

1.01 SCOPE:

- A. Furnish and install aluminum soffits and accessories as noted on the drawings and as specified herein.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 07 21 00 – Thermal Insulation.

Section 07 62 00 - Sheet Metal Flashing and Trim.

Section 07 92 00 – Joint Sealants.

1.03 SUBMITTALS

- A. Shop Drawings: Submit detailed drawings showing installation and anchorage details, trim and accessories. Show details of weatherproofing, terminations and penetrations of soffit work.
- B. Product Data: Submit manufacturer's product description, including material types and thicknesses, and installation details.
- C. Samples: Submit one 6 inch long by full width sample of each product proposed for use.
- D. Certificates: Submit documents certifying that products proposed for use meet or exceed the requirements specified herein.
- E. Submit copy of manufacturer's warranty.

1.04 QUALITY ASSURANCE

- A. Source Limitations for Soffit: Obtain each type, color, texture, and pattern of soffit, including related accessories, through one source from a single manufacturer.
- B. Mockup: Build mockup to verify selections made under sample submittals and to demonstrate aesthetic effects.
 - 1. Include outside corner on one end of mockup and inside corner on other end. Show full range of effects including penetrations and closures.
- C. Installer's Qualifications: Installer shall have a minimum of 3 years successful experience installing similar products and shall have completed at least 5 projects in the last 3 years of comparable size and complexity that the Architect may view as evidence of skill and workmanship.

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Store materials off ground, under cover. Protect from damage and deterioration.
- B. Handle materials to prevent damage to surfaces, edges and ends of soffits and accessories. Damaged materials shall be rejected and removed from the site.
- C. Materials shall be delivered in manufacturer's unopened boxed with information adhered to packaging stating the product dimensions, type, profile, color, and SKU#.

1.06 WARRANTY:

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace soffit that does not comply with requirements or that fails within specified warranty period. Failures include, but are not limited to, cracking, deforming, uneven weathering, or otherwise deteriorating beyond normal weathering.

1. Warranty Period: Lifetime Limited transferable

1.07 EXTRA MATERIALS:

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish full lengths of soffit and trim in a quantity equal to 2 percent of amount installed.

PART II PRODUCTS

2.01 ALUMINUM SOFFIT:

- A. Formed and coated aluminum soffits complying with AAMA 1402, including Paragraph 2.2.4.2.1, "Standard Commercial Coating."

1. Available Manufacturers:
a. Alcoa Building Products, Inc.
b. Gentek Building Products, Inc.
c. Kaycan Ltd.
d. Norandex Inc./Reynolds Distribution Company.
e. Rollex Corporation.

- B. Pattern, Texture, Thickness, and Color:

1. Pattern: 12-inch exposure in V-grooved, double 6-inch board style.
a. Texture: Smooth.
b. Ventilation: Provide perforated and unperforated soffit as indicated.
c. Minimum Nominal Thickness: **0.024 inch**.
d. Finish: Manufacturer's standard two-coat PVC finish.
e. Colors for Aluminum Soffit: As selected by Architect from manufacturer's full range.

2.02 ALUMINUM ACCESSORIES:

- A. Provide accessories made from same material as adjacent soffit, unless otherwise indicated.

2.03 FLASHING:

- A. Provide aluminum flashing complying with Division 7 Section "Sheet Metal Flashing and Trim" at window and door heads and where indicated.

B. Finish for Aluminum Flashing: **High-performance organic finish, same color as soffits.**

2.04 ELASTOMERIC JOINT SEALANTS:

- A. Multicomponent urethane joint sealant complying with requirements in Division 7 Section "Joint Sealants" for Use NT (nontraffic) and for Uses M, G, A, and, as applicable to joint substrates indicated, O joint substrates

2.05 FASTENERS:

- A. For fastening to wood, use nails of sufficient length to penetrate a minimum of 1 inch into substrate.

1. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch or 3 screw-threads into substrate.
2. For fastening aluminum, use aluminum fasteners. Where fasteners will be exposed to view, use prefinished aluminum fasteners in color to match item being fastened.
3. For fastening vinyl, use aluminum or hot-dip galvanized fasteners. Where fasteners will be exposed to view, use prefinished aluminum fasteners in color to match item being fastened

PART III EXECUTION

3.01 EXAMINATION:

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of soffit. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION:

- A. Clean substrates of projections and substances detrimental to application.

3.03 INSTALLATION:

- A. General: Comply with soffit manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply. Center nails in elongated nailing slots without binding soffit to allow for thermal movement. Overlap joints to shed water away from direction of prevailing wind.
- B. Install aluminum soffit and accessories according to AAMA 1402.
- C. Isolate dissimilar metals by separating with rubber gaskets or elastomeric sealant. Use rubber washers where fasteners made from dissimilar metal penetrate soffit. Isolate dissimilar metals behind soffit by covering with polyethylene film.

3.04 ADJUSTING AND CLEANING:

- A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.
- B. Clean finished surfaces according to soffit manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Furnish and install a fully adhered rubber membrane roofing system as manufactured by Firestone RubberGard or equal by Carlisle Syntec Systems as specified, where shown on the drawings, including insulation, wood grounds, and wood cleats required to secure roofing in place and miscellaneous items as necessary for a complete warranted installation.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.
 - 1. Section 07 60 00 – Sheet Metal Flashing and Trim.
 - 2. Section 07 72 00 – Roof Accessories.
 - 3. Section 07 92 00 – Joint Sealants.

1.03 PERFORMANCE REQUIREMENTS:

- A General: Install sheet membrane roofing and base flashing that are watertight; will not permit the passage of liquid water; and will withstand wind loads, thermally induced movement; and exposure to weather without failure.
- B Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C Fire Rating: Roof Assembly must conform to UL Class A requirements and roof membrane and accessories must be fire rated and bear the FR marking.
- D Windstorm Classification: Roofing system shall comply with Windstorm Classification as noted in Structural drawing notes.

1.04 SUBMITTALS:

- A Shop Drawings: Submit indicating roof size, membrane seaming diagram, location and type of penetrations, perimeter and penetration details, base flashings and membrane termination, roof insulation make-up and layout that have been accepted by an authorized manufacturer's representative.
- B Warranty: Submit two copies of Firestone's 20 year warranty for EPDM elastomeric sheet roofing.
- C Submit manufacturer's installation specifications or instructions.
- D Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install specified roofing system.
- E Manufacturer Certificates: Signed by roofing manufacturer certifying that the roofing system complies with requirements specified. Upon request, submit evidence of meeting requirements.
- F Warranty: Sample copy of standard roofing system manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.

1.05 REFERENCES:

- A American society for Testing and Materials (ASTM).
- B Federal Specifications FSHH-I-1972/1 Class 2.

1.06 SYSTEM DESCRIPTION:

A All Roofing, unless otherwise noted, shall be elastomeric sheet roofing fully adhered over rigid insulation.

1.07 QUALITY ASSURANCE:

A Roofing applicator shall be certified in writing by Manufacturer as a licensed applicator.

B A single installer shall perform the work of this Section and shall have completed projects of similar scope and complexity.

C All membrane roofing shall be provided by the same manufacturer and installed by the same Contractor for single source warranty coverage.

1.08 PREINSTALLATION CONFERENCE:

A Before installing roofing system, conduct conference at Project site to review installation requirements and conditions. Provide a minimum of 72 hours notice to all parties required to be present at meeting.

1. Meet with Owner's representative, Architect, Roofing installer, Roofing system manufacturer's representative, deck installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
4. Review loading limitations of deck during and after roofing.
5. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
6. Review governing regulations and requirements for insurance, certificates, and inspection and testing if applicable.
7. Review temporary protection requirements for roofing system during and after installation.
8. Review roof observation and repair procedures after roofing installation.
9. Document proceeding, including corrective measures or actions required, and furnish copy of record to each participant.

1.09 ENVIRONMENTAL REQUIREMENTS:

A Weather Conditions: Proceed with elastomeric sheet roofing work only when weather conditions comply with manufacturer's recommendations, and will permit materials to be applied and cured in accordance with those recommendations. Do not exceed temperature limitations recommended by roofing manufacturer.

1.10 WARRANTY:

A Manufacturer's Warranty: Submit executed copy of roofing manufacturer's 20 year warranty executed on the signed by an authorized representative of elastomeric sheet roofing system manufacturer,

PART II PRODUCTS

2.01 MATERIALS:

A General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B Base layer: Polyisocyanurate Board Insulation: ASTM C 1289, Type II, glass-fiber mat facer on both major surfaces.

1. Insulation available from the following manufacturers may be used if approved by the manufacturer of the roofing membrane proposed:
 - a. AlliedSignal Inc.; Commercial Roofing Systems.
 - b. Apache Products Company.
 - c. Atlas Roofing Corporation.
 - d. Carlisle SynTec Incorporated.
 - e. Celotex Corporation.
 - f. Firestone Building Products Company.
 - g. GAF Materials Corporation.
 - h. GenFlex Roofing Systems.
 - i. Hunter Panels, LLC.
 - j. Johns Manville International, Inc.
 - k. Koppers Industries.
 - l. RMAX.
 2. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope indicated on drawings.
 3. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
 4. Minimum Total insulation R-Value: As indicated on drawings. If not indicated on drawings, provide minimum R-30.
- C Insulation Overlay Board- ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/4 inch thick factory primed. Basis of design is DensDeck Prime as manufactured by Georgia-Pacific Corporation. Equal product of other manufacturer is acceptable.
- D Elastomeric Sheet Roofing System Components
1. Manufacturer: Firestone Building Products Co., 250 W. 96th St., Indianapolis, IN 46260.
 2. Membrane Material: Firestone RubberGard Ethylene Propylene Diene Monomer (EPDM), 60 mil Membrane FR (Fire Retardant).
 3. Roof Flashing: Firestone EPDM FormFlash Membrane.
 4. Firestone Bonding Adhesive: BA-2004.
 5. Firestone Pourable Sealer: S-10.
 6. Firestone Water-Block: S-20.
 7. Firestone Night Sealant: S-30A.
 8. Firestone Fastener Sealer: S-40.
 9. Firestone QuickSeam Splice Tape: 100% solids cured butyl base.
 10. Firestone QuickSeam Flashing: 5" splice tape/FormFlash laminate.
 11. Firestone QuickSeam Batten Cover: 6" splice tape/EPDM laminate.
 12. Firestone stainless steel clamping ring.
 13. Firestone Batten Strip: 1" x 18 gauge corrosion protected strapping.
 14. Firestone Prefabricated Pipe Flashings: Molded EPDM membrane.
 15. Firestone Fasteners: Corrosion resistant of types, length, and strength required.
 16. Firestone Termination Bar: 1.30" x .10" thick aluminum bar.
 17. Firestone Splice Primer: QuickPrime Plus
 18. Firestone Termination Bar Fasteners.
 19. High density wood fiber crickets shall be 1/2" thick min. by Georgia Pacific or Celotex.
 20. Firestone Walkway Pads: 30 inch by 30 inch .30 inch thick.
 21. Substitutions: Per Section 01 25 00 – Substitution Procedures.
- E Miscellaneous
1. Nailers, Blocking: No. 2 or better, S4S, Douglas Fir-Larch, preservative-treated for rot resistance.

PART III EXECUTION

3.01 DELIVERY, STORAGE AND HANDLING:

- A Deliver roofing materials, insulation and accessories in manufacturer's protective containers with labels intact and legible, and comply with manufacturer's instructions for storage and handling.
- B Handle rolled goods to prevent damage.
- C Store all materials on clean, raised platforms with weather-protective covering.

3.02 INSTALLATION:

- A Verify proper placement of all roof openings, pipes, curbs, sleeves, ducts, vents and drains.
- B Substrate preparation
 - 1. Comply with manufacturer's instructions for preparation of substrate to receive elastomeric sheet roofing. Clean substrate of dust, debris, and other substances detrimental to elastic sheet roofing work.
 - 2. Beginning of installation means acceptance of conditions as satisfactory.
- C Nailers, Blocking
 - 1. Install blocking at the base of roof projections, penetrations and non-roof edge perimeters as detailed.
 - 2. Install treated wood nailers at roof perimeters, at base of roof projections and around specified roof penetration.
 - a. Total nailer height shall match total thickness of insulation being used. Install with 1/8" gap between each length and at changes in direction.
 - b. Firmly fasten nailer to the deck, wall or existing structurally sound and secured nailers at 16" o.c. maximum, batten strips at 12" o.c. maximum, so as to resist a force of 200 lbs. per lineal foot in any direction.
 - c. Taper nailer where applicable to be flush at point of contact with membrane in either the vertical or horizontal applications.
- D Roof Insulation
 - 1. Loosely lay roof insulation with end joints staggered. Joints shall be 1/4" or less in width. Neatly cut and fit insulation around roof penetrations and projections. Install only dry insulation and only as much insulation as can be covered the same day with membrane and completed.
 - 2. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding ¼ inch with insulation.
 - 3. Anchor roof insulation in accordance with system manufacturer's requirements for fastener type, placement and density.
 - 4. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Loosely butt cover boards together and fasten to roof deck according to roofing system manufacturer's written instructions.
- E Installation Instructions - Fully Adhered Roofing

1. Install elastomeric sheet roofing in accordance with manufacturer's current printed instructions.
2. Loosely lay sheet membrane over roof insulation and allow the membrane to relax 30 minutes minimum before bonding, splicing or attaching.
3. After making sure the sheet is in its final position, evenly fold sheet back on itself after it is in its final position so as to expose the underside. Apply bonding adhesives evenly to both the substrate and the membrane. Apply in sequence to allow equal drying time; allow to dry until tacky, not to stick or string by touch of a dry finger. Starting at the fold, slowly roll the coated membrane into the coated substrate evenly, so as to prevent wrinkles. Compress with stiff push broom to assure full contact
4. Repeat application procedure to other half of sheet.
5. Position the Lap Edge of adjoining sheets to be spliced by overlapping membrane 5 inches. Apply QuickSeam Splice Tape to the bottom sheet after cleaning and priming. Immediately roll the splice tape into place to insure full contact.
6. Roll back top sheet, peel the paper backing off the splice tape by pulling against the weight of the bottom sheet at approximately a 45 degree angle to the tape and parallel with the roof surface. Allow the sheet to fall freely onto the exposed splice tape. Broom the entire surface of the splice as the paper is being removed.
7. Roll the splice to assure full contact.
8. Secure membrane at all locations where the membrane terminates or goes through an angle change greater than 2 inches in 12 inches (i.e. Roof edges, curbs, interior walls, etc.), except for round pipe penetrations less than 18 inches in diameter and square penetrations less than 4 inches square.
9. Install reinforced perimeter fastening strip into the Structural Substrate
10. Complete splice between flashing and sheet roofing before bonding the flashing to vertical surface. Flash all penetrations passing through the sheet membrane.
11. Broom flashing immediately after installation to assure full contact with substrate.
12. Install walkway pads in locations indicated. Adhere walkway pads to substrate with seam tape according to the manufacturer's written instructions.

3.03 CLEANING:

- A Remove trash and debris resulting from roofing work at end of each day's work.

3.04 MANUFACTURER'S FIELD SERVICE:

- A Upon completion of the roofing system, an authorized Firestone representative will make an inspection of the installation for final acceptance. Manufacturer's representative will issue a written report of inspection findings to the Architect with a copy to the Roofing Consultant.

- B The Contractor shall provide a minimum of 72 hours advance notice to the Architect and the Roofing Consultant before the Manufacturer's representative's visit.

3.05 PROTECTION AND REPAIR:

- A Protect sheet membrane roofing from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to the Architect and Roof Consultant.

- B Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair sheet flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A. Provide all labor, equipment, and materials to fabricate and install the following items where indicated on the drawings in accordance with this specification.
1. Edge strip and flashing.
 2. Fascia, scuppers, and trim.
 3. Coping cap at parapets.
 4. Expansion joint and area divider covers.
 5. Fascia and edge metal.
 6. Gutters, scuppers and down spouts.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1 General Requirements, apply to the work under this section.
1. Section 04 20 00 - Unit Masonry.
 2. Section 06 10 00 - Rough Carpentry.
 3. Section 07 72 00 - Roof Accessories.
 4. Section 07 92 00 – Joint Sealants.

1.03 REFERENCES:

- A. American Society for Testing and Materials (ASTM)
1. A653 Standard Specification for Steel Sheet, Zinc-Coated (galvanized) or Zinc-Iron Alloy-Coated (galvannealed) by the Hot-Dip Process.
 2. A792 Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process.
 3. B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 4. B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- B. Warnock Hersey International, Inc., Middleton, WI (WH)
- C. Factory Mutual Research Corporation (FMRC)
- D. Underwriters Laboratories (UL)
- E. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
1. Architectural Sheet Metal Manual, current edition.
- F. National Roofing Contractors Association (NRCA)
1. Roofing and Waterproofing Manual, current edition.

1.04 SUBMITTALS:

- A. Product Data
1. Provide manufacturer's specification data sheets for each product.
 2. Metal material characteristics and installation recommendations.

- B. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specified can be approved.
- C. Provide approval letters from metal manufacturer for use of their metal within this particular roofing system type.
- D. Submit two (2) samples, illustrating typical metal edge, coping, gutters, fascia extenders for material and finish.
- E. Provide 6" square sample of specified sheet materials for Architect approval.
- F. Shop Drawings
 - 1. For manufactured and shop fabricated gravel stops, fascia, scuppers, and all other sheet metal fabrications.
 - 2. Shop drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashing, termination's, and installation details.
 - 3. Indicate type, gauge and finish of metal.
- G. Certification
 - 1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.
 - 2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.05 QUALITY ASSURANCE:

- A. Engage an experienced roofing contractor specializing in sheet metal flashing work with a minimum of five (5) years experience.
- B. Successful contractor is required to maintain a full-time supervisor/foreman who is on the job-site at all times during installation of the new roof perimeter flashing. Foreman must have a minimum of five (5) years experience with the installation of similar system to that specified.
- C. Successful contractor must obtain all components of roof system from a single manufacturer including any roll good materials, if required. Any secondary products that are required, which cannot be supplied by the specified manufacturer, must be recommended and approved in writing by the primary manufacturer prior to bidding.
- D. If required, fabricator/installer shall submit work experience and evidence of adequate financial responsibility. The owners representative reserves the right to inspect fabrication facilities in determining qualifications.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.
- B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.07 JOB CONDITIONS:

- A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal edge system.

1.08 DESIGN AND PERFORMANCE CRITERIA:

A. Thermal expansion and contraction:

1. Completed metal edge flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.

1.09 WARRANTIES:

A. Owner shall receive one (1) warranty from manufacturer of roofing materials covering all of the following criteria. Multiple warranties are not acceptable.

1. Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.
2. Changes: Changes or alterations in the edge metal system without prior written consent from the manufacturer shall render the system unacceptable for warranty(ies).
3. Warranty shall commence on date of substantial completion or final payment, whichever is agreed by contract.
4. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work caused by such leaks or the repairs thereof.
5. Installing roofing contractor shall be responsible for the installation of the edge metal system in general accordance with the membrane manufacturer's recommendations.
6. Installing contractor shall certify that the edge metal system has been installed per the manufacturer's printed details and specifications.
7. One manufacturer shall provide a single warranty for all accessory metal for flashings, metal edges and copings, along with the warranty for metal roof areas, membrane roof areas, and any transitions between two different material types.

PART II PRODUCTS

2.01 MATERIALS:

A. Sheet Steel: Prepainted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Exposed base flashing metal material:
 - a. Aluminum-zinc alloy (galvalume) coated steel, ASTM A792, coating designation AZ-50, in thickness of .0217 nom. /24 gauge or .0336 nom. 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
2. Unexposed base flashing metal material:
 - a. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0299 nom. / 22 gauge; 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
3. Minimum gauge of steel or thickness of Aluminum to be specified in accordance with Architectural Sheet Metal Manual, Sheet Metal and Air Conditioning Contractor's National Association, Inc. recommendations.
4. Exposed surfaces for coated panels:

- a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer.

Weathering finish as referred by National Coil Coaters Association (NCCA).

Property Test Method	Fluorocarbon*		
Pencil Hardness	ASTM D-3363	HB-H	
Bend	NCAA II-2		
Cross-Hatch Adhesion	ASTM D-4145	O-T	NCAA II-19
Gloss	ASTM D-3359		
Reverse Impact	no loss of adhesion		
Nominal Thickness	ASTM D-523	25+/-5%	(60° angle)
	ASTM D-2794	no cracking or loss of adhesion	
	ASTM D-1005		
primer	0.2 mils		
topcoat	0.8 mils		
TOTAL	1.0 mils		

*Subject to minimum quantity requirements

- b. Color shall be as specified

- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, .032 inch thickness unless otherwise noted, finished as follows:

1. Mill Finish: One-side
2. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.

2.02 RELATED MATERIALS:

- A. Metal Primer: Zinc chromate type.
- B. Plastic Cement: ASTM D 4586
- C. Sealant: ASTM C 920, elastomeric sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- D. Underlayment: ASTM D2178, No15 asphalt saturated roofing felt.
- E. Slip Sheet: Rosin sized building paper.
- F. Fasteners:
 1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.

2. Fastening shall conform to Factory Mutual 1-45 requirements or as stated on section details, whichever is more stringent.

2.03 METAL COPING:

- A. Finish on coping shall be Kynar 500 in color to match fascia, gutters and downspouts.
- B. A shop fabricated coping system formed from 24 gauge prefinished paintgrip galvanized steel (.050 Prefinished aluminum), (Kynar 500) constructed in accordance with Figure 3-4A SMACNA 5th Edition may be used in lieu of the above referenced manufactured systems. Provide 6" wide cover plates and gutter bars at joints. Submit detailed shop drawings of accessories and connections for review.

2.04 METAL GRAVEL STOP/ FASCIA AND GUTTER SYSTEM:

- A. Fascia on buildings shall be Econosnap® 24 gauge prefinished steel, fascia, as manufactured by Hickman, or approved equal of or Construction Specialties. Fascia system shall include fascia cover, gutter/splice plate, anchor plate, seal strips, anchors, and all accessories. System shall include Drain-thru gravel Stop in conjunction with gutters. Gutter brackets shall be formed from 3/16 inch by 1 inch G-90 galvanized steel. Gutter support brackets and spacers shall be provided at 3 feet on center maximum.
 - B. A shop fabricated Gutter and fascia/gravel stop shall system, fabricated from .032 inch prefinished aluminum. Gutter and gravel stop system conforming to Figure 1-13 A SMACNA 5th edition may be used in lieu of the above referenced manufactured systems. Gutter brackets shall be formed from 3/16 inch by 1 inch prefinished G-90 galvanized steel. Gutter support brackets and spacers shall be provided at 3 feet on center maximum.
 - C. Downspouts shall be a premanufactured downspout system fabricated from .032 inch Aluminum in accordance Figure 1-31 SMACNA 5th edition. Provide downspout hangers of .028 inch Aluminum, fabricated in accordance with accordance Figure 1-35H SMACNA 5th edition. Locate downspout hangers 6 feet apart maximum, no more than 2 feet from the top and bottom of the downspout. Provide a minimum of 2 hangers per downspout.
 1. Basis of Design: Rectangular corrugated aluminum fabricated from 0.032 inch thick material as manufactured by Spectra Metal Sales, Inc., 6104 Boat Rock Blvd. SW, Atlanta, GA
 - a. Provide premanufactured type "A" and "B" elbows as required by project conditions.
 - D. Finish on conductor heads, downspouts, and accessories shall be Kynar 500 . **Color shall be as selected by the Architect from the manufacturer's standard colors.**
 - E. Joints, end caps, and expansion joints in gutters and downspouts shall be made be the "Rivseal" procedure. Apply Gutterseal to the joint and then draw joint tight by blind riveting.
 - F. Provide expansion joints in gutters at 40 feet on center maximum.
 - G. Where downspouts are subject to damage from groundskeeping equipment or vehicular traffic, provide downspout protection covers fabricated from 10 gage prefinished G-90 galvanized steel in accordance with SMACNA Figure 1-32I . Protection covers shall be set 1 foot above grade and shall extend to 3 feet above grade and shall be fastened to wall with 6 minimum ¼ inch diameter sleeve anchors.
- 2.05 THROUGH WALL METAL SCUPPER:
- A. Scuppers shall be a shop fabricated to conform to Figure 1-26 SMACNA 5th edition.
 - B. Downspouts shall be fabricated from 26 gauge steel in accordance with Plate 1-32 B SMACNA 5th Edition.. Provide downspout hangers of 24 gauge G-90 galvanized steel fabricated in accordance with Figure 1-35 H SMACNA 5th edition. Locate downspout hangers 6 feet apart maximum, no more than 2 feet from the top and bottom of the downspout. Provide a minimum of 2 hangers per downspout.

2.06 WATERPROOF UNDERLAYMENT UNDER COPINGS:

- A. Self-Adhering Sheet Underlayment, High Temperature: Minimum of 30- to 40-mil- (0.76- to 1.0-mm-) thick, slip-resisting, polyethylene-film-reinforced top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release paper backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.
1. Thermal Stability: Stable after testing at 240 deg F (116 deg C); ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F (29 deg C); ASTM D 1970.
 3. Acceptable Products:
 - a. Carlisle Coatings & Waterproofing; Dri-Start HR
 - b. Grace, W. R. & Co.; Vycor Ultra
 - c. Henry Company; Perma-Seal PE.
 - d. SafSeal Innovations; SafSeal 6640.
 - e. TC MiraDRI; WIP 300HT.

2.07 THROUGH WALL FLASHING:

- A. Fabric thru-wall flashing shall be Copper Fabric Flashing with 3 oz. per square foot copper sheet asphalt-and pressure- laminated on both sides with a treated glass fabric. Provide Sandell's Copper Fabric Thru-Wall Flashing as manufactured by Hohmann & Barnard Inc. or Multi-Flash 500 as manufactured by York Manufacturing or Copper Fabric as manufactured by Advanced Building Products Inc.
1. Flashing shall be embedded in the mortar joint of CMU backup walls or attached to metal stud walls with metal termination bar.
 2. Joints in Flashing shall be made by lapping a minimum of 4 inches and coating surfaces with Sandell Asphalt Trowel Mastic.
- B. Provide 1/8 in thick by 1 inch type 304 stainless steel termination bar at attachment of through wall flashing to metal stud walls. Attach termination bar to framing at 16 inches on center with self taping screws.
1. Acceptable products:

Type T1 as manufactured by Hohmann& Barnard Inc.
Termination bar as manufactured by Heckmann Building Products
Termination bar as manufactured by Sandell Manufacturing
Termination bar as manufactured by Wire Bond
Equal products of other manufacturers approved prior to bidding.
- C. Sealant for top of termination bar shall be a multicomponent non-sagging urethane sealant complying with ASTM C920 for type M, Grade NS, class 25, Uses A, G, M, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include DAP, Pecora, Sonneborn, and Tremco.
1. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.

2.08 BASE AND COUNTER FLASHING

- A. Base and Counter Flashing associated with roof to wall intersections shall be fabricated in accordance with Figure 4-7A SMACNA 5th ed.

1. Separate pieces of base flashing are installed as each course of shingles is applied. The upper edge of each piece of flashing should extend 2 inches above each course of shingles. The lower edge should be ½ inch above the butts of the singles forming the next course. Flashing must extend up the wall and onto the roof a minimum of 4 inches . Flashing pieces are nailed to the roof sheathing above the top of each shingle course
2. Counter flashing is installed in a reglet left by the mason or cut by the Contractor. Wedges or tension formig shapes are used to hold the counter flashing in place and the reglet is filled with a compatable sealant. The length of each piece of counter flashing will vary with the slope of the roof but no step should be more than 8 inches high. The width will vary but should always be wide enough to cover 4 inches of the base flashing.

PART III EXECUTION

3.01 COORDINATION:

- A. Coordinate the installation of sheet metal work with the work of other trades, e.g. thru-wall flashing and counterflashing with installation of masonry work.

3.02 PROTECTION:

- A. Dissimilar metals shall not be allowed to come in contact with each other. Isolate any dissimailar metals, masonry or concrete, from metals using bituminous paint, tape, or slip sheet. Use gasketed fasteners where required to prevent corrosive actions.

3.03 GENERAL:

- A. Fastening of metal to walls and wood blocking shall comply with SMACNA Architectural Sheet Metal Manual, Factory Mutual I-60 wind uplift specifications and/or manufacturer's recommendations whichever is of the highest standard.
- B. All accessories or other items essential to the completeness of sheet metal installation,whether specifically indicated or not, shall be provided and of the same material as item to which applied.
- C. Allow sufficient clearences for expansion and contraction of linear metal components. Secure metal using fasteners as required by the system. No exposed face fastening shall be accepted.

3.04 INSPECTION:

- A. Verify curbs are solidly set and nailing strips located.
- B. Beginning of installation means acceptance of existing conditions.
- C. Field measure site conditions prior to fabricating work.
- D. Edge metal installation shall not disrupt other trades. Verify that substrate is dry, clean and free of foreign matter.

3.05 MANUFACTURED SHEET METAL SYSTEMS:

- A. Installing Contractor shall be responsible for determining if the edge metal systems are in general conformance with roof manufacturer's recommendations.
- B. Furnish and install manufactured fascia and coping cap systems in strict accordance with manufacturer's printed instructions.
- C. Provide all factory-fabricated accessories including, but not limited to, fascia extenders, miters, scuppers, joint covers, etc.

3.06 COPINGS:

- A. Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.
 - 1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch (600-mm) centers.
 - 2. Anchor interior leg of coping with screw fasteners and washers at 24-inch (600-mm) centers.

3.07 ROOF DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36 inches (900 mm) apart. Provide end closures and seal watertight with sealant. Slope to downspouts at a rate of 1/8 inch per foot..
 - 1. Fasten gutter spacers to front and back of gutter.
 - 2. Loosely lock straps to front gutter bead and anchor to roof deck.
 - 3. Anchor and loosely lock back edge of gutter to continuous eave or apron flashing.
 - 4. Install gutter with expansion joints at locations indicated, but not exceeding, 40 feet apart. Install expansion-joint caps.
 - 5. 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. in between.
 - 2. Provide elbows at base of downspout to direct water away from building.
 - 3. Connect downspouts to underground drainage system indicated.
- D. Splash Pans: Install where downspouts discharge on low-slope roofs. Set in asphalt roofing cement compatible with roofing membrane.

3.08 SOLDERING:

- A. Clean and roughen edges to be soldered. Apply non-corrosive flux precoat to the surfaces to be joined with solder alloy for a distance of 1-1/2" back from edge of metal. Remove flux residue with clean water. Assemble the parts and solder, using regular non-corrosive rosin flux.
- B. Soldering shall be used for sealing only and joints that must withstand mechanical stresses shall be riveted or screwed in addition to soldering.
- C. Solder shall be 50-50 tin lead type.

3.09 SHOP FABRICATED SHEET METAL:

- A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.
- B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.

- C. Hem exposed edges.
- D. Angle bottom edges of exposed vertical surfaces to form drip.
- E. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.
- F. Joints for gravel stop fascia system, coping cap shall be formed with a 3/8" opening between sections. The opening shall be backed by an internal drainage plate formed to the profile of fascia piece.
- G. Install sheet metal to comply with Architectural Sheet Metal manual, Sheet Metal and Air Conditioning Contractor's National Associations, Inc.

3.10 FLASHING MEMBRANE INSTALLATION:

- A. Scupper Through Roof Edge
 - 1. Install scupper box in a one-quarter (1/4) inch bed of mastic. Assure all box seams are soldered and have minimum four (4) inch flange. Make sure all corners are closed and soldered.
 - 2. Prime metal edge at a rate of one-hundred (100) square feet per gallon and allow to dry.
- B. Snap On Fascia Detail
 - 1. Position base plys of the EPDM or Modified Roofing membrane over the roof edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturers's recommendations.
 - 2. Install scupper boxes and miters first.
 - 3. Fascia Cover: Install fascia cover with splice plate under one end by pressing downward firmly until "snap" occurs and cover is engaged along entire length of miter. Field cut where necessary with fine tooth saw. Sealant is to be placed between splice plates on metal edge pieces, one bead, approximately 1" in from fascia cover joint.
- C. Coping Cap Detail
 - 1. Install Miters first.
 - 2. Position base flashing of Modified Roofing membrane over the wall edge covering nailers completely, fastening eight (8) inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturers's recommendations.
 - 3. Install minimum twelve (12) inch wide anchor chair at five (5'-0") feet on center.
 - 4. Install 8" wide splice plate by centering over 12" wide anchor chair. Apply two beads of sealant to either side of the splice plate's center. Approximately 2" in from the coping cap joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until "snap" occurs and hem is engaged on the entire chair.

3.11 FABRIC THRU-WALL FLASHING:

- A. Install thru-wall flashing continuous near base of all exterior walls, just below drip openings in face brick wythe, and elsewhere as shown on the drawings. Flashing shall be laid in a slurry of fresh mortar and topped with a fresh full bed of mortar. Flashing shall start flush with outside face of wall, cross the cavity on mortar bed and extend up on the face of the inner wythe a minimum of 6" and be turned back into concrete block mortar joint or attached to the wall with termination bar and sealant.
- B. **Head and Sill Flashing:**

The flashing shall start flush with the outside of the wall or lintel angle, then carried through or up the wall as indicated. Flashing shall extend 6" beyond each side of the opening and be turned up at the sides forming a pan. All corners shall be folded, not cut.

C. **Other Areas:**

All membrane flashing at other locations shall be installed in accordance with manufacturer's recommendations.

D. **Joining of Material:**

Joint shall be made by lapping a minimum of 4" and coating the contacting surfaces with Mastic recommended by the manufacturer.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A. Furnish all labor, materials and equipment, and perform all work to install peel and stick polyethylene faced rubberized asphalt flashing as shown on the drawings and as specified herein.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 SUBMITTALS:

- A. Submit manufacturer's data, installation instructions, and 6" square samples of specified sheet materials to the Architect for approval.

1.04 PROJECT CONDITIONS:

- A. Store flashing materials in protected location safe from soiling with and water with temperatures maintained above 50° F.
- B. Do not store materials exposed to direct sunlight.

PART II PRODUCTS

2.01 MANUFACTURER:

- A. Provide one of the following product systems by the indicated manufacturer:
 - 1. Vycor Plus self-adhering flashing as manufactured by Grace Construction Products, 62 Whittemore Avenue, Cambridge, MA 02140, 866-333-3726, Fax: 410-431-7281
 - 2. BT020XL self-adhering flashing as manufactured by Protecto Wrap Company, 2255 South Delaware Street, Denver, CO 80223, Phone: 800-759-9727 or 303-777-3001, Fax: 303-777-9273
 - 3. Tyvek® Flashing System as manufactured by DuPont, P.O. Box 80728, Wilmington, Delaware 19880-0728, 800-448-9835

2.02 SURFACE PRIMERS:

- A. Primer or Spray Adhesive must be used on weathered surfaces, masonry, concrete, OSB sheathing and fiberglass matt faced gypsum sheathing. Primer or spray adhesive must be used in applications with temperatures below 45° F.

PART III EXECUTION

3.01 COORDINATION:

- A. Coordinate the installation of sheet metal work with the work of other trades, e.g., thru-wall flashing and counter-flashing and with the installation of windows and doors.

3.02 CONDITIONS:

- A. Surfaces should be clean, dry, free of dirt and other foreign matter.
- B. There should be no solvent-based caulks used in conjunction with peel and stick flashing.

- C. Peel and stick flashing should be applied at a temperature above 45° F (7° C). For applications from 20° F to 45° F (-6° C to 7° C), the material must be stored in a warm area prior to use.
- D. Work shall be installed as detailed and in accordance with the manufacturer's latest printed instructions, unless otherwise approved by the Architect in writing. Requests for permission to use alternate materials, methods, and details shall be submitted to the Architect, in writing, and shall fully describe the proposed alternatives and the reasons for such proposed changes.

3.03 PRIMER APPLICATION:

- A. Apply primer to all surfaces by roller or brush.
- B. Primed surface shall be free of runs, puddles or excessive primer as this could cause blistering. Brush or roll out all primer puddles or drips immediately.
- C. Prime only as much area as can be covered in half a day's work. Re-prime areas not covered in half a day's work with a light coat of Primer.
- D. The opened containers, when not in use, should have the lids replaced so as to lessen the evaporation of the solvents.
- E. Some bubbling in the primer may occur on the surface as it cures. This has no effect on the performance of the product and will smooth out as the membranes are applied.

3.04 SPRAY ADHESIVE APPLICATION:

- A. Shake can before using.
- B. Turn spray tip so arrow points to dot on rim.
- C. Hold can 6 - 8 inches from surface to be sprayed and apply to surface.
- D. After use, invert can, depress spray tip until spray is free of adhesive. Clean spray tips with turpentine.
- E. Clean oversprayed areas with a mix of 25% - 30% water added to isopropyl alcohol.

3.05 INSTALLING FLASHING:

- A. Self-Adhered Flashing must be continuously supported by the substrate and must not span or bridge joints, gaps or voids in excess of 1/4" (6.4 mm). End laps that occur in subsequent lengths must maintain a minimum overlap of 2" (51 mm).
- B. Begin installation at the bottom of openings and work toward the top lapping all joints to excluded moisture penetration.
- C. Move along opening or joint, being careful to put flashing as evenly as possible over the opening and avoiding fishmouths along the edges.
- D. Press flashing firmly into place with heavy hand pressure as soon as possible, to ensure continuous and intimate contact with the substrate.
- E. If wrinkles develop, carefully cut out affected area and replace in the similar procedure outlined above. The repair piece also must be pressed into place with heavy hand pressure as soon as possible to ensure continuous and intimate contact with the substrate.
- F. Rolling the flashing is essential to gain 100% surface contact of the flashing adhesive to the substrate and will minimize trapping air beneath the tape.
- G. Care should be taken not to leave the membrane exposed to direct sunlight for over 120 days.

- H. Do not stretch the flashing membrane. Stretching will adversely affect the adhesion of the product.
- I. Lap building wrap material 4" on top of flashing and seal the building wrap to flashing.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Curbs.
- B. Roof penetrations mounting curbs.

1.02 RELATED REQUIREMENTS

- A. Section 05 31 00 - Steel Decking.
- B. Section 07 62 00 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
- D. Warranty Documentation:
 - 1. Submit manufacturer warranty.
 - 2. Ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.

1.05 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 ROOF CURBS

- A. Manufacturers:
 - 1. AES Industries Inc: www.aescurb.com.
 - 2. The Pate Company: www.patecurbs.com.
 - 3. LMCurbs; Roof Curbs: www.lmcurbs.com.
 - 4. MKT Metal Manufacturing: www.mktduct.com.
 - 5. Roof Products & Systems (RPS): www.rpscurbs.com.
 - 6. Substitutions: 01 25 00 - Substitution Procedures.
- B. Roof Curbs Mounting Assemblies: Factory fabricated hollow sheet metal construction, internally reinforced, and capable of supporting superimposed live and dead loads and designated equipment load with fully mitered and sealed corner joints welded or mechanically fastened, and integral counterflashing with top and edges formed to shed water.
 - 1. Roof Curb Mounting Substrate: Curb substrate consists of standing seam metal roof panel system.
 - 2. Sheet Metal Material:
 - a. Aluminum: 0.080 inch minimum thickness, with 3003 alloy, and H14 temper.
 - 3. Roofing Cants: Provide integral sheet metal roofing cants dimensioned to begin slope at top of roofing system at 1:1 slope; minimum cant height 4 inches.

4. Fabricate curb bottom and mounting flanges for installation directly on metal roof panel system to match slope and configuration of system.
 - a. Extend side flange to next adjacent roof panel seam and comply with seam configurations and seal connection, providing at least 6 inch clearance between curb and metal roof panel flange allowing water to properly flow past curb.
 - b. Where side of curb aligns with metal roof panel flange, attach fasteners on upper slope of flange to curb connection allowing water to flow past below fasteners, and seal connection.
 - c. Maintain at least 12 inch clearance from curb, and lap upper curb flange on underside of down sloping metal roof panel, and seal connection.
 - d. Lap lower curb flange overtop of down sloping metal roof panel and seal connection.
 5. Provide layouts and configurations indicated on drawings.
- C. Curbs Adjacent to Roof Openings: Provide curb on each side of opening, with top of curb horizontal for equipment mounting.
1. Provide preservative treated wood nailers along top of curb.
 2. Insulate inside curbs with 1-1/2 inch thick fiberglass insulation.
- D. Pipe, Duct, or Conduit Mounting Curbs: Vertical posts, minimum 8 inches square unless otherwise indicated.

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 MBI Companies of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

- A. Clean installed work to like-new condition.

3.05 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

PART I GENERAL

1.01 SUMMARY:

- A. Section Includes:
1. Penetrations through fire-resistance-rated floor, wall and roof construction including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.
 2. Construction-gap firestopping at connections of the same or different materials in fire-rated construction.
 3. Construction-gap firestopping occurring within fire-rated wall, floor or floor-ceiling assemblies.
 4. Construction-gap firestopping occurring at the top of fire-rated walls.
 5. Through-penetration smoke-stopping in smoke partitions.
 6. Construction-gap smoke-stopping in smoke partitions.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
 Section 03 30 00 Concrete Work
 Section 04 20 00 Unit Masonry
 Section 07 92 00 Sealants and Caulking
 Division 26 sections specifying cable and conduit penetrations.

1.03 SYSTEM PERFORMANCE REQUIREMENTS:

- A. General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.
- B. Underwriters Laboratories
1. U. L. Fire Resistance Directory
 - a. Through-Penetration firestop devices (XHCR)
 - b. Fire resistance ratings (BXUV)
 - c. Through-penetration firestop systems (XHEZ)
 - d. Fill, void, or cavity material (XHHW)
 2. U. L. 1479 Test Method for fire Tests of Through-Penetration Firestops, including optional air leak test.
 3. U. L. Component Listing Test Criteria
 4. Warnock Hersey
- C. American Society For Testing And Materials Standards:
1. ASTM.E 814-88: Standard Test Method For Fire Tests of Through-Penetration Firestops.
 2. ASTM 1399

D. CIE/DIN Age Testing

1.04 DEFINITIONS:

- A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.
- B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.
- C. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire, gases and smoke.
- D. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.

- E. Construction Gaps: Gaps between adjacent sections of walls, exterior walls, at wall tops between top of wall and ceiling, and structural floors or roof decks; and gaps between adjacent sections of structural floors.
- F. System: Specific products and applications, classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.
- G. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.
- H. F-Rated: Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.
- I. T-Rated: Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E 814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas.

1.05 DESIGN REQUIREMENTS:

- A. Maintain barrier and structural floor fire resistance ratings (F rating) including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations to permit building movement and sound or vibration absorption and at other construction gaps.

1.06 SUBMITTALS:

- A. Submit in accordance with Section 01 33 00, unless otherwise indicated.
- B. Product data: Manufacturer's specifications and technical data including the following:
 1. Detailed specifications of construction and fabrication.
 2. Manufacturer's installation instructions.
- C. Shop drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.
 1. Details of each proposed assembly identifying intended products and applicable UL System number, or UL classified devices.
 2. Manufacturer or manufacturer's representative shall provide qualified engineering judgments and drawings relating to non-standard applications as needed.
- D. Applicators' qualifications statement providing evidence of compliance with all Installer's Qualifications specified herein.

1.07 QUALITY ASSURANCE:

- A. Installer's Qualifications: Firm specializing in installation or application of systems similar in complexity to those required for this project, plus the following:
 1. Acceptable to or licensed by manufacturer, State or local authority where applicable.
 2. At least 5 years experience with systems.
 3. Successfully completed at least 5 comparable scale projects using this system.
- B. Single-Source Responsibility: Obtain through-penetration firestop systems for each kind of penetration, construction and any other firestop condition indicated from a single manufacturer.
- C. Coordinating Work: Coordinate construction of openings and penetrating items to ensure that designated through-penetration firestop systems are installed per specified requirements.

1.08 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver products in original, unopened packaging with legible manufacturer's identification.
- B. Coordinate delivery with scheduled installation date, allow minimum storage at site.
- C. Storage and Protection: Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing when required. Follow manufacturer's instructions.

1.09 PROJECT CONDITIONS:

- A. Verify conditions and substrates before starting work. Unsatisfactory conditions must be corrected before proceeding.
- B. Proceed with installation only after penetrations of the substrate and supports have been installed.
- C. Environmental Requirements:
 - 1. Furnish adequate ventilation if using solvent.
 - 2. Furnished forced air ventilation during installation if required by manufacturer.
 - 3. Keep flammable materials away from sparks or flames.
 - 4. Provide masking and drop clothes to prevent contamination of adjacent surfaces by firestopping materials.
 - 5. Comply with manufacturing recommendations for temperature and humidity conditions before, during and after installation of firestopping.

1.10 GUARANTEE:

- A. Submit copies of written guarantee agreeing to repair or replace joint sealers which fail in joint adhesion, extrusion resistance, migration resistance, or general durability or appear deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. The guarantee period shall be one year from date of substantial completion.

PART II PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. 3M Fire Protection Products, 3M Center 207-1-02, St Paul, MN 55144-1000, (800) 328-1687. (Contact: Bart Russell, Exterior Materials, Inc., Knoxville, TN. Phone: 865-558-6380).
- B. International Protective Coatings Corporation, 725 Carol Ave., Oakhurst, NJ 07755 (800) 334-8796.
- C. The Rectorseal Corporation, 2830 Produce Row, Houston, TX 77023-5822 (713)928-6423.
- D. Tremco Inc. (The Euclid Chemical Co.) 19218 Redwood Road, Cleveland Ohio, 44110

2.02 MATERIALS:

- A. Fill Materials For Through-Penetration Firestop Systems:
 - 1. Endothermic, Latex Compound Sealant: Single-component, endothermic, latex formulation.
3M Products: Fire Dam 150, Fire Dam 150+
Tremco, Inc.: Fyre-Shield
 - 2. Intumescent, Latex Sealant: Single-component, intumescent, latex formulation.
3M Products: CP25 WB+
Tremco, Inc.: Tremstop W.S. (Wrap Strip)
 - 3. Intumescent Putty: Nonhardening, dielectric, water-resistant putty containing no solvents, inorganic fibers, or silicone compounds.
3M Products: Moldable Putty Stix, Moldable Putty Pads
 - 4. Intumescent Wrap Strips: Single component

- 3M Products: FS-195+, Ultra GS 40
 - Tremco, Inc.: Tremstop W.S. (Wrap Strip)
 - 5. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogenous mortar.
 - 3M Products: Fire Barrier Mortar
 - Tremco, Inc.: Tremco, Inc.: Tremstop M
 - 6. Intumescent Composite Sheet: One part composite system of organic/inorganic, fire-resistive elastomeric sheet, 28 gauge steel, steel wire mesh and aluminum foil.
 - 3M Products: CS 195+
 - 7. Silicone Sealant: Moisture-curing, single-component, silicone based, neutral-curing elastomeric sealant.
 - 3M Products: FB 2000, FB 2000+, FB 1000 N/S, FB 1000 S/L
 - Tremco Inc.: Fyre-Sill, Fyre-Sil S. L.
 - 8. Elastomeric Spray: One part, flexible, sprayable, water-based coating.
 - 3M Products: Fire Dam Spray
 - Tremco, Inc.: Tremstop Acrylic Spray.
 - B. Through-Penetration Firestopping of Fire-Rated Construction: Use endothermic sealant, intumescent sealant, intumescent putty, intumescent wrap strips, mortar, intumescent composite sheets, silicone sealant and other necessary products listed in the UL Fire Resistance Directory for the system involved or mortar systems approved by Warnock Hersey.
 - 1. Systems or devices listed in the U. L. Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it confirms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos free. Mortar systems must be Warnock Hersey Approved.
 - 2. Additional requirements: Withstand the passage of cold smoke either as an inherent property of the system, or by the use of separate product included as a part of the U. L. system or device, and designed to perform this function.
 - C. Construction-Gap Firestopping of Fire-Rated Construction: Use endothermic sealant, silicone sealant, elastomeric spray, intumescent sealant and other necessary products listed in the UL Fire Resistance Directory for the following conditions:
 - 1. Construction gaps between edges of floor slabs and exterior wall construction.
 - 2. Construction gaps between tops of partitions and underside of structural systems.
 - 3. Construction gaps between tops of partitions and underside of ceiling or ceiling assembly.
 - 4. Control joints in fire-rated masonry partitions.
 - 5. Expansion joints.
- 2.03 ACCESSORIES:
- A. Provide components for each firestopping system that are needed to install fill materials and to comply with “System Performance Requirements” article in Part 1. Use only components specified by firestopping manufacturer and approved by qualified testing and inspecting agency for designated fire-resistance-rated systems. Accessories include but are not limited to permanent forming/damming/backing materials including the following:
 - 1. Semirefractory fiber (mineral wool) insulation
 - 2. Ceramic fiber
 - 3. Fire-rated formboard
 - 4. Backer Rod
 - 5. Steel Collars
 - 6. Steel Sleeves
 - 7. Temporary forming materials

PART III EXECUTION:

3.01 EXAMINATION:

- A. Verification of conditions: examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
- B. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
- C. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION:

- A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust, or the required fire resistance.

3.03 INSTALLATION:

- A. Install penetration seal materials in accordance with printed instructions of the U.L. Fire Resistance Directory or Mortars per Warnock Hersey approval and in accordance with manufacturer's instruction.
- B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
- C. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.
- D. Protect materials from damage on surfaces subject to traffic.
- E. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable trays, bus duct or other items, close unused portions of opening with firestopping material tested for the application. See U. L. Fire Resistance Directory or Warnock Hersey approvals.
- F. Install smoke stopping as specified for firestopping.
- G. Where rated walls are constructed with horizontally continuous air space, double width masonry, or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.

3.04 FIELD QUALITY CONTROL:

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.
- C. Perform under this section patching and repairing of firestopping caused by cutting or penetration by other trades.

3.05 ADJUSTING AND CLEANING:

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A. Furnish all labor, materials, tools, equipment and services required to install joint sealants for the following locations:
1. Joints in exterior vertical surfaces and non-traffic horizontal surfaces as indicated below:
 - a. Perimeter joints between wall materials and frames of doors and windows.
 - b. Joints between different materials.
 - c. Other joints as indicated on the drawings.
 - d. Openings around pipes projecting through exterior walls.
 2. Joints in exterior horizontal traffic bearing surfaces as indicated below:
 - a. Control and expansion joints in concrete paving.
 3. Interior joints in vertical and vertical surfaces as indicated below:
 - a. Joints between different materials.
 - b. Joints between plumbing fixtures and adjacent materials.
 - c. Joints around pipes projecting through interior walls.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
- B Caulking in connection with ductwork is specified on HVAC drawings.

1.03 SUBMITTALS:

- A Submit manufacturer's product and application data on products specified.
- B Submit color charts on products requiring color selection.
- C Product test reports.

1.04 QUALITY ASSURANCE:

- A Engage an experienced installer who has completed joint sealant applications similar in material, design, and extent to that indicated for the project that have resulted in construction with a record of successful in-service performance.

1.05 ENVIRONMENTAL CONDITIONS:

- A Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 2. When joint substrates are wet.
 3. Where joint widths are less than allowed by joint sealant manufacturer for application indicated.
 4. Until contaminant capable of interfering with their adhesion are removed from joint substrates.

PART II PRODUCTS

2.01 GENERAL:

- A Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under the conditions of service and application as demonstrated by the manufacturer based on testing and field experience.
- B Match colors indicated by reference.

2.02 MATERIALS:

- A Sealant for caulking of control joints in concrete slabs shall be a two-part, Jet-Fuel-Resistant, non-sag, Polyurethane Rubber Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements relative to formulation and with ASTM C 920 for Type, Grade, Class, and Uses indicated.
 - 1. Urethane formulation: Type M, Class 25, Uses T, M, and O as applicable to joint substrates.
 - 2. Grade P for joints in horizontal paved surfaces.
 - 3. Grade NS for vertical and other joints where installation of a Grade P (self-leveling) sealant would result in sealant flowing out of joint.
- B Sealant for all exterior caulking except as noted, and at cabinets shall be a multicomponent non-sagging urethane sealant complying with ASTM C920 for type M, Grade NS, class 25, Uses A, G, M, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include DAP, Pecora, Sonneborn, and Tremco.
 - 1. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.
- C Sealant for exterior caulking in conjunction with exterior insulation and finish system shall be a single component non-sagging, neutral-curing, ultra low-modulus silicone building sealant complying with ASTM C-920 for Type S, Grade NS, class 25, Uses: A, M, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include Dow Corning, Pecora and Tremco.
 - 1. Additional movement capability: 100 percent in extension and 50 percent in compression for a total of 150 percent movement.
- D Sealant for interior use unless otherwise specified shall be a paintable type equal to DAP Acrylic Latex Caulk, Pecora AC-20 Acrylic Latex, or Tremco Acrylic Latex Caulk.
- E Sealant for interior use in conjunction with plumbing fixtures shall be a low-modulus nonacid-curing silicone sealant, type S, Grade NS, Class 25, uses: A, G, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include DAP, Pecora, Sonneborn, and Tremco.
 - 1. Additional Movement Capability: 100 percent movement in extension and 50 percent in compression for a total of 150 percent movement.
- F Primer shall be the type recommended by the sealant manufacturer and shall be supplied by the manufacturer of the sealant used.

- G Backup material and joint fillers shall be non-staining, compatible with sealant and primer used, and of a resilient nature. Raveled strands of non-staining rope fiber or cotton wicking may be used as filler in deep joints but the filler backing up the sealant shall be rod shaped foam neoprene, foam polyethylene, or hollow vinyl extrusions. Filler material impregnated with oil, bitumen, or similar substances shall not be used in any case.
- H Bond breakers shall be polyethylene tape, pressure sensitive masking tape, or equal, as recommended by the sealant manufacturer.
- I Preformed Foam Sealants: Manufacturer's standard preformed, precompressed, impregnated open cell foam sealant manufactured from high density urethane foam impregnated with a nondrying water repellent agent: factory produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop watertight and airtight seal when compressed to the degree specified by the manufacturer, and complying with the following requirements:
1. Permanently mildew-resistant non-migratory, non-staining, and compatible with joint substrates and other joint sealants.
 2. Impregnating Agent: Chemically stabilized acrylic.
 3. Density: Manufacturer's standard.
 4. Backing: None
 5. Product shall be Colorseal as manufactured by Emseal Joint Systems, Westborough, MA. or equal product of Willseal or Tremco Illbruck.

2.03 JOINT SEALANT BACKING:

- A General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B Plastic Foam Joint Fillers: Preformed, compressible, resilient, non-staining, non-waxing, non-extruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance
- C Closed-cell polyethylene foam, non-absorbent to liquid water and gas, non-outgassing in unruptured state.
- D Elastomeric Tubing Joint Fillers: Neoprene, butyl EPDM, or silicone tubing complying with ASTM D 1056, non-absorbent to water and gas, capable of remaining resilient at temperatures down to -26° F (-32° C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- E Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

PART III EXECUTION

3.01 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. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.02 PREPARATION:

- A Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer 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 concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 3. Remove laitance and form release agents from concrete.
 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. 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 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.
- 3.03 INSTALLATION OF JOINT SEALANTS:
- A General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C Install joint filler of type indicated to provide support of sealants during application and at position required to produce the 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 joint fillers.
 2. Do not stretch, twist, puncture, or tear joint fillers.
 3. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
- D Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the time sealant backings are installed.
- E Tooling of Non-sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
- F Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires

acceleration to produce seal, apply heat to sealant in conformation with sealant manufacturer's recommendations.

3.04 CLEANING:

A Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.05 PROTECTION:

A Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they 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 that and installations with repaired areas are indistinguishable from original work.

END OF SECTION

PART I GENERAL

1.01 WORK INCLUDED:

- A Furnish and install all exterior and interior hollow metal doors, steel doorframes and frames for fixed glass windows, and all necessary incidental work in connection therewith.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 07 92 00 - Joint Sealants.
Section 08 71 00 - Door Hardware.
Section 08 80 00 - Glazing.
Section 09 91 00 - Painting.

1.03 SUBMITTALS:

- A Submit schedules and shop drawings of hollow metal doors and frames to the Architect for approval before any work is fabricated.

PART II PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A Doors and frames shall be products as specified, manufactured by Steelcraft Manufacturing Company, Cincinnati, Ohio; or equal products of the following manufacturers:

Mesker Brothers, St. Louis, Mo.
Metal Products, Inc., Corbin, Kentucky
Curries Corporation, Mason City, Iowa

2.02 MATERIALS:

- A Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (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.
- D Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

2.03 FLUSH DOORS:

- A Doors shall be full flush construction 1-3/4" thick, 16 gauge, cold rolled steel. Doors shall be Type B-16. Doors shall be reinforced, stiffened, sound deadened and insulated with impregnated kraft honeycomb core completely filling the inside of the doors and laminated to both inside faces of the panels.
 - 1. All doors shall have mechanical edge seam or be fully welded and ground smooth if joint is in center of door edge.
 - 2. Hinge and lock edge shall have 1/8" in 2" bevel.
 - 3. Top and bottom 14 gauge cold, rolled steel reinforcing channels shall be spot welded within the door.

4. Top edges of exterior doors shall be finished with flush metal closure.
5. Hinge reinforcing shall be 8-gauge steel.
6. Lock reinforcing shall be 16 gauge.
7. Closer reinforcing shall be 12 gauge.
8. Adequate reinforcing shall be provided for other hardware as required.
9. Mortise, drill and tap for hardware, except that doors be drilled and tapped for surface-mounted hardware in the field.

B Glass light openings shall be provided with removable metal moldings secured in place with oval head countersunk screws.

2.04 ENTRY DOORS:

A Doors shall be fully glazed 1-3/4" thick, 14 gauge, cold rolled steel. Doors shall be reinforced, stiffened, sound deadened and insulated with impregnated kraft honeycomb core completely filling the inside of the doors and laminated to both inside faces of the panels.

1. All doors shall have mechanical edge seam or be fully welded and ground smooth if joint is in center of door edge.
2. Hinge and lock edge shall have 1/8" in 2" bevel.
3. Top and bottom 14 gauge cold, rolled steel reinforcing channels shall be spot welded within the door.
4. Top edges of exterior doors shall be finished with flush metal closure.
5. Hinge reinforcing shall be 8-gauge steel.
6. Lock reinforcing shall be 16 gauge.
7. Closer reinforcing shall be 12 gauge.
8. Adequate reinforcing shall be provided for other hardware as required.
9. Mortise, drill and tap for hardware, except that doors be drilled and tapped for surface-mounted hardware in the field.

2.05 FRAMES:

A Frames shall be flush frames with 2" wide faces, formed of 16 gauge steel. Interior frames shall be fabricated from cold rolled steel. Exterior frames shall be fabricated from metallic coated steel sheet. Frames shall be set up and welded and doorframes shall be provided with temporary spreaders at bottom. Mitered corners shall have reinforcements with integral tabs for secure and easy interlocking of jambs to head. Strike jambs shall be supplied with three factory installed rubber bumpers. Mullions at pairs of doors shall be removable type.

1. Frames shall have 8 gauge steel hinge reinforcements and be mortised for hinges specified.
2. Strike reinforcements shall be 16 gauge.
3. Provide metal plaster guards for all mortise cutouts. Reinforcements for surface closers shall be 12 gauge.
4. Adequate reinforcing shall be provided for other hardware as required.
5. Mortise, drill and tap for hardware, except that frames shall be drilled and tapped for surface-mounted hardware in the field.

B Frames shall be furnished with a minimum of six wall anchors and two adjustable base anchors of manufacturer's standard design at masonry walls and a minimum of six wall anchors (2 base) at stud walls. Anchors for labeled frames shall be UL approved type.

C Steelcraft unitized weatherstripping will be acceptable in lieu of weatherstripping specified for exterior doors in Finish Hardware Section herein.

2.06 LOCATION OF HARDWARE:

A Finishing hardware is specified to be furnished in Section 08 71 00 - Door Hardware. Doors and frames shall be prepared for hardware from templates of the hardware to be furnished.

- B Unless otherwise specifically indicated, hardware shall be located as follows:
1. Knob locks, handle sets, and exit bolt locks; 36" from finish floor to centerline of strike.
 2. Deadlocks: 42" from finish floor to centerline of strike.
 3. Door Pulls and Single Push Bars: 42" from finish floor to centerline of grip or to centerline of push bar.
 4. Push Plates: 42" from finish floor to centerline of strike.
 5. Hinges: Top hinge 9-3/4" from head of frame to centerline of hinge; bottom hinge 10-3/8" from finished floor to centerline of hinge; intermediate hinges equally spaced from top and bottom hinges. Locate top and bottom hinges at toilet stall doors 6" from top and bottom of door.

2.07 DOOR CLEARANCE:

- A Doors shall have 1/8" clearance at top, 3/32" clearance at sides, and 5/8" clearance above finished floor at the bottom, unless noted on the drawings to be undercut.

2.08 FINISH:

- A Doors and frames shall be cleaned, bonderized, and finished with one coat of baked-on prime paint.

PART III EXECUTION

3.01 EXAMINATION:

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of standard steel doors and frames.
1. Examine roughing-in for embedded and built-in anchors to verify actual locations of standard steel frame connections before frame installation.
 2. Delete first subparagraph below if not required.
 3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
 4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION:

- A Remove welded-in shipping spreaders installed at factory.
- B Prior to installation and with installation spreaders in place, adjust and securely brace standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
1. 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.
 2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 3. 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.
 4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.

- C Drill and tap doors and frames to receive nontemplated mortised and surface-mounted door hardware.

3.03 INSTALLATION:

- A General: Provide doors and frames of sizes, thicknesses, and designs indicated. Install standard steel doors and frames plumb, rigid, properly aligned, and securely fastened in place with all clearances accurately maintained; comply with Drawings and manufacturer's written instructions.
- B Standard Steel Frames: Install standard steel frames for doors and other openings, of size and profile indicated. Comply with SDI 105.

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. Where frames are fabricated in sections due to 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.
 - b. Install frames with removable glazing stops located on secure side of opening.
 - c. Install door silencers in frames before grouting.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - f. Apply bituminous coating to backs of frames that are filled with mortar, grout, and plaster containing antifreezing agents.
 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
 4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar as specified in Division 4 Section "Unit Masonry Assemblies."
 5. Concrete Walls: Solidly fill space between frames and concrete with grout. Install grout in lifts and take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
 6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 7. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
 8. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb members.
 9. Installation Tolerances: Adjust standard steel 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 Standard Steel Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Standard Steel Doors:
 - a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
 - b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
 - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
 - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).
- D Smoke-Control Doors: Install doors according to NFPA 105.

3.04 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 standard steel doors or frames that are warped, bowed, or otherwise unacceptable.
- B Clean grout and other bonding material off standard steel doors and frames 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 primer.
- D Galvannealed Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A. Provide all labor, materials, equipment, and supervision necessary to furnish and install wood doors as shown on the drawings and specified herein.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
1. Section 08 11 13 - Hollow Metal Doors and Frames.
 2. Section 08 71 00 - Door Hardware.
 3. Section 09 91 00 - Painting.

1.03 SUBMITTALS:

- A. Product Data: Submit door manufacturer's product construction data, and specifications for each type of wood door, including details of core and edge construction, trim detail for lite openings and similar components.
- B. Specific Product Warranty: Submit a copy of door manufacturer's standard door warranty. Door warranty shall provide for reasonable repair or replacement of the door as originally furnished. Manufacturer may, per its discretion, elect to use either its own or third party resources to resolve warranty claims.
- C. Shop Drawings: Submit shop drawings indicating location, size, thickness, and hand of each door; elevation of each kind of door. Provide the following information:
1. Hardware types and locations. Indicate dimensions and locations of mortises and holes for hardware of factory machined doors.
 2. Location of Hardware blocking where specified.
 3. Vision panel or louver cutout size and location
 4. Indicate requirements for veneer matching.
 5. Indicate fire label requirements including fire rating time duration, maximum temperature rise requirements, and smoke label requirements.
 6. Indicate routing of electrical raceways and dimensions and locations of cutouts in wood doors to accept electric hardware devices.
 7. Pre-finish system type and approved color(s).
- D. Samples:
1. Color samples for factory pre-finishing. Manufacturer must submit samples of not less than 3 - 5" x 8" size on specified veneer species. The sample should reasonably represent the color range of the veneer species selected.

1.04 REFERENCE STANDARDS or most recent edition.

- A. Window and Door Manufacturers Association WDMA I.S. 1-A.
- B. WDMA "How to Store, Handle, Finish, Install and Maintain Wood Doors" published by the Window and Door Manufacturers Association
- C. ANSI/HPVA HP-1-2000 - American National Standard for Hardwood and Decorative Plywood
- D. NFPA 80 - Fire Doors and Windows
- E. NFPA 252 - Standard Methods of Fire Tests for Door Assemblies
- F. Underwriters' Laboratories - UL 10C (positive pressure) - Fire Tests of Door Assemblies whichever applies.

- G. ITS (Warnock Hersey) - Certification Listings for Fire Doors
- H. ASTM E90-02 - Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.
- 1.05 QUALITY ASSURANCE:
- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer specializing in manufacturing products specified in Section 1.3 above, with a minimum of five years documented door building experience under the same ownership.
- B. Meet or exceed WDMA I.S.1-A Custom Grade, AWI (latest version) Custom Grade and / or WIC Custom Grade.
- C. Labeled Doors shall be listed and conform to the requirements of:
1. Intertek Testing Services-Warnock Hersey (ITS-WH) or Underwriters Laboratories (UL).
- D. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.
1. Non-fire-rated doors shall comply with AWI requirements for PC-5 construction. P.C.7 doors will not be accepted.
- E. Fire-Rated Wood Doors: Doors 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.
1. 20 minute rated doors shall comply with AWI requirements for DFP-20 construction.
 2. 45, 60, and 90 minute rated doors shall comply with AWI requirements for Fire Rated Mineral Core; DFM-45, -60, -90 construction.
 3. Temperature-Rise Rating: At exit enclosures and where indicated on drawings, provide doors that have a temperature-rise rating of 450 deg F (250 deg C) maximum in 30 minutes of fire exposure.
- 1.06 CONSTRUCTION REQUIREMENTS:
- A. All doors to have core, 2 stiles (one or two piece laminated) and 2 rails (one or two piece laminated). No voids permitted. Except where noted Type I (waterproof) adhesive is to be used.
- B. Non-Fire Rated Wood Doors - All solid core flush wood doors shall meet WDMA Door Grade
1. Heavy Duty
 2. PC - Particle Core. Stiles and rails securely bonded to the core and entire unit abrasively planing prior to application of faces to assure uniform thickness of all components.
- C. Fire Rated Wood Doors: Where fire-resistance classifications are shown or scheduled, provide doors which are like the non-fire rated doors above but comply with the AWI standards for fire rated doors. Doors will meet the requirements of NFPA No. 80 "Standard for Fire Doors and Windows". Fire rated doors shall bear the label of an independent testing agency having approval of the local building authorities.
- 1.07 PROJECT CONDITIONS:
- A. Delivery/Storage/Handling: Store and protect doors in accordance with manufacturer's recommendations and "How to Store, Handel, Finish, Install and Maintain Wood Doors" published by the Window and Door Manufacturers Association (WDMA).
1. Store doors flat and off the floor on a level surface in a dry, well-ventilated building. Do not store on edge. Protect doors from dirt, water and abuse.
 2. Certain wood species are light sensitive. Protect all doors from exposure to light (artificial or natural) after delivery.
 3. Do not subject interior doors to extremes in either heat or humidity. HVAC systems must be operational and balanced, providing a temperature range of 50 to 80 degrees Fahrenheit and 30% to 60% relative humidity.

4. When handling doors, always lift and carry. Do not drag across other doors or surfaces. Handle with clean hands or gloves.
5. Each door will be marked with the opening number.

1.08 GUARANTEE:

- A. A written guarantee from door manufacturer shall be delivered to the Architect upon completion of the work. The doors shall be guaranteed for the life of the original installation in accordance with N.W.M.A. Standard Door Guarantee. Warranty shall include finishing and hanging.

PART II PRODUCTS

2.01 FLUSH WOOD DOORS:

- A. Wood flush doors, except full glass doors and label doors, shall be 5-ply, particle board core, flush doors, DPC-1 by Marshfield Doorsystems Inc. or Novodoor by Algoma. PC-7 doors will not be accepted. Additional alternate manufacturers must be approved by Architect prior to Bidding and provide product equal to or exceeding specified requirements. Doors shall be stained and finished at the factory and delivered to the project in individual protective packaging. Finish shall be a catalyzed liquid finish complying with AWI Section 1500, to meet or exceed System TR-6
 - B. Wood flush label doors shall be mineral core, flush doors, DFM Series by Marshfield Doorsystems Inc., or Weldrok Core by Algoma. Additional alternate manufacturers must be approved by Architect prior to Bidding and provide product equal to or exceeding specified requirements. Doors shall be stained and finished at the factory and delivered to the project in individual protective packaging.
 - C. Veneer:
 1. Species: As indicated on drawings. If not indicated provide White Birch.
 2. Cut: As indicated on drawings. If not indicated provide Rotary Cut.
 3. Face Grade: WDMA - |A|. As described in HPVA tables AWI section 1300 and ANSI/HPVA-1-2000.
 4. Faces shall be assembled with Type I waterproof glue.
 - D. Matching:
 1. Each leaf: Book Match
 2. Leaves of each Pair: Book Match
 3. Set Match all set of pairs separated by less than 12" between frames.
 4. Assembly of spliced veneer on face shall be Running Match.
 5. The number of flitch sheets used, per door, shall not vary by more than two (2) for any two doors in the building separated by less than forty (40) feet and shall never exceed six (6) per door.
 - E. Door louvers, were required on the Architectural or Mechanical plans shall be manufacturer's standard Flat-Slat, louvers in wood species to match door veneer and sized per the Architectural Drawings.
 1. Position high side of louver toward privacy (occupant) side of door.
 - F. Openings for glazed panels shall be cut at the factory and provided with wood beads to support glass. Vision panels in fire rated wood doors shall have wood veneered noncombustible beads to support glass. Doors are to be factory-glazed.
 - G. Door grills shall be Anemostat Inverted V Louvers with double flange #CHDL-2F 20 gauge, prime painted. Size shall be as indicated on the Mechanical Drawings.
 - H. Doors shall meet and bear UL labels as called for in the Door Finish Schedule.
- 2.02 DOOR FABRICATION:
- A. Factory Pre-fit and Bevel Doors 3° bevel or bevel to suit frame sizes indicated, with 1/4" prefit in width, + 0"/- 1/32", tolerances. Prefit top of door 1/8" +1/16"/-0", and undercut as designated by floor condition. For

fire-rated doors comply with NFPA 80 for pre-fitting and undercutting. Pairs to be 1/8" +1/16"/-0" between leaves.

- B. Factory Pre-Machine Doors for Hardware that is not surface applied.
 - 1. Locations and function hole patterns to comply with specified hardware manufacturers template and requirements of NFPA 80 if it applies.
 - 2. Factory pre-drill all hinge screw pilot holes.
 - 3. Comply with door manufacturer's requirements to maintain full warranty.
 - 4. Specific locations for hardware will be coordinated between frame and door manufacturer. Location of hardware will be placed to assure the door warranty is not voided. Manufacture defined light-lock conflicts are to be followed to maintain both Warranty and Fire Label requirements.
 - 5. Specific hardware preps will be per hardware schedule(s) provided unless in conflict with Warranty or Fire Label. Hardware preps to be neatly and cleanly squared as required per hardware templates.
 - 6. Pre machine all metal astragals and metal channels to be supplied when required by the fire label. re fire-ratings will not allow metal-free edge(s).

2.03 FACTORY FINISHING:

- A. Doors to be factory finished to meet or exceed WDMA I.S. 1A TR-6.
 - 1. Stain: As scheduled on drawings. If not scheduled on drawings, color to be selected from Manufacturer's standard selection.

PART III EXECUTION

3.01 INSTALLATION:

- A. Examine installed door frames prior to hanging door: Verify that frames comply with indicated requirements for type, size, location, and swing and have been installed with plumb jambs and level heads.
- B. Reject doors with defects.
- C. Do not proceed with installation until unsatisfactory conditions have been corrected.
- D. Install wood doors to comply with manufacturer's instructions and referenced quality standard
- E. Install fire-rated doors in corresponding fire-rated frames according to the requirements of NFPA 80.
- F. Job-fit Doors: Align and fit doors in frames with uniform clearances and bevels indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
- G. Fitting Clearances for Non-Fire-Rated Doors: Provide 1/8 inch at jambs and heads, 1/16 inch per leaf at meeting stiles for pairs of doors, and 1/8 inch from bottom of door to top of floor finish or covering. Where threshold is shown or is scheduled, provide 1/4 inch clearance from bottom of door to top of threshold. Provide 3/4 inch clearance from bottom of door to top of floor finish or covering at doors noted on Mechanical Drawings to be undercut.
- H. Fitting Clearances for Fire-Rated-Doors: Comply with NFPA 80.

3.02 ADJUSTING, CLEANING AND PROTECTION:

- A. Operation: Rehang or replace doors that do not swing or operate freely. Adjust as necessary to accommodate operating hardware.
- B. Finished Doors: Refinish or replace doors damaged during installation

- C. Protection: Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at the time of Substantial Completion including keeping door protective covering in place until just before Substantial Completion.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Furnish and install ceiling and wall access doors as shown and specified. See drawings for locations and quantities of doors required.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 SUBMITTALS:

- A Submit shop drawings in accordance with Section 01 30 00.

1.04 WARRANTY:

- A Provide Manufacturer's Standard Warranty.

PART II PRODUCTS

2.01 WALL ACCESS DOORS (NON-RATED).

A. Approved Manufacturers:

1. "WB Series"; J.L. Industries (800-554-6077)
2. "Type RDW"; Karp Associates, Inc. (800-888-4212)
3. "Model NW Series"; Nystrom Building Products (800-547-2635)
4. "Style DW"; Milcor, Inc., a subsidiary of Gibraltar Building Products Group (800-528-1411)

B. Performance Criteria:

1. Door Size: Select from manufacturer's standard sizes to suit required opening.
2. Designed for flush installation in wall construction. Construct of metal with concealed continuous hinge, having recessed screwdriver latch, size as indicated.

2.02 WALL ACCESS DOORS (FIRE RATED):

A. Approved Manufacturers:

1. "FDWB Series"; J.L. Industries (800-554-6077)
2. "Type KRP-450 FR"; Karp Associates, Inc. (800-888-4212)
3. "IW Model Series"; Nystrom Building Products (800-547-2635)

B. Performance Criteria:

1. Door Size: Select from manufacturer's standard sizes to suit required opening.
2. Fire Rating: 1hour labeled or as required to match partition into which it is installed.

2.03 CEILING ACCESS DOORS (Non Rated):

A. Approved Manufacturers/Products:

1. "Model KDW"; Karp Associates, Inc.. (800-888-4212)
2. "Style DW"; Milcor, Inc. (800-528-1411)
3. Model WB-DW; Williams Brothers Corporation of America (800-255-5515)
4. "WB Series"; J.L. Industries (800-554-6077)

5. "NW Series"; Nystrom Building Products (800-447-2635)
- B. Performance Criteria:
1. Door Size: Select from manufacturer's standard sizes to suit required opening.
 2. Sheet metal construction with concealed continuous hinge, flush design. Provide each door with self-closing mechanism and standard flush design "self-latching" latch.
- 2.04 CEILING ACCESS DOORS (FIRE RATED):
- A. Approved Manufacturers:
1. "Model KRP-350FR"; Karp Associates, Inc. (800-888-4212)
 2. "Model WB-FRC"; Williams Brothers Corporation of America (800-255-3515)
 3. "FDWB Series"; J.L. Industries (800-554-6077)
 4. "IW Series"; Nystrom Building Products (800-447-2635)
- B. Performance Criteria:
1. Door Size: Select from manufacturer's standard sizes to suit required opening.
 2. Fire Rating: 1 hour labeled or as required to match assembly into which it is installed.
 3. Sheet metal construction with concealed continuous hinge, flush design. Provide each door with self-closing mechanism and standard flush design "self-latching" latch.
- 2.05 FLOOR/CEILING SYSTEM ACCESS DOORS (FIRE RATED):
- A. Approved Manufacturers:
1. "Model 3210"; Milcor, Inc. (800-528-1411)
 2. Approved substitution by J.L. Industries (800-554-6077)
 3. Approved substitution by Nystrom Building Products (800-447-2635)
 4. Approved Substitution by Karp Associates, Inc. (800-888-4212)
- B. Performance Criteria:
1. Size: Select from manufacturer's standard sizes to suit required opening.
 2. Fire Rating: 1 hour labeled or as required to match assembly into which it is installed.
 3. Sheet metal construction with concealed continuous hinge, flush design. Provide each door with self-closing mechanism and standard flush design "self-latching" latch.
 4. Finish: Bonderized galvanized steel.
- 2.06 SPRINKLER SYSTEM ACCESS DOORS (FIRE RATED):
- A. Approved Manufacturers:
1. Milcor, Inc. (800-528-1411)
 2. Karp Associates, Inc. (718-784-2105)
 3. Williams Brothers Corporation of America (309-796-2371)
- B. Performance Criteria:
1. UL B (1-1/2 hr.) rated with automatic closer, UL rated anchors for construction in which door will be installed, and lockset with knob released keyed as directed by Owner.
- 2.07 EXTERIOR SOFFIT ACCESS DOORS:
- A. Approved Manufacturers:

1. "Model DSC-214M"; J.L. Industries (800-888-4212)
 2. "CAD-FL Series", www.milfab.com, (800-465-2736)
 3. "Model PMS"; Nystrom Building Products (516-294-1801)
- B. Options: Provide key operated cylinder lock and door gasket.
- C. Door Size: Select from manufacturer's standard sizes to suit required opening. Provide 24" x 36" opening where passage through access door is required.

PART III EXECUTION

3.01 GENERAL:

- A. Verify rough openings for door and frame are correctly sized and located.
- B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION:

- A. Install units and their accessories in accordance with final Shop Drawings, manufacturer's data, and as herein specified.
- B. Install frame plumb and level in wall and ceiling openings. Position to provide convenient access to concealed work requiring access. Secure rigidly in place.

3.03 ADJUSTMENT:

- A. Check and readjust operating finish hardware items in work just prior to final inspection.
- B. Remove and replace defective work including doors or frames which are warped, bowed, or otherwise damaged.

3.004 TOUCH-UP:

- A. Immediately after erection of work, sand smooth any rusted or damaged areas of prime coat and touch-up of compatible air drying primer.

3.05 PROTECTION:

- A. Protect doors and frames from damage during transportation and at the job site; store at the site under cover on wood blocking or on suitable floors. After installation, protect doors and frames from damage during subsequent construction activities. Damaged work will be rejected and shall be replaced with new work. Factory enameled finished work shall be shipped in cartons or other suitable containers.

3.06 CLEANING:

- A. Upon completion, metal surfaces of doors and frames that are completely factory finished shall be thoroughly cleaned and touched-up as recommended by the door manufacturer.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A. Furnish all labor, material, equipment, and supervision to provide and install aluminum windows.

1.02 GENERAL:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 07 65 26 – Self-Adhering Sheet Flashing.
Section 07 92 00 – Joint Sealants.

1.03 SUBMITTALS:

- A. Product Data for each type of window required, including:

1. Standard construction details and fabrication methods.
2. Profiles and dimensions of individual components.
3. Data on hardware, accessories, and finishes.
4. Recommendations for maintenance and cleaning exterior surfaces.

- B. Shop Drawings for each type of window required showing:

1. Layout and installation details, including anchors.
2. Typical window unit elevations.
3. Full-size details of typical and composite members.
4. Hardware, including operators
5. Glazing Details
6. Accessories

- C. Samples for color selection.

- D. Certification: Provide certification by a recognized independent testing laboratory or agency certifying that each required type and grade of window complies with performance requirements indicated.

1.04 QUALITY ASSURANCE:

- A. Standards: Performance requirements for structural performance, air infiltration, and water penetration for windows are those specified in AAMA 101 for type, grade and performance class of window units required.

- B. Testing: Manufacturer's stock units of each grade of required window shall have been tested by a recognized testing laboratory or agency in accordance with ASTM E 283 for air infiltration, ASTM E 547 for water penetration, and ASTM E 330 for structural performance.

- C. Performance Requirements: Each required window unit shall comply with the following performance requirements.

1. Air Infiltration: Not more than 0.5 cfm per ft. of operable sash joint for an inward test pressure of 1.57 lbf per sq. ft.

2. Water Penetration: At a static pressure of 8.25 pounds per square foot no water penetration as defined in the test method at an inward test pressure of pressure.
 3. Structural Performance: No glass breakage, damage to hardware, permanent deformation that would impair operation of the unit, or residual deflection greater than 0.4 percent of the span at a positive (inward) and negative (outward) test pressure of 75 lbf per sq. ft.
- D. Insulating Glass Certification Program: Provide insulating glass units permanently marked with the appropriate certification label of the either the Insulating Glass Certification Council (IGCC) or the Associated Laboratories, Inc. (ALI). Provide the certification label either on spacers or at least one component pane of each unit.
- E. Single Source Responsibility: Provide windows produced by a single fabricator who is capable of indicating prior successful production of units similar to those required.

1.05 DESIGN CONCEPT:

- A. The drawings indicate window sizes, profiles, and dimensional requirements and are based on the specific types and models indicated. Window units by other manufacturers having equal performance characteristics may be considered, provided deviations from indicated dimensions and profiles are minor and do not change the design concept or intended performance as judged by the Architect. The burden of proof for equality is on the proposer.

1.06 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.

1.07 WARRANTIES:

- A. Windows: Windows furnished shall be certified as fully warranted against any defects in material or workmanship under normal use and service for a period of one (1) year from date of fabrication.
- B. Finish: The pigmented organic finishes on windows and component parts (such as panning, trim, mullions and the like) shall be certified as complying fully with requirements of AAMA 603 for pigmented organic coating and fully warranted against chipping, peeling, cracking and blistering for a period of ten (10) years from date of installation.
- C. Glass: Glass shall be warranted from visual obstruction due to internal moisture for a period of five (5) years on sealed insulated glass units.

PART II PRODUCTS

2.01 MANUFACTURER:

- A. Windows shall be Double hung Series HX45, thermally broken, insulated units as manufactured by EFCO Corporation or Kawneer/Traco and shall conform to Architectural Aluminum Manufacturers Association Specifications for double hung aluminum windows.

1. Substitutions: Per Section 01 25 00 – Substitution Procedures.

2.02 MATERIALS:

- A. Windows shall conform to all ANSI/AAMA 101-85 H-HC-50 requirements and shall pass with the window sashes closed and locked ASTM E 331 water resistance test, ASTM E 330 uniform load structural test, AAMA 1502.7 Condensation Resistance Test, and the AAMA 1503.1 Thermal Transmittance Test.

- B. Window frames and sash members, including fin trim panning system and retainer legs, shall be of 6063-T5 extruded and heat-treated aluminum. Sweep latches shall be of aluminum or stainless steel. All balances shall be heavy duty Block and tackle type. Balances shall be replaceable. Provision shall be made for the use of half screens. Thermal barrier shall be poured-in-place two part polyurethane. Provide an extruded aluminum spring catch at the sill of the lower sash. Depth of frame shall be not less than 3-7/8".
- C. Windows shall be equipped with screens for operating portion. Screen frames shall be extruded aluminum. They shall be easily mounted or removed from inside. Screens shall have 18 x 14 mesh fiberglass in aluminum frames and shall comply fully with AAMA window screen specifications A1.61, 2, 3, 4, 5, 6, and 7.
- D. Panning system shall include all the fasteners and trim sizes necessary for a complete weather tight and secure installation.
- E. All exposed aluminum shall have thermosetting pigmented organic coating meeting AAMA.603 in color selected by the Architect from the manufacturer's standard colors.
- F. Glass shall be 1" insulated glazing.
- G. Weather-stripping material: Silicone-coated woven pile with polypropylene fin center complying with AAMA 701.

2.03 FABRICATION:

- A. General: Provide the manufacturer's standard fabrication of units. Comply with indicated standards. Include a complete system for assembly of components and anchorage of window units. Comply with requirements of referenced standards for moisture content of lumber at time of fabrication and for relative humidity conditions in the installation areas.
- B. Fabricate windows to produce units that are reglazable without dismantling sash framing. Provide openings and mortises precut, where possible, to receive hardware and other items.
- C. Each operable window unit includes sash, frame, stops, sill (including undersill or nosing), exterior casing and moldings, integral mullions and muntins, hardware, and accessories.
- D. Provide weather-stripping at perimeter of each operating sash.
- E. Preglazed Window Units: Except for light sizes in excess of 100 unitted inches, preglaze window units at the shop before delivery, unless preglazing is not available from the fabricator.
- F. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to the project site, to the maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- G. Fabricate window units with an integral concealed low-conductance polyurethane thermal barrier, located between the exterior and the interior of the window, in a manner which eliminates direct metal to metal contact. The thermal break de-bridge spacing must be a minimum of 3/16 inch.

PART III EXECUTION

3.01 INSPECTION:

- A. Inspect openings before beginning installation. Verify that the opening is correct and the sill plate is level. Do not proceed with installation of window units until unsatisfactory conditions have been corrected.
 - 1. Masonry surfaces shall be visibly dry, and free of excess mortar, sand, and other construction debris.

2. Coordinate window installation with wall flashings and other built-in components.

3.02 INSTALLATION:

- A. Comply with manufacturer's instructions and recommendations for installation of window units, hardware, operators, accessories, and other window components.
- B. Set units plumb, level, true to line, flush with outer face of adjacent storefront without warp or rack of frames or sash. Provide proper support and anchor securely in place.
- C. Set sill members in a bed of compound or with joint fillers or gaskets as indicated, to provide weathertight construction.

3.03 ADJUSTING:

- A. Adjust operating sash and hardware to provide a tight fit at contact points and weather-stripping, and to provide smooth operation and a weathertight closure. Lubricate hardware and moving parts.

3.04 CLEANING:

- A. Clean interior and exterior surfaces promptly after installation. Take care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant, dirt, and other substances.
- B. Clean glass of pre-glazed window units promptly after installation. Wash and polish glass on both faces before Substantial Completion. Comply with manufacturer's recommendations for final cleaning and maintenance. Remove nonpermanent labels from glass surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded or damaged during the construction period.

3.05 PROTECTION:

- A. Protect window units from damage or deterioration until time of substantial completion.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Furnish all labor, materials, tools, equipment, and supervision as required to properly and completely equip all doors as shown on the drawings and specified herein.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, supplemental Conditions and Division 1, General Requirements, apply to the work under this section.

1. Section 08 11 13 - Hollow Metal Doors and Frames.
2. Section 08 14 16 - Flush Wood Doors.
3. Division 26 – Electrical.

1.03 QUALITY ASSURANCE:

- A Obtain each type of Hardware (i.e. locks) from a single manufacturer.

- B "Supplier" refers to a recognized architectural hardware supplier, with warehouse facilities, furnishing hardware for not less than 2 years in the project's vicinity. Supplier must be or employ a full time experienced Architectural Hardware Consultant (AHC – Certified by the Door and Hardware Institute) who, at reasonable times during the course of the work, is available for consultation with the Owner, Architect and Contractor about the project's requirements.

1.04 SUBMITTALS:

- A Submit hardware schedule in manner indicated below. Coordinate hardware with doors, frames, and related work to insure proper size, thickness, hand, function and finish of hardware.

- B Final Hardware Schedule: Based on finish hardware, organize a schedule into "hardware sets" containing all items required for each door or opening. Include the following information:

1. Type, style, function, size, finish and manufacturer of each hardware item.
2. Explanation of abbreviations, symbols, codes, etc. contained in schedule.
3. Fastening and other pertinent information.
4. Location of hardware set cross-referenced to drawings.
5. Mounting locations for hardware.
6. Door frame size and material.

- C Submit schedule at earliest possible date since acceptance of hardware schedule must precede fabrication of other work (i.e. hollow metal frames) critical to construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to a coordinated review of hardware schedule.

- D Furnish templates to fabricators of doors, frames, and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of each other's work, to confirm that adequate provisions are made for proper location and installation of hardware.

- E No hardware shall be ordered until hardware schedule has been approved by the Architect.

1.05 PACKING AND MARKING:

- A All hardware shall have the required screws, bolts, and other fasteners necessary for its' installation packed in the same package as the hardware. Each package shall be legibly and adequately labeled to indicate the part of the work for which it is intended.

- B Hardware shall include such adjusting tools and instructions as furnished by the manufacturer as standard practice. Upon completion of the work, the Contractor shall turn over to the Owner or his representative all such tools, instructions and emergency keys.

PART II PRODUCTS

2.01 GENERAL:

- A Coordinate finish hardware work with work of other trades as required.
- B Cooperate with Finish Hardware supplier in scheduling dates for submittals and delivery of templates and finish hardware.

2.02 MATERIALS:

- A Catalog numbers used in the schedule are as follows:

Butts	- Hager Hinge Co.
Locksets and Card Scanners	- Marks Locksets
Closers	- Yale Security
Push, Pull, Kick Plates, Stops, Misc.	- Hager Hinge Co.
Thresholds, Weatherstrip, Drip Caps	- National Guard Products
Magnetic Holders	- Rixson/Firemark
Overhead Stop & Holders	- Glynn Johnson

- B Maintenance Requirements: Furnish a complete set of specialized tools and instructions for maintenance, adjustment, removal and replacement.

2.03 FINISH:

- A Finish to be Satin Chrome, US26D for all items unless otherwise scheduled. Closers to be sprayed Aluminum to match remainder of hardware.
- B Push, pull and kick plates and overhead holders shall be Satin Stainless Steel, US32D.
- C Thresholds and drip caps to have clear anodized finish.

2.04 KEYING:

- A Furnish all cylinders to Owner for keying by Owner.

2.05 BUTTS:

- A Butts, unless scheduled otherwise, shall be BB1279, 4.5" x 4.5" for doors not more than 36" wide and 5" x 4.5" for doors over 36" wide.
- B Provide two (2) pair butts for doors over 7'-2" high.
- C Provide non-removable pins for all out swinging exterior doors.

2.06 DOOR STOPS:

- A Except where overhead door holders are scheduled, provide 236W Series stop for each door leaf. Substitute type 241F Series of the proper height where wall stop cannot be installed.

2.07 DOOR SILENCERS:

- A Silencers for hollow metal door frames shall be GJ-64. Three mutes required for single swinging doors and two for pairs of doors. Omit for exterior openings.

2.08 CLOSERS:

- A Where closers are scheduled, provide types as specified for exterior and interior openings. Size shall be as recommended by the manufacturer.
- B Provide brackets for closers on exterior out swinging doors and for other doors as required.
- C Provide hold-open arms for all exterior doors and where scheduled for other doors.
- D Provide regular arm or parallel arm as required to mount closers in rooms away from public areas.

2.09 LOCKSETS:

- A Provide types as specified with design as specified at all locations. Cylindrical locksets shall be lever handle with free wheeling levers when lockset is in locked mode.

2.10 KICKPLATES:

- A Provide kick plates 8" high, unless noted otherwise, 2" less than nominal door width for single doors and 1" less than nominal door width for pairs of doors. Kick plates shall be 0.050" thick and beveled on all edges.

2.11 SCHEDULE OF DOOR HARDWARE:

Set No. 1A (101A, 105B)

Each to have:

6	Hinges	BB1199	4 ½" x 4 ½"	NRP	US26D (Hager)
1	Mullion	4954		SP28	(Von Duprin)
1	Exit Device	99DT		US26D	(Von Duprin)
1	Exit Device	99NL		US26D	(Von Duprin)
1	Cylinder	As Required		US26D	(Marks)
2	Closers	4111-SCUSH		689	(LCN)
2	Kick Plates	190S	8" x 2" LDW	US32D	(Hager)
1	Threshold	425		ALUM	(NGP)
2	Sweeps	200NA		ALUM	(NGP)
1	Weatherstrip	127NA		ALUM	(NGP)
1	Mullion Seal	5100N		BLK	(NGP)

Set No. 1B (101B)

Each to Have:

6	Hinges	BB1199	4 ½" x 4 ½"	NRP	US26D (Hager)
1	Mullion	4854		SP28	(Von Duprin)
1	Electric Strike	6111-FSE		US32D	(Von Duprin)
1	Exit Device	99DT		US26D	(Von Duprin)
1	Exit Device	99NL		US26D	(Von Duprin)
1	Cylinder	As Required		US26D	(Marks)
1	Automatic Operator	By Others			
1	Closer	4111-SCUSH		689	(LCN)
2	Kick Plates	190S	8" x 2" LDW	US32D	(Hager)
1	Threshold	425		ALUM	(NGP)
2	Sweeps	200NA		ALUM	(NGP)
1	Weatherstrip	127NA		ALUM	(NGP)
1	Mullion Seal	5100N		BLK	(NGP)

Set No. 1C (101D)

Each to have:

6	Hinges	BB1168	4 ½" x 4 ½"	US26D	(Hager)
1	Mullion	4954		SP28	(Von Duprin)

1	Exit Device	99DT		US26D	(Von Duprin)
1	Exit Device	99NL		US26D	(Von Duprin)
1	Cylinder	As Required		US26D	(Marks)
2	Closers	4111-SCUSH		689	(LCN)
2	Kick Plates	190S	8" x 2" LDW	US32D	(Hager)
2	Silencers	307D		Gray	(Hager)

Set No. 1D (101C)

Each to have:

6	Hinges	BB1168	4 ½" x 4 ½"	US26D	(Hager)
1	Mullion	4854		SP28	(Von Duprin)
1	Electric Strike	6111-FSE		US32D	(Von Duprin)
1	Exit Device	99DT		US26D	(Von Duprin)
1	Exit Device	99NL		US26D	(Von Duprin)
1	Cylinder	As Required		US26D	(Marks)
1	Automatic Operator	By Others			
1	Closer	4111-SCUSH		689	(LCN)
2	Kick Plates	190S	8" x 2" LDW	US32D	(Hager)
2	Silencers	307D		Gray	(Hager)

Set No. 1E (102)

Each to have:

3	Hinges	BB1199	4 ½" x 4 ½"	NRP US26D	(Hager)
1	Exit Device	99NL		US26D	(Von Duprin)
1	Cylinder	As Required		US26D	(Marks)
1	Closer	4111-SCUSH		689	(LCN)
1	Kick Plate	190S	8" x 2" LDW	US32D	(Hager)
1	Threshold	425		ALUM	(NGP)
1	Sweep	200NA		ALUM	(NGP)
1	Weatherstrip	127NA		ALUM	(NGP)

Set No. 1F (105A)

Each to have:

<u>6</u>	<u>Hinges</u>	<u>BB1168</u>	<u>4 ½" x 4 ½"</u>	<u>US26D</u>	<u>(Hager)</u>
<u>1</u>	<u>Mullion</u>	<u>4954</u>		<u>SP28</u>	<u>(Von Duprin)</u>
<u>1</u>	<u>Exit Device</u>	<u>99DT</u>		<u>US26D</u>	<u>(Von Duprin)</u>
<u>1</u>	<u>Exit Device</u>	<u>99NL</u>		<u>US26D</u>	<u>(Von Duprin)</u>
<u>1</u>	<u>Cylinder</u>	<u>As Required</u>		<u>US26D</u>	<u>(Marks)</u>
<u>2</u>	<u>Closers</u>	<u>4111-SCUSH</u>		<u>689</u>	<u>(LCN)</u>
<u>2</u>	<u>Kick Plates</u>	<u>190S</u>	<u>8" x 2" LDW</u>	<u>US32D</u>	<u>(Hager)</u>
<u>2</u>	<u>Silencers</u>	<u>307D</u>		<u>Gray</u>	<u>(Hager)</u>
<u>2</u>	<u>Magnetic Holders</u>				

Set No. 2

Each to have:

1.5 pr.	Butts	BB1279			
1	Lever Storeroom	Marks Locksets to match existing			
1	Door Closer	3301BF			
1	Door Stop				

Set No. 3

Each to have:

1.5 pr.	Butts	BB1279			
1	Lever Office	Marks Locksets to match existing			
1	Door Stop				

Set No. 4 – not used

Set No. 5

Each to have:

3 pr.	Butts	BB1279
1	Lever Classroom	Marks Locksets: Grade 1, 195/26D to match existing
1	Card Scanner	Marks Locksets to match existing system
1	Door Closer	3301BF

Set No. 6

Each to have:

3 pr.	Butts	BB1279
1	Lever Privacy	Marks Locksets to match existing
1	Door Stop	

3PART III EXECUTION:

3.01 INSTALLATION:

- A Locations of hardware shall be in accordance with the recommendations of the National Builders Hardware Association for detailed locations.
- B Install hardware in accurate conformity with the manufacturer's templates.
- C Push and Pulls: Pull plates shall be through-bolted with bolt heads concealed behind push plated.
- D Lock trim shall be as listed in schedule, or equivalent of other approved manufacturers. Dummy trim levers and roses shall be identical to those supplies with locksets. All locksets shall be beveled 1/8" in 2".

3.02 ADJUSTMENT AND CLEANING:

- A Check and adjust each operating item to ensure proper functioning of each unit. Replace units which cannot be adjusted to operate properly.
- B Clean adjacent surfaces soiled by hardware installation.
- C Whenever hardware installation is completed more than one month prior to acceptance or occupancy of building or space, during the week prior to acceptance or occupancy, make final check and adjustment of all items. Clean operating items and restore proper function and finish of hardware and doors. Adjust door control devices to compensate for permanent heating and ventilating conditions.
- D During final adjustment of hardware, instruct Owner's personnel in proper adjustment and maintenance procedures for hardware operations and finished.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

- A. Furnish all labor, material, equipment, and supervision to provide and install full energy, powered door operators for swinging doors where indicated on the drawings and in accordance with the specified requirements.

1.02 RELATED DOCUMENTS

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 07 92 00 – Joint Sealants.
Division 26 – Electrical.
Division 28 - Electronic Safety and Security.

1.03 REFERENCES

- A. 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.
- B. American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA).
1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
 2. ANSI/BHMA A156.19 Standards for Power Assist and Low Energy Power Operated Doors.
- C. Underwriters Laboratories (UL).
1. UL Listed R-9469 Fire Door Operator with Automatic Closer.
 2. UL10C – Positive Pressure Fire Tests of Door Assemblies.
 3. UL 325 - Standard for Safety for Door, Drapery, Gate, Louver, and Window Operators and Systems.
 4. UL991 Listed - Tests for Safety-Related Controls Employing Solid-State Device.
 5. UL244A – Solid – State Controls for Appliances.
 6. UL1998 – Software in Programmable Components.
 7. UL1310 – Class 2 Power Units.
- D. American Association of Automatic Door Manufacturers (AAADM).
- E. American Society for Testing and Materials (ASTM).
1. ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
 2. ASTM B209 Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.
- F. American Architectural Manufacturers Association (AAMA).
1. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.

G. National Association of Architectural Metal Manufacturers (NAAMM).

1. Metal Finishes Manual for Architectural Metal Products.

H. International Code Council (ICC).

1. IBC: International Building Code Building Code.

1.04 DEFINITIONS

- A. Double Swing Doors: A pair of doors that swing with the two doors moving in opposite directions with a mullion between them; each door functioning as a single swing door.
- B. Activation Device: Device that, when actuated, sends an electrical signal to the door operator to activate the operation of the door.
- C. Knowing Act: Consciously initiating the opening of a power operated door using acceptable methods including wall mounted switches such as push plates and controlled access devices such as keypads, card readers and key switches.
- D. Safety Device: A device that detects the presence of an object or person within a zone where contact could occur and provides a signal to stop the movement of the door.

1.05 PERFORMANCE REQUIREMENTS

- A. Provide automatic door operators that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.
- B. Automatic door equipment accommodates medium to heavy pedestrian traffic and have the following minimum performance characteristics:
1. Up to 700 pound (317.5 kg) weight of doors, 48 inches (1219 mm) maximum door width per operator.
- C. Operator capable of operating within temperature ranges of -31° F to 160° F (-35° C to 71° C).
- D. Opening Force requirements for Egress Doors: In the event of power failure to the operator, swinging automatic entrance doors shall open with a manual force, not to exceed 30lbf (133N) applied at 1" (25 mm) from the latch edge of the door.
- E. Break Away Device: Swinging automatic entrances shall require no more than 50 lbf (222 N) applied 1" (25 mm) from the latch edge of the door. When the door(s) is opened in the breakout mode, powered operated components excluding spring power shall not operate the doors.
- F. Closing Time:
1. Doors shall be field adjustable to close from 90 degrees to 10 degrees in 2 seconds or longer as applicable per ANSI/BHMA A156.10 standards.
 2. Doors shall be field adjusted to close from 10 degrees to fully closed in not less than 1.5 seconds.

1.06 SUBMITTALS

- A. Product Data: Manufacturer's product sheets including installation details, material descriptions, dimensions of individual components and profiles, fabrication, operational descriptions and finishes.

- B. Shop Drawings: Submit manufacturer's shop drawings, including elevations, sections and details, indicating dimensions, materials, operator, safety sensor control device, anchors, hardware, finish, options and accessories.
 - 1. Indicate required clearances, and location and size of each field connection.
 - 2. Indicate locations and elevations of entrances showing activation and safety devices.
 - 3. Wiring Diagrams: For power, signal, and activation / safety device wiring.
- C. Samples: Submit manufacturer's samples of aluminum finish.
- D. Manufacturers Field Reports: Submit manufacturer's field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA A156.10 after completion of installation.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door opening installation in quantity as required in Division 01. The manual shall include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include spare parts list.
- F. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.07 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 10 years of documented experience in manufacturing of doors and equipment of similar to that indicated for this Project and that have a proven record of successful in-service performance.
 - 1. A manufacturer with company certificate issued by AAADM.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 5 years documented experience installing and maintenance of units 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.
- C. Certified Inspector Qualifications: Certified by AAADM.
- D. Source Limitations for Automatic Operators: Obtain each type of door operator and sensor components specified in this Section from a single source, same manufacturer unless otherwise indicated.
- E. Certifications: Operators shall be certified by the manufacturer to meet performance design criteria in accordance with the following standards.
 - 1. ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.
 - 2. NFPA 101 - Life Safety Code.
 - 3. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.
 - 4. UL Listed R-9469 Fire Door Operator with Automatic Closer.
- F. Emergency Exit door requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

1.08 COORDINATION

- A. Coordinate door operators with doors, frames and related work to ensure proper size, thickness, hand, function and finish. Coordinate hardware for automatic entrances with hardware required for rest of the project.

- B. Electrical System Roughing-in: Coordinate layout and installation of power door operators with connections to power supplies and access control system as applicable.

1.09 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. Automatic Door Operators shall be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.
- C. During the warranty period a factory-trained technician shall perform service and affect repairs. An inspection shall be performed after each adjustment or repair.
- D. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal business hours.
- E. Manufacturer shall have in place a dispatch procedure that shall be available 24 hours a Day, 7 Days a week for emergency call back service.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Basis of Design: ASSA ABLOY Entrance Systems, 1900 Airport Road, Monroe, NC 28110, 877-773-2123 / 704-290-5520, Fax: 704-290-5555, assaabloyentrance.com, specdesk.na.aaes@assaabloy.com.
- B. Manufacturers pre-approved to product products meeting or exceeding the specified requirements are as follows:
 - 1. Horton Automatics
 - 2. Stanley Access Technologies
 - 3. Additional alternate manufacturers must be approved by Architect in writing by Addendum prior to Bidding.

2.02 AUTOMATIC SWING DOOR OPERATOR

- A. Configuration: Operator to control single swinging doors and pairs of swinging doors as indicated on the drawings.
- B. Automatic Operator: Electro-mechanical, non-handed operator, powered by 24 volt, 1/4 hp motor equal to Besam SW200i full energy automatic door operator. Operator shall be adjustable to compensate for different manual push forces as required. Basis of Design:
 - 1. Automatic operator shall be capable of operating and controlling up to a 700 pound (317.5 kg) door, 48 inches (1219 mm) in width.
 - 2. Surface Mounted Operator:
 - a. Operator is contained in 5-1/8" (130.2 mm) deep x 4 5/16" (110 mm) high extruded aluminum housing with a removable cover.
 - b. Surface Mounted Housing: Continuous for full width of door.
 - c. Connecting Hardware: Operators to have a steel arm from the operator, mounted to the top face of the swing door.

- d. UL Listed R-9469 Fire Door Operator with Automatic Closer where indicated in drawings.
 3. Operator can be field adjusted to comply with ANSI/BHMA A156.19 American National Standard for Power Assist and Low Energy Operated Doors. Activation devices may also need to be switched to knowing-act activation devices for compliance with ANSI/BHMA A156.19.
 4. Electrical Characteristics: Maximum power consumption is 300 watts (2.5 amps at 120 VAC), 50/60hz, built-in thermal overload protection.
 5. Battery Convenience Mode: Operator to maintain continuous operation by battery power during power failure. Battery is continuously monitored and provides a warning signal if the battery is not working properly.
 6. Digital Cycle Counter: Battery powered, 7 digit LCD cycle counter with a reset feature to track door usage cycles.
- C. Door Operation:
1. Opening Cycle: The adjustable speed operator mechanically powers the drive shaft and the torque control maintains constant speed throughout the opening cycle regardless of stack pressures or wind speed. Operator shall allow manual door operation with operational forces as indicated to fully open the door applied at 1" (25 mm) from the latch edge of the door.
 - a. Manual push force shall be adjustable from 5 lbf to 30 lbf maximum.
 2. Hold Open: The operator shall stop and hold the door open at the selected door opening angle for an adjustable period of time (1.5 seconds to 30 seconds).
 3. Closing Cycle: Spring close with speed controlled power assist.
 - a. Upon loss of power, dynamic braking will control the door insuring controlled closing.
 - b. Selectable Torque Control: Automatically adjusts torque without changing the closing speed of the operator.
 - i. When the torque control is activated, the closing speed shall remain constant regardless of stack pressures or wind speed.
 - ii. Torque Cancellation: The torque control is deactivated whenever there is a signal received from door mounted sensors.
 - iii. The torque control is disabled during manual use of the door.
 4. Wind Force Dampening: The operator electromechanically counteracts wind forces, slowing down the door movement to safely open or close the door.
 5. Stack Pressure Compensation: Operator shall counteract positive stack pressures, negative stack pressures, and sudden changes of stack pressures. The operator never allows the door to open or close faster than the speed control settings, regardless of pressures.
 6. Obstruction Control: The operator will stop and reverse the door movement.
 7. Electric Lock Management:
 - a. Internal module for electrified locking integration.
 - b. Electric Lock Output: Selectable 12 VDC, maximum 1200 mA / 24 VDC, maximum 600 mA.

- c. Lock monitoring prevents operator(s) from opening door(s) until release of electrified lock.
 - d. Operator pulls door closed before opening, automatically unjamming electric latch hardware.
 - e. Sequenced operation between operators for pairs of doors allowing lock release and astragal coordination.
 8. Lock Retry Circuit: If attempt to fully close the door is unsuccessful, the operator will automatically reverse open 10 degrees and reclose in an attempt to successfully close the door.
 9. Selectable Alarm Reset: The operator can be field set so that after receiving an alarm signal, the operator will not accept any activation impulses and will operate only as a manual door closer until manually reset.
 10. Electronic Controls: Solid state integrated circuit controls the operation and switching of the swing power operator. The electronic control provides low voltage power supply for all means of actuation. The controls include time delay (1 to 30 seconds) for normal cycle.
 11. Control Switch: Automatic door operators shall be equipped with the following type of multi-position function switch:
 - a. 3 position rocker switch mounted on end cap (On-Auto-Hold).
- D. Operator Interface: Safety Sensor Integration for overhead presence safety device and door mounted reactivation safety sensors.

2.03 ACTIVATION DEVICES

- A. General: Provide activation devices in accordance with ANSI/BHMA A156.10 standards, for condition of exposure and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated. Coordinate activation and devices with door operation and door operator mechanisms.
- B. Knowing Act Activation Device:
 1. Push Plate: Hard wired, 6 inch round, stainless steel push plate switches engraved with "Push to Open" with a blue handicap logo.
 2. Secondary activation: Where activation is by a "knowing act" device, provide a secondary activation sensor as required by ANSI/BHMA A156.10.

2.04 SAFETY DEVICES

- A. General: Provide safety devices in accordance with ANSI/BHMA A156.10 standards, for condition of exposure and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated. Coordinate safety devices with door operation and door operator mechanisms.
- B. Safety Devices: Besam I-Adapt Flex Safety Sensor System A102 (Basis of Design), Combination of a Door Mounted Presence Sensors (DMPS) as specified:
 1. Door Mounted Presence Sensor (DMPS): Door mounted infrared presence safety device (mounted at top of each door); adjustable to provide detection field sizes and functions required by ANSI/BHMA A156.10.
 - a. The door mounted presence detector shall be mounted on both the swing (pull) side and the approach (push) side of the door (2 sensors per leaf), providing detection on both sides of the door.
 - b. Unit to provide detection during the travel of the door.

- c. Upon detection the sensor shall provide a signal to stop or reverse the door action.

2.05 ACCESSORIES

- A. Where required by code and/or indicated on drawings, provide guide rails. Guide Rails shall be minimum 30 inches (762 mm) high, and of type and finished to match doors unless otherwise indicated; positioned and projecting from face of door jamb for distance as indicated, but not less than that required by ANSI/BHMA A156.10 for type of door and direction of travel; with filler panel.
1. Configuration and dimensions shall be as indicated on the drawings AND shall meet code requirements. If dimensions are not provided, Architect shall provide desired dimensions after code requirements are provided.
 2. Material and finish shall match door frame.
 3. Mounting: Floor, freestanding.
 4. Filler Panel: If required by code, provide expanded aluminum mesh panel(s) oriented with long dimension of diamonds vertical. Color to match Architect's sample.

2.06 ALUMINUM FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Automatic Operator Enclosure:
1. For mounting on anodized storefront or other anodized aluminum surfaces, provide Clear or Color anodized to match adjacent surface to meet AAMA 611, Clear, AA- M12C22A41/44, Class I, 0.018 mm.
 2. For mounting on Kynar-coated or other painted surfaces including drywall, provide 2-coat Kynar finish to match adjacent color.
 3. For mounting on clad/metal surfaces match metal type and finish.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical source power to verify actual locations of wiring connections.
- C. Proceed only after such discrepancies or conflicts have been resolved.

3.02 INSTALLATION

- A. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.
- B. Operators: Install automatic operators plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.
1. Install surface mounted hardware using concealed fasteners to greatest extent possible.
 2. Set headers, carrier assemblies, tracks, operating brackets and guides level and true to location with anchorage for permanent support.

- C. Door Operators: Connect door operators to electrical power distribution system as indicated on drawings and/or as specified elsewhere. If building has, or is to have, a smoke evacuation system and/or fire detection system, connect door operator to any and all such systems.
- D. Sealants: Comply with requirements specified in division 7 Section "Joint Sealants" to seal between the operator housing and the adjacent wall surface.
- E. Signage: Apply signage on both sides of each door and sidelite as required by ANSI/BHMA A156.10 and manufacturers installation instructions.

3.03 FIELD QUALITY CONTROL

- A. Manufacturers Field Services:
 - 1. Manufacturer's representative shall provide technical assistance and guidance for installation of doors.
 - 2. Before placing doors into operation, AAADM certified technician shall inspect and approve doors for compliance with ANSI/BHMA A156.10. Certified technician shall be approved by manufacturer.

3.04 ADJUSTING

- A. Adjust door operators, controls and hardware for smooth and safe operation and for weather tight closure. Adjust doors in compliance with ANSI/BHMA A156.10.

3.05 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by automatic operator installation.
- B. Clean metal surfaces promptly after installation. Remove excess sealants, compounds, dirt and other substances. Repair damages finish to match original finish.

3.06 DEMONSTRATION

- A. Engage a factory-authorized representative to train Owner's maintenance personnel to adjust, operate, and maintain safe operation of the door.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Furnish all labor, materials and equipment, and perform all work to install glass in doors, in windows in exterior walls, and in fixed-glass hollow metal view windows on the interior.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

- 1. Section 07 92 00 – Joint Sealants.

1.03 QUALITY OF GLASS:

- A Glass shall meet or exceed the requirements of Federal Specifications DD-G-451C and each piece of glass shall bear factory applied label. Tempered glass shall meet the requirements of Federal Specification DD-G-1403B. Glass shall be equal to that manufactured by Vitro Architectural Glass; Libby-Owens-Ford Company; or ASG Industries.

- B Provide insulating glass units permanently marked either on spacers or at least one component lite of units with appropriate certification label of the Insulating Glass Certification Council.

1.04 SUBMITTALS:

- A Product Data: For each glass product and glazing material indicated.

- B Samples: For the following product, in the form of 12-inch- (300-mm-) square Samples for glass.

- 1. Insulating glass for each designation indicated.

- C Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

- D For solar-control low-e-coated glass, provide documentation demonstrating that manufacturer of coated glass is certified by coating manufacturer.

- E Qualification Data: For installers.

1.05 WARRANTY:

- A Submit written warranty signed by manufacturer of insulating glass agreeing to furnish replacements for insulating glass units that suffer failure of seal (as indicated by dust accumulation on inner surfaces, fogging, or accumulation of vision obstructing film on inner surfaces) during normal usage due to causes other than breakage, improper maintenance, or improper cleaning. Replacements shall be furnished F.O.B. point of manufacturer, freight allowed Project site, within the specified warranty period indicated below

- 1. Insulated Glass: Manufacturer's standard, ten year minimum period.
- 2. Float Glass: Manufacturer's standard, five year minimum period.

PART II PRODUCTS

2.01 TYPES OF GLASS:

- A Glass for use in exterior entrance doors and elsewhere as required by Federal and State Safety Glazing Laws shall be tempered safety glass conforming to requirements of Federal Safety Standard 16CFR1201.

- B. Insulated glass in exterior windows shall be Twindow 1" thick insulated glass with 1/2" air space and two 1/4" Lites, interior lite clear, exterior lite clear, as manufactured by Vitro Architectural Glass and shall meet the certification requirements of I.G.C.C. for a Class CBA rating. Glass shall meet the quality criteria of Federal Specification DD-G-451D. Coatings shall be applied under controlled factory conditions of the manufacturer.
1. Low-E Coating or Film: Pyrolytic or sputtered on second or third surface.
 2. Low-E Insulating glass units shall have a Maximum U value of 0.29, a Maximum Shading Coefficient of 0.37 and a Maximum Solar Heat Gain Coefficient of 0.29

~~C. Interior glass shall be 1/4" thick clear uncoated, fully tempered float glass Type I (transparent glass, flat), Class 1 (clear) conforming to requirements of Federal Safety Standard 16CFR1201.~~

~~C. Type M-1, Transparent One-Way Mirror: Mirror quality float glass with pyrolytic (hard coat) type coating located on high light level surface of glass; ASTM C1376.~~

~~1. Thickness: 1/4 inch.~~

~~2. Glass Tint: Grey.~~

~~3. Glass Type: Fully tempered.~~

~~4. Lighting Ratio: Maintain at least 8:1 lighting level ratio between coated side (bright-observed side) and uncoated side (dim-observer side).~~

2.02 GLASS SIZES:

- A Obtain glass sizes at the building or from manufacturer of frames and sashes into which glass is to be set. Responsibility for correct glass size rests with the Contractor.

2.03 GLAZING MATERIAL:

- A Unless factory glazing is provided, elastic glazing compound shall be Pecora Chemical Company Channel Glazing Compound M-251, or equal products of Tremco or DAP. Butyl tape shall be Tremco Polyshim Tape.

2.04 GLAZING ACCESSORIES:

- A Grills (False Muntins) Provide aluminum grills (muntin bars) as manufactured by Allmetal Inc. of 8 mm x 18 mm contour cross section similar to those in configuration shown on the drawings. Grills shall have baked-on organic coating in color to match aluminum clad wood windows for application as grills between the glass.
- B. Unless factory glazing is provided, elastic glazing compound shall be Pecora Chemical Company Channel Glazing Compound M-251, or equal products of Tremco or DAP. Butyl tape shall be Tremco Polyshim Tape.

3PART III EXECUTION

3.01 GLAZING:

- A Bottom of glass shall be set on wood or plastic setting blocks and similar spacers shall be used at vertical edges of glass to maintain proper clearance from metal and wood frames.
- B In hollow metal glass window frames and doors, bed glass in elastic glazing compound to prevent rattling and carefully install removable metal glazing beads. On exterior doors and windows, back-putty glazing bead to insure watertightness.
- C Glazing shall not be done when temperature is below 40° F. Sash and frames shall be dry and free from dust when glazed. Remove all excess glazing compound and stains from sash, frames and glass immediately after glazing.

D Glazing procedures shall conform to recommendations outlined in the Glazing Manual of the Flat Glass Marketing Association. Basic points of good practice shall include: clean cut edges, no nipping or seamed edges, edge openings in a true plane, and resilient setting blocks at quarter points.

3.02 GLASS BREAKAGE:

A Replace all breakage caused in executing the work or by faulty installation. Improperly set glass or glass which does not fully meet the requirements for its grade will not be accepted. At completion of work, glass shall be whole and free from cracks, scratches, and rattles.

3.03 CLEANING:

A Just before final inspection of the building, clean and wash glass and remove all labels.

END OF SECTION

PART I GENERAL

1.01 SUMMARY:

- A Furnish and install corrugated polycarbonate panels as shown on drawings.

1.02 RELATED SECTIONS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 05 12 13 – Architecturally-Exposed Structural Steel Framing.
Section 07 92 00 – Joint Sealants.

1.03 REFERENCES:

- A Material or installation methods shall comply with the following:

1. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials.
2. ANSI Z97.1-American National Standard for Glazing Materials Used in Buildings.
3. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position.
4. ASTM D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load.
5. ASTM D696- Standard Test Method for Coefficient of Linear Thermal Expansion.
6. ASTM D790/ASTM D 790M - Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
7. ASTM D1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
8. ASTM D1044 - Standard Test Method for Resistance of Transparent Plastic to Surface Abrasion.
9. ASTM D1929 - Standard Test Method for Ignition Properties of Plastics.
10. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning and Decomposition of Plastics.
11. ASTM D4065 - Standard Practice for Determining and Reporting Dynamic Mechanical Properties of Plastics.
12. ASTM D5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of A Striker Impacted by A Falling Weight (Gardner Impact).
13. ASTM E424-71 - Standard Test Methods for Solar Energy Transmittance and Reflectance (Terrestrial) of Sheet Materials.
14. QUV 313B - Accelerated Weathering Test of Non-Metallic Materials.

1.04 SYSTEM DESCRIPTION:

- A Performance Requirements: Provide polycarbonate glazing sheets capable of withstanding normal temperature changes, wind loading, and impact loading without failure, including loss or breakage by failure of sealants or gaskets to remain watertight and airtight, deterioration of plastic sheet and glazing materials, or other defects.

1.05 SUBMITTALS:

- A Submit manufacturer's product data and installation instructions, including:

1. Material weight.
2. Wind load capacity.
3. Light transmission.
4. Shading coefficient.
5. Thermal expansion.

6. Methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
- B Shop Drawings: Provide Shop Drawings indicating details of fabrication and installation.
- C Samples: Submit selection and verification Samples, including available product finishes, colors, and thicknesses.
- D Quality Assurance/Control Submittals: Provide report of material test results for compliance of plastic glazing with specified requirements and manufacturer's certificate(s) that product(s) meet or exceed specified requirements.
- 1.06 QUALITY ASSURANCE:
- A Manufacturer's Qualifications: Not less than 10 years experience in actual production of specified products.
- B Installer's Qualifications: Firm experienced in installation of systems similar in complexity to those required for this Project, including specific requirements indicated.
1. Acceptable to or licensed by manufacturer.
 2. Not less than 5 years experience with systems.
 3. Successfully completed not less than 5 comparable scale projects using similar systems.
 4. Warranty documents specified herein.
- C Comply with applicable federal, state, and local building codes.
- 1.07 DELIVERY, STORAGE, AND HANDLING:
- A Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by manufacturer.
1. Store horizontally on flat pallet in dry, clean, and shaded location.
 2. Avoid storage with unsupported overhanging panel ends or edges.
 3. Handle panels with care to avoid scratches, edge damage, and puncturing.
 4. Leave panels in original packaging until time of installation.
- 1.08 WARRANTY:
- A Manufacturer's Standard Warranty: 10 year warranty against defects in materials, including breakage, discoloration, loss of light transmission, and coating delamination.
- B Manufacturer's Hail-Damage Warranty: 5 year warranty against hail damage.
- C Repair defects from faulty materials or workmanship developed during guarantee period, or replace with new materials, at no additional cost to Owner.

PART II PRODUCTS

2.01 MANUFACTURERS:

- A Products which meet this specification shall be provided by:
1. Palram Americas of Kutztown, PA 19530, 800-999-9459, Fax: 610-285-9928

2. OFIC North America of Fredericksburg, VA, 800-777-7663, Fax: 540-898-7000
3. Sheffield Plastics of Sheffield, MA, 800-628-5084, Fax: 413-229-8717

B Substitutions: Per Section 01 25 00 – Substitution Procedures.

2.02 POLYCARBONATE SHEETS:

A Corrugated Polycarbonate Sheets: Provide polycarbonate sheets complying with the following requirements:

1. Material: Polycarbonate sheets, UV resistant, self-extinguishing, with abrasion-resistant hardcoat surface treatment both sides.
2. Acceptable Products: Corrugated Suntuf Corrugated Sheets or equal.
3. Style: Corrugated.
4. Color: Translucent White
5. Percent Light Transmission (ASTM D1003): 30%.

2.03 ACCESSORIES:

A Ridge, Side and Wall Connector flashings available in materials to match panels.

B Vertical and Horizontal Closure Strips:

1. Material: Foam.
2. Profile: Profile and hardness required to maintain watertight seal.
3. Manufacturer: Acceptable to glazing and sealant manufacturers.

C Joint Sealants:

1. Material: Silicone sealant as provided or approved by polycarbonate panel manufacturer.
2. Do not use ammonia releasing or solvent based sealant.

D Fasteners:

1. Material: Corrosion protected steel.
2. Screw Type: Wood screw with manufacturer-approved washer.
3. Size: Comply with manufacturer's recommendations for specific application.

PART III EXECUTION

3.01 EXAMINATION:

A Do not begin installation until substrates have been properly prepared.

B Site Verification of Conditions:

1. Verify that site conditions and frame openings are acceptable for installation of polycarbonate sheets and meet manufacturer's recommendations.
2. Do not proceed with installation of polycarbonate sheets until unacceptable conditions are corrected.

3.02 PREPARATION:

A Protect plastic surfaces from abrasion and damage during handling and installation.

B Surface Preparation:

1. Remove burrs and other projections from glazing channel surfaces.

2. Immediately before glazing, clean glazing channels and framing members with compatible solvent and wipe dry. Do not allow solvent to pool in channels.
3. Remove coatings not permanently bonded to substrates by peeling back factory applied protective masking sufficient distance for edge engagement.
4. Remove lacquer from metal surfaces where elastomeric sealants are to be used.

3.03 INSTALLATION:

A General:

1. Use standard workshop equipment such as circular saws and jigsaws to make cuts to polycarbonate panels.
2. Blow dust from channels immediately after sawing.
3. Drill with hand or power drill using metal working bits.
4. Install panels with label side skyward and rib channels in direction of slope.
5. Comply with manufacturer's recommendations for edge engagement and expansion allowance.
6. Employ sealants and glazing accessories that have been approved by manufacturer of plastic glazing sheet only.
7. Remove protective masking immediately after glazing operations are completed.

B Securing panels:

1. Predrill fastener holes with a 3/16" drill bit to allow for thermal movement.
2. Attach fasteners as directed on drawings or, if not indicated on drawings, at the crown of every other rib in the horizontal direction
3. Do not overtighten fasteners. The neoprene washer should just touch the panel.

C Sealant Glazing: Install sealant per manufacturer's recommendations.

3.04 CLEANING:

A After installation and before Owner acceptance, comply with the following cleaning procedure:

1. Rinse panel surfaces with clean, lukewarm water to remove loose dust particles.
2. Do not use synthetic cloth, abrasive cleaners, scrapers, squeegees, highly alkaline detergents, sharp instruments or dry cleaning with rags or brushes.
3. Using mild detergent (no abrasives or solvents), wash panel with soft sponge or brush soaked in detergent solution.
4. Rinse panel surfaces with clean, lukewarm water and dry with a clean cotton cloth to avoid spotting.

3.05 PROTECTION:

- A Do not walk directly on panels. Protect with board spanning a minimum of three rafters.
- B Protect installed products from damage by subsequent construction activities, until completion of Project.
- C Field repair of damaged product finishes is prohibited. Replace products that have been damaged by subsequent construction activities.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Metal channel ceiling framing.
- D. Acoustic insulation.
- E. Gypsum wallboard.
- F. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 05 40 00 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.
- B. Section 06 10 00 - Rough Carpentry: Wood blocking product and execution requirements.
- C. Section 07 92 00 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- D. Section 09 51 00 – Acoustical Ceilings: Adjacent ceilings and attachment to gyp bd. Bulkhead.

1.03 REFERENCE STANDARDS

- A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.
- C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- D. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.
- E. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014, with Editorial Revision (2015).
- F. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2017.
- G. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2017a.
- H. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.
- I. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2016.
- J. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- K. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.
- L. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.
- M. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

- B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
- C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum five years of documented experience.
- B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
 - 1. See PART 3 for finishing requirements.

2.02 METAL FRAMING MATERIALS

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
 - 2. Marino: www.marinoware.com.
 - 3. Substitutions: 01 25 00 - Substitution Procedures.
- B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
 - 1. Studs: "C" shaped with flat or formed webs with knurled faces.
 - 2. Runners: U shaped, sized to match studs.
 - 3. Ceiling Channels: C-shaped.
 - 4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
 - 5. Resilient Furring Channels: 1/2 inch depth, for attachment to substrate through both legs; both legs expanded metal mesh.
 - a. Products:
 - 1) Same manufacturer as other framing materials.
- C. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
- D. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
 - 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
 - 2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
 - 3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
 - 4. Deflection and Firestop Track:
 - a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
 - b. Products:
 - 1) FireTrak Corporation; Posi Klip.
 - 2) Metal-Lite, Inc; The System.
 - 3) Substitutions: 01 25 00 - Substitution Procedures.
 - 5. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.

2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. Georgia-Pacific Gypsum: www.gpgypsum.com.
 - 2. National Gypsum Company: www.nationalgypsum.com.
 - 3. USG Corporation: www.usg.com.
 - 4. Substitutions: 01 25 00 - Substitution Procedures.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 - 2. Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
 - 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold resistant board is required at all wet areas, including restrooms.
 - 4. Thickness:
 - a. Vertical Surfaces: 1/2 inch.
 - b. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

2.04 ACCESSORIES

- A. Acoustic Insulation: As specified in Section 07 21 00.
- B. Finishing Accessories: ASTM C1047, galvanized steel, rolled zinc, or rigid plastic, unless noted otherwise.
 - 1. Types: As detailed or required for finished appearance.
 - 2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
 - 3. Products:
 - a. Same manufacturer as framing materials.
 - b. Substitutions: 01 25 00 - Substitution Procedures.
- C. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
- D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 - 1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 - 2. Chemical hardening type compound.
- E. High Build Drywall Surfer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
- F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
- G. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
- C. Studs: Space studs at 16 inches on center.
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
- F. Blocking: Install wood blocking for support of:
 1. Framed openings.
 2. Wall mounted cabinets.
 3. Plumbing fixtures.
 4. Toilet partitions.
 5. Toilet accessories.
 6. Wall mounted door hardware.

3.03 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.05 JOINT TREATMENT

- A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.08 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

PART I GENERAL

1.01 SCOPE

- A Furnish all labor, materials, equipment and supervision necessary to provide and install suspended acoustical tile and grid where scheduled on the drawings.

1.02 GENERAL

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 SUBMITTALS

- A Submit shop drawings.
- B Submit samples of tile and sections of suspension system.

PART II PRODUCTS

2.01 MATERIALS

- A Tile shall be as scheduled on the Drawings.
- B Suspension system shall be as scheduled on the Drawings.
1. If Suspension system is not scheduled on the drawings system shall be: Double-webb, direct hung system complying with ASTM C-635 similar and equal to Donn DX system by USG Interiors Inc.
 2. Classification: Intermediate duty.
 3. Metal: Electro-galvanized steel 0.015 inch thick x 1-1/2 inch high x 15/16 inch face.
 4. Color: White
- C Suspension system in Exterior Areas shall be:
1. Donn DXLA double webb, direct hung system complying with ASTM C-635 as manufactured by USG Interiors Inc.
 2. Classification; Intermediate duty.
 3. Metal: Hot dipped galvanized steel 0.015 inch thick x 1-1/2 inch high x 15/16" face with painted aluminum cap.
 4. Color: White.
- D Hanger Wire: Provide not less than 12 gauge galvanized carbon steel ASTM A641, soft temper.
- E Edge Moldings and trim: Manufacturer's standard metal of types and profiles required for all applications encountered. Fabricate to fit all penetrations exactly.
- F Ceiling tile hold down clips shall be similar and equal to Donn Q-1 for use as required at Fire rated assemblies and at entries a shown on the drawings.
- G Plastic grid clips shall be similar and equal to Part # 107015 as manufactured by K International, Inc., 3982 Ryan Rd., Gurnee, IL 60031, 800-323-2389. Provide a minimum of eight (8) for each room designated as an "E" occupancy on the Life Safety drawing. Provide a minimum of four (4) for each room designated as a "B" occupancy on the Life Safety drawing.

PART III EXECUTION

3.01 INSTALLATION

- A Installation shall be by distributor authorized by the manufacturer of the tile in accordance with published recommendations and approved drawings. Provide all edge moldings, clips and related accessories.
- B Cooperate and coordinate installation with electrical and mechanical trades, regarding light fixtures, diffusers, and other equipment.
- C Install systems in compliance with ASTM C636, governing regulations and fire-resistance requirements. Support hangers only from structural members. Locate hangers not less than 6 inches from each end and spaced 4 feet on center along main runner. Level to within 1/8 inch in 12 feet. Limit deflection to 1/360 of span length in inches.
- D Install hangers plumb and free from contact with objects which are not part of structural or ceiling system. Wire connections shall be capable of supporting a 100 pound allowable load.
- E Provide main runners continuous in line with each side of recessed lights. Entire suspension system shall be completely connected forming a homogeneous frame. Independent/unattached fields are prohibited.
- F Provide trim and moldings as required to conceal edges of acoustic tiles.
- G Install panels to fit accurately at borders and penetrations.
- H Suspended ceiling system shall not be used to support ductwork, piping, insulation, etc.

3.02 ADDITIONAL INSTALLATION REQUIREMENTS

- A General: Comply with requirements of authority having jurisdiction in the respective seismic zone.
- B Individual light fixtures or other attachments to the ceiling system, with a combined weight of 56 pounds or less shall have two 12 gauge wire hangers attached, with slack, at diagonal corners of the fixture to prevent drop out.
- C Any fixture or attachment weighing more than 56 pounds must be independently supported from the structure.
- D The minimum connection strength for main and cross runner intersection/splices shall be 60 pounds. In compression and tension (must allow 5 degree offset in any direction).
 - 1. Ceiling system actual weight, including grid, panel, light fixtures and air terminals to be 2.5 pounds per sq. ft. or less. All other services shall be independently supported from the structure.
- E The ceiling system cannot be used to provide lateral support for walls or partitions.
- F Perimeter closure angles must provide a min 7/8 inch support ledge. Terminal ends of grid or tile must rest on ledge with min 3/8 inch clearance from wall:
 - 1. For support ledges smaller than 7/8 inch, terminal ends of cross or main runners shall be independently supported within 8 inches from each wall or ceiling discontinuity. This support must prevent grid from falling. This support should not be out of plumb greater than 1 in 6. Maintain 3/8 inch end clearance from wall.

2. All penetrations (i.e. columns, sprinklers, etc.) and independently supported fixtures are considered perimeter closures that must allow noted clearances.
- G At wall Closure ledges, cross and main runners must be prevented from spreading apart. Permanent attachment for grid alignment purposes is prohibited.
- 3.03 ADJUST AND CLEAN
- A Clean exposed surfaces of panels, moldings, and trim. Remove and replace work which cannot be cleaned to permanently eliminate evidence of damage.
- 3.04 ATTIC STOCK
- A Contractor shall furnish 5% extra ceiling tile for each type used in this project.
- B Extra tile shall be packaged and marked as to type and furnished to the Owner at the completion of the project.
- 3.05 CLEAN-UP
- A Remove all debris after tile work is complete in each space.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Furnish all labor, materials, equipment and supervision necessary to provide and install linear metal ceiling system including suspension system and accessories where scheduled on the drawings.
- B System Description: The system consists of prefinished aluminum panels, carriers, accessories and provisions for the incorporation of mechanical diffusers and lighting fixtures. The system installations are for both interior and exterior applications.
- C Performance Characteristics: Provide manufacturer's standard system which when installed will provide the following minimum requirements:
 - 1. Wind Load Resistance for Exterior Applications: Provide components capable of withstanding both positive and negative design wind uplift pressure of 25 psf without damage.
 - 2. Flame Spread: 0-25 per ASTM E-84.
 - 3. Noise Reduction Coefficient (NRC): (.70 for nonrated perforated panel without filler strip)

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 SUBMITTALS:

- A Product Data: Manufacturer's published literature, including specifications.
- B Shop Drawings showing:
 - 1. Reflected ceiling plan indicating metal ceiling layout, ceiling mounted items and penetration locations.
 - 2. Suspension System, Carrier, and Component Layout.
 - 3. Details of system assembly and connections to building components.
- C Samples: Submit:
 - 1. Linear ceiling panels: Minimum 8-inch piece of each type and finish.
 - 2. Color samples: Manufacturers standard colors for Architect's selection.
 - 3. Suspension system components and moldings/trim.
- D Quality Assurance:
 - 1. Test Reports: Certified reports from independent agency substantiating structural compliance to wind loads and other governing requirements.

1.04 QUALITY ASSURANCE:

- A Manufacturer/Installer Qualifications:
 - 1. Provide metal ceiling system components produced by a single manufacturer with a minimum of 5 years experience in actual production of specified products and with resources to provide consistent quality in appearance and physical properties, without delaying the work.

2. Provide suspension system components produced by a single manufacturer to provide compatible components for a complete metal ceiling system installation.
3. Perform installation using a firm with installers having no less than 3 years of successful experience on projects of similar size and requirements.

1.05 DELIVERY, STORAGE AND HANDLING:

- A Deliver system components in manufacturer's original unopened packages, clearly labeled.
- B Store components in fully enclosed dry space. Carefully place on skids, to prevent damage from moisture and other construction activities.
- C Handle components to prevent damage to surfaces and edges, and to prevent distortion and other physical damage.

1.06 PROJECT CONDITIONS:

- A Begin system installations only after spaces are enclosed and weathertight, and after all wet work and overhead work have been completed.
- B Prior to starting installations, allow materials to reach ambient room temperature and humidity intended to be maintained for occupancy.

PART II PRODUCTS

2.01 MANUFACTURER:

- A Provide "Luxalon" metal ceiling system manufactured by Hunter Douglas Architectural Products Inc.: Norcross, GA PH.: (800) 366-4327.
- B Substitutions: Per Section 01 25 00 – Substitution Procedures.

2.02 CEILING PANEL MATERIALS:

- A Linear panels and suspensions for exterior shall be as scheduled on the drawings.

2.03 CEILING SYSTEM ACCESSORY MATERIALS:

- A Panel Splice: Formed aluminum insert designed to snap-fit between ends of two ceiling panels.
- B End Cap: Formed aluminum for snap-fit. Finish: to match ceiling panels.
- C Access Door: (2 feet x 2 feet) aluminum across frame with hinges and retainer clip for downward acting access panel to plenum space.

PART III EXECUTION

3.01 EXAMINATION:

- A Examine areas receiving linear metal ceiling system for conditions that might adversely affect the installation.
- B Verify that all work above ceiling system has been satisfactorily completed prior to start of ceiling installations.
- C Do not start ceiling installations until all unsatisfactory conditions affecting ceiling systems have been corrected.

3.02 PREPARATION:

- A Provide layouts for inserts, clips and other support items required to be installed by other trades. Furnish inserts, clips, and related items to other trades in a timely manner to preclude construction delays.
- B Coordinate with other trades for proper installation of inserts and related items.
- C Verify ceiling layouts by actual field measurements. Establish ceiling layout to balance borders and minimize out of square conditions. Coordinate all work that penetrates ceiling panels.

3.03 INSTALLATION:

- D Install linear metal ceiling system in accordance with manufacturer's printed installation instructions, submittals, applicable industry standards and governing regulatory requirements for the work.
- E Suspension System Installation:
 - 1. Install suspension system to comply with requirements of ASTM C-636.
 - 2. Support hangers securely from building structure using wires directly attached to structure, or to inserts or other devices with eye screws, by looping and wire tying.
 - 3. Install wind uplift struts at exterior locations at spacings to comply with structural requirements of governing codes.
- F Plenum Access:
 - 1. Install hinged access panels at location shown on drawings.
- G Install acoustical material above ceiling panels to comply with manufacturers instructions.
- H Install ceiling panels and trim pieces with neat, tight joints and to comply with approved details.
 - 1. Scribe and cut panels as necessary to fit at borders and other penetrations and install panel splices to comply with manufacturers instructions.
 - 2. Install end caps and edge molding trim at perimeter of linear metal ceiling system and at other locations where required to conceal edges of ceiling.
- I Install air distribution devices and lighting fixtures at indicated locations.
 - 1. Support devices and fixtures from building structure above, independent from ceiling suspension system.

3.03 ADJUST AND CLEAN:

- A Adjust components to provide uniform tolerances.
- B Replace all ceiling panels that are scratched, dented, or otherwise damaged.
- C Clean exposed surfaces with non-solvent, non-abrasive commercial type cleaner.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Furnish all labor, materials, equipment and supervision to provide and install vinyl base in areas where indicated on the drawings and as specified herein.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 PROJECT CONDITIONS:

- A Maintain 70° F. minimum temperature in room for 48 hours prior to installation, during installation, and 48 hours after installation. Maintain a minimum temperature of 55° F. thereafter.

1.04 QUALITY ASSURANCE:

- A Installation shall be by experienced and skilled mechanics, in accordance with the manufacturer's latest printed instructions.
- B Coordinate the requirements of adhesives and finish to assure compatibility between adhesive and wall finish.

1.05 SUBMITTALS:

- A Submit product data, certificates, and maintenance data in accordance with Division 1 requirements. Submit the following:
 1. Product data: For each type of product specified.
 2. Samples for Selection: In manufacturer's standard size for each product specified.

1.06 GUARANTEE:

- A Furnish to the Owner a written guarantee that all work required by this section will be free from defects of materials and workmanship for a period of one year from date of acceptance of the work by the Architect.

PART II PRODUCTS

2.01 MATERIALS:

- A Base shall be Thermoset vulcanized Rubber Base manufactured from 100% virgin synthetic rubber as manufactured by Johnsonite, Flexco Roppe, or Architect-approved substitute. Provide 1/8" gauge set-on cove base 4 inches high at all floors unless noted otherwise on the drawings. Provide base in 120 foot rolls. Color as noted on finish schedule.
- B Adhesive shall be types specified by the manufacturer. Adhesive for installing base shall be in accordance with manufacturer's written instructions.
- C Provide and install preformed base corners at all inside and outside corners.

PART III EXECUTION

3.01 INSPECTION:

- A The Contractor shall inspect substrate to receive new work prior to beginning work and shall bring any deficiencies, which would prevent him from producing an acceptable installation to the attention of the General Contractor. He shall not proceed until the deficiencies are corrected. In no case shall the correction of deficiencies in the substrate, required for successful installation, be cause for additional

charges to the Owner. In any event, start of work shall be construed by the Owner as acceptance by the Contractor, of the substrate for proper installation.

3.02 PREPARATION OF SURFACES:

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- C. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
- D. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

3.03 INSTALLATION:

- B Install resilient base at all wall-to-floor connections in which wall or floor has received a new or repaired surface treatment and where indicated on the drawings and around the base of all fixed base cabinets.

3.03 CLEANING AND PROTECTION:

- A Perform the following operations immediately after installing resilient products:
 - 1. Remove and replace all damaged, defective, scratched, and discolored base.
 - 2. Remove adhesive and other surface blemishes using cleaner recommended by the resilient product manufacturers.
 - 3. Sweep or vacuum floor thoroughly.
- B Clean according to manufacturer's recommendations.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A. Painting is required on all new and existing surfaces unless otherwise scheduled and/or as noted on the drawings and herein as specified.
- B. The term "paint" as used herein is all inclusive, meaning emulsions, enamels, oil paints, sealers, stains, varnishes, polyvinyl emulsions, latex emulsions and similar coatings.
- C. Before any paint material has been delivered to the job, submit a complete list of materials proposed for use, identifying each type of material by manufacturer's brand name, and no material shall be delivered to the job until the Architect's approval has been secured in writing. Approval will be of brands and quality, but not for results obtained.
- D. Painting will not be required on non-ferrous metal, putty, or glazing compound, masonry with integral color, or on factory finished items including equipment and galvanized wirework, except as may be specifically required elsewhere in the specifications.
- E. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- F. Conditions of Surfaces: It shall be the responsibility of each subcontractor to carefully inspect and examine surfaces or areas prepared to receive his work. Should he consider such surfaces or areas not proper or satisfactory for the installation or application of his work, he shall notify the Contractor in writing with copy to the Architect. Should he proceed before proper corrections have been made, it shall be at his own risk and any subsequent corrections that may be ordered or required shall be at his expense.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
- B. See Section 092900 Gypsum Wallboard for finish requirements for prime coat on Paperless Gyp. Bd.

1.03 DEFINITIONS:

- A. Flat: lusterless or matte finish with gloss range below 15 when measured at 85-degree meter.
- B. Eggshell: low-sheen finish with gloss range 5 to 20 when measured at 60-degree meter.
- C. Semi gloss: medium-sheen finish with gloss range 30 to 65 when measured at 60-degree meter.
- D. Full gloss: high-sheen finish with gloss range more than 65 when measured at 60-degree meter.

1.04 SUBMITTALS:

- A. Submit manufacturer's data including label analysis and instructions for handling, storing, and applying each material proposed for use. Include block fillers and primers.
- B. Provide certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- C. Where substitutions are approved, submit manufacturer's color charts for color selection.
- D. Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate if required by the Architect.

1.05 QUALITY ASSURANCE:

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
- B. Obtain primers, block fillers and undercoat paint for each system from same manuf. as finish coats.
- C. Provide primers compatible with finish system in strict accordance with manufacturer's recommendations. Upon request, furnish data for characteristics of finish materials to ensure compatible prime coats are used.
- D. Notify the Architect of problems anticipated using the materials specified.
- E. Provide the manufacturer's best quality paint material for each coating type specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
- F. Proprietary names used to designate colors or materials are not intended to imply that products named are required, or to exclude equal products of other manufacturers.
- G. No claim by the Contractor concerning the unsuitability of any material specified or his inability to produce satisfactory results therewith will be considered unless such claim is made in writing to the Architect before the Contract is signed.
- H. The Architect will select one room or surface to represent surfaces and condition for each type of coating and substrate to be painted, demonstrating finished colors textures. Final acceptance of colors will be given based on job-applied samples. After finishes are accepted, the Architect will use the room or surface to evaluate coating systems of a similar nature.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
 - 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well ventilated area at a minimum ambient temperature of 45° F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
- C. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.07 EXTRA MATERIALS:

- A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory- sealed containers for storage and identify with labels describing contents. Deliver extra materials to owner at close of Project.
- B. Furnish Owner with additional 5 percent, but not less than 1 gal of each material & color applied.

1.08 JOB CONDITIONS:

- A. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are 50° F -90° F.
- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are 45° F -95° F.
- C. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, at temperatures less than 5° F (3° C) above the dewpoint, or to damp or wet surfaces.
- D. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART II PRODUCTS

2.01 MANUFACTURERS:

- A. Products: Subject to compliance with requirements, provide one of the products in the paint schedules.
- B. Manufacturer's Names: The following manufacturers are referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:
 - 1. PPG Industries, Inc. (PPG).
 - 2. Sherwin Williams (SW).

2.02 PAINT:

- A. Paint shall be ready-mixed, except that tinting and thinning may be done at the job. The paint shall be suitable for spraying when thinned by not more than 12 percent by volume of thinner. All paint materials shall be delivered in original unopened containers with labels intact and legible.
- B. Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- C. Provide manufacturer's best-quality paint material of the various coating types specified. Paint- material containers not displaying manufacturer's product identification will not be acceptable.
- D. Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- E. Colors: Match colors indicated by reference to manufacturer's color designations.

2.03 COLORS AND SPECIMENS FOR APPROVAL:

- A. Colors and finishes shall be as indicated on the drawings. If not scheduled on the drawings, colors shall be as selected by the Architect. Before any work is done, the Architect will furnish the Contractor with a set of color cards and a schedule showing where the various colors shall go. The Contractor shall then prepare samples at the job as required until the colors and textures are satisfactory. Wood used to display stains shall be the same kind on which the stain is to be used.
- B. The Contractor, if requested by the Architect, shall finish one complete room, space, or item, for each color scheme or finish required, showing selected colors, finished texture, materials and workmanship. After approval, these sample rooms or items shall serve as standard for similar work throughout the building.

PART III EXECUTION

3.01 EXAMINATION:

- A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
- B. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
- C. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

3.02 GENERAL REQUIREMENTS:

- A. Maintain temperature of rooms where varnish or enamel is being applied at 70 degrees or more, and at 50 degrees or more during other interior painting. Do exterior painting only when temperature is 50 degrees or higher, and in dry weather.
- B. Apply all materials under adequate illumination, evenly spread and smoothly flowed on without runs or sags. Only skilled workmen shall be employed.
- C. Vary tints of succeeding coats slightly to permit identification of coats.
- D. If any paint is applied to damp material or improperly prepared surfaces; the Contractor shall use such corrective measures as determined by the Architect.
- E. Protect all adjacent work and materials by suitable covering, or other methods, during progress of the work. Upon completion, remove all paint spots from floors, glass and other surfaces.
- F. Store and mix paint materials only in spaces designated and assigned for the purpose. Do not permit paint or oil soaked rags or waste to accumulate. Exercise strict precautions at all times against fire.
- G. Side edges of wood doors shall be finished same as faces. Top and bottom edges shall have adequate sealer coatings applied immediately after fittings.
- H. Covering shall be complete. When color, stain, dirt, or undercoats show through the final coat of paint, apply additional coats until the finish is of uniform color and appearance and coverage is complete.
- I. Paste wood filler, when set, shall be wiped across the grain, then with the grain, to secure a clean surface.
- J. Enamel, varnish, or oil finish applied to wood or metal shall be sanded between coats with fine sandpaper to produce an even, smooth finish.
- K. Before painting, remove hardware, accessories, plates, lighting fixtures and similar items, or provide ample protection for such items. Upon completion of each space, replace above items. Remove doors, if necessary, to paint bottom edge. Use only skilled workmen for removing and connecting above items.
- L. Paint all new exterior wood.
- M. Paint all interior wood.
- N. Paint all new metal structure exposed in interior of building.
- O. When painting existing surfaces or new work cut into existing surfaces, new paint coverage shall extend corner to corner and floor to ceiling covering the entire plane of the surface in question.

3.03 PREPARATION OF SURFACES:

- A. Wood surfaces shall be sandpapered to a smooth and even surface and dusted off. After priming or stain coat has been applied, thoroughly fill nail or other holes and cracks with plastic wood or putty; for natural finish work, filler (if required) shall be colored to match wood.
- B. On metal surfaces, remove grease, rust, scale and dust, and touch up any abraded place on items that have been shop coated. Where steel or iron has a heavy coating of scale, it shall be removed by wire-brushing or sandblasting as necessary to produce satisfactory painting surface.
- C. Chemically treat galvanized metal surfaces with a compound for this purpose, in accordance with the manufacturer's directions for use, before applying the first coat of paint.
- D. Concrete block surfaces: Wire brush to remove loose materials.
- E. Exposed concrete: Wire brush to remove loose mortar. Patch and repair surfaces for uniform texture.
- F. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
- G. Backpriming: All concealed surfaces of painted wood shall be backprimed. Spot prime all ends of trim.
- H. Touch up bare areas of shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.
- I. Clean galvanized surfaces with non-petroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- J. Between coats of polyurethane prime coat rub with steel wool and allow overnight drying.

3.04 PROTECTION:

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by the Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
- C. At completion of construction activities of other trades, touch and restore damaged or defaced painted surfaces.

3.05 CLEANING:

- A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.06 SCHEDULE OF PAINTING:

GENERAL:

- 1. All items listed in the following paint schedule may not apply to this project.
- 2. Numbers of coats listed in this schedule are minimum. If coverage is not complete and uniform, additional coats must be added until the finished surface is satisfactory and accepted by the Architect.
- 3. Omit primer on metal surfaces that have been shop primed and touch-up painted.

4. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
5. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
6. Where graphics are shown on the drawings they shall be applied in two (2) coats of Latex Enamel with two (2) coats of clear acrylic applied over finished graphics. Graphics shall be applied by an approved professional sign painter.
7. Electric Panel Boxes: Two (2) coats Rustoleum over prime coat.
8. Exposed Pipe, Pipe Hangers, Sprinkler Pipe, Sprinkler Pipe Hangers, Supports etc.: Two (2) coats satin enamel over metal primer.
9. Exposed Ductwork: Two (2) coats satin enamel over one (1) coat metal primer for galvanized.
10. Wood Doors Not Factory Finished: Stain followed by one (1) coat sealer primed followed by two (2) coats satin-clear varnish.
11. Specific finishes listed in the finish schedule on the drawings take precedence over the finishes listed below. Luster levels indicated or scheduled on drawings shall take precedence over those specified below. If they differ, provide like product below in luster indicated on drawings.

B. EXTERIOR:

1. Metal: Provide the following finish system over miscellaneous ferrous metal, structural, hollow metal doors and frames, louvers:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a rust-inhibitive primer:

Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils:
PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.
SW: DTM Acrylic Primer/Finish, B66W1 (OR) Kem Kromik Universal Metal Primer, B50Z (Alkyd).

First and Second Coats: Semi gloss, exterior, acrylic –latex enamel applied at spreading rate recommended by manuf. to achieve total dry film thickness of not less than 2.6 mils.
PPG: 78 Line Sun-Proof Semi-Gloss House and Trim Paint.
SW: A100 Exterior Acrylic Gloss A8 Series or Metalatex Exterior Semi-gloss Coating, B42-100.
2. Non-Ferrous Metal: Galvanized. (Acid etch galvanized surfaces that have not weathered at least six months prior to beginning painting operations). Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a galvanized metal primer.

Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.
ICI: 4020 Devflex DTM; Flat Int./Ext. Waterborne Primer /Finish.
PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.
SW: DTM Acrylic Primer/Finish, B66W1.

First and Second Coats: Semi gloss, exterior, acrylic-latex enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.6 mils.

PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.

SW: A100 Exterior Acrylic Gloss A8 Series (OR) Metalatex Exterior Semi-gloss Coating, B42-100.

3. Aluminum surfaces in contact with masonry or steel to have a coat of zinc chromate.
4. Smooth Wood and PVC pipe columns: Provide the following finish systems over smooth wood siding and other smooth, exterior wood surfaces:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a primer.

Primer: Exterior, alkyd or latex wood primer, as recommended by the manufacturer for this substrate, applied at a spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.5 mils.

PPG: 72-1 Sun-Proof Exterior House & Trim Wood Primer-Flat Latex.

SW: (Wood) A100 Exterior Latex Primer, B42W41; (PVC) PrepRite Bonding Primer, B51W50.

CW: 330 Optima All Prime Acrylic

First and Second Coats: Semi gloss, waterborne, exterior, acrylic enamel applied at a spreading rate recommended by the manuf. to achieve a total dry film thickness of not less than 2.4 mils.

PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.

SW: A100 Exterior Acrylic Gloss A8 Series (OR) Metalatex Exterior Semi-gloss Coating, B42-100.

C. INTERIOR:

1. Concrete Masonry Units: provide the following finish systems over interior concrete masonry block units:

Gloss, Acrylic Finish: Two (2) finish coats over a block filler.

Block Filler: High-performance, latex-based, block filler applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 5.0 mils.

PPG: 6-7 Speedhide Interior/Exterior Masonry Latex Block Filler.

SW: Pro Industrial Heavy Duty Block Filler.

First and Second Coats: Low-Luster (eggshell or stain), acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.8 mils.

SW: Pro Industrial Multi-Surface Acrylic, Gloss, B66-1500 Series.

Substitutions: Per 01 25 00 – Substitution Procedures.

2. Epoxy Painted Concrete Masonry Units: provide the following finish systems over interior concrete masonry block units:

Semi-gloss Polyamid Epoxy Finish: Two (2) finish coats over a block filler.

Block Filler: Heavy Duty Acrylic block filler applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 12mils.

PPG: 16-90 Pit-Glaze Heavy Duty Acrylic Block filler

SW: Heavy Duty Block Filler, B42W46.

First and Second Coats: Semi-Gloss Polyamide Epoxy applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than 5 mils.

PPG: 97 Line Aquapon Polyamide Epoxy Semi-Gloss Coating.

SW: Tile Clad H.S. Epoxy, B62Z-100 Series (Eg-Shel) or B70-200 Semi-gloss.

3. Gypsum Board: provide the following finish systems over interior gypsum board surfaces:

Flat Acrylic Finish: Two (2) finish coats over a primer. (Walls scheduled to receive wall fabric shall receive one coat of Latex Primer – Tint Primer to match wall fabric).

Primer: Latex – based, interior primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

PPG: 17-10 Quick-Drying Interior Latex Primer-Sealer.

SW: PrepRite 200 Latex Wall Primer, B28W200.

First and Second Coats: Flat, acrylic-latex based, interior paint applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.5 mils.

PPG: 80 Line Wallhide Interior Wall Flat Latex Paint.

SW: ProMar 400 Latex Flat Wall Paint, B30W400.

4. Painted Interior Wood Surfaces: Provide the following paint finish systems over new, interior wood surfaces.

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a wood undercoater. (Omit undercoater on previously painted surfaces.

Undercoat: Alkyd – or acrylic-latex based, interior wood undercoater, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

PPG: 6-755 Speedhide Interior Water-Based Undercoater.

SW: PrepRite ProBlock Latex Primer/Sealer, B51W20.

First and Second Coats: Semi gloss, acrylic-latex, interior enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.6 mils.

PPG: 88-110 Satinhide Interior Enamel Wall and Trim Lo-Lustre Semi-Gloss Latex.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

5. Stained Woodwork: Provide the following stained finish over new, interior woodwork :

Waterborne, Satin-Varnish Finish: Two (2) finish coats of a waterborne, clear-satin varnish over a sealer coat and a waterborne, interior wood stain.

Stain Coat: Waterborne, interior wood stain applied at spreading rate recommended by manuf.

PPG: 77-302 Rez Interior Semi-Transparent Stain.

SW: Wood Classic Interior Oil Stain, A49-200.

Sealer Coat: Clear sanding sealer applied at spreading rate recommended by manuf.

PPG: 77-30 Rez Interior Quick-Drying Sealer and Finish.

SW: Wood Classic Fast Dry Sanding Sealer, B26V43.

First and Second Finish Coats: Waterborne varnish finish applied at spreading rate recommended by manufacturer.

PPG: 77-49 Rez Satin Acrylic Clear Polyurethane.

SW: Wood Classic Water Borne Polyurethane Varnish A68 Series.

6. Painted Ferrous Metal (Hollow Metal doors and frames, electrical panel boxes etc.): Provide the following finish over interior metal work.

Semi gloss Acrylic-Enamel Finish: One finish coat over an enamel undercoater and a primer. (Omit primer on shop primed items)

Primer: Quick-drying rust-inhibitive, alkyd-based or epoxy-metal primer, as recommended by manufacturer for this substrate, applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than 1.5 mils.

PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.

SW: Kem Kromik Universal Metal Primer, B50Z Series.

Undercoater: Alkyd, interior enamel undercoat or semi gloss, acrylic-latex, interior enamel as recommended by the manufacturer for this substrate, applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 1.3 mils.

PPG: 6-6 Speedhide Interior Quick-Drying Enamel Undercoater.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

Finish Coat: Semi gloss, acrylic-latex, interior enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 1.3 mils.

PPG: 88-110 Satinhide Interior Enamel Wall and Trim Lo-Lustre Semi-Gloss Latex.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

7. Non-Ferrous Metal: Galvanized. Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a galvanized metal primer.

Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.

SW: DTM Acrylic Primer/Finish, B66W1.

First and Second Coats: Semi gloss, acrylic-latex enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.6 mils.

PPG: 88-110 Satinhide Interior Enamel Wall and Trim Lo-Lustre Semi-Gloss Latex.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

8. Metal Decking, Bar Joists, exposed metal structure (non-galvanized): Provide the following finish systems over shop primed metal surfaces:

Flat Waterborne Acrylic Dry Fall Finish: Two (2) coats applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of 4 mils.

PPG: Spedhide Latex dry Fog Flat Spray Paint, 6-715

SW: Waterborne Acrylic Dryfall, Flat, B42W1

9. Aluminum surfaces in contact with masonry or steel to have a coat of zinc chromate.

3.07 MECHANICAL AND ELECTRICAL ITEMS:

- A. All equipment such as pumps, tanks, air units, compressors, cabinets, etc., that have had their paint defaced, scarred or skinned shall be touched up with machinery enamel.

PPG: Lavax Machinery Enamel, 23- Line.

SW: Steel Spec Fast Dry Alkyd Enamel, B55W811.

- B. All uncovered pipe hangers, tank stands, equipment support stands and brackets, uncovered portions of tank, and other mechanical apparatus, including factory finished items, shall be painted as scheduled above for painted ferrous metal.

- C. All hot water, cold water, steam, condensation, circulating water lines for heating and cooling, drains gas piping, electrical conduit, junction boxes and similar items exposed shall be painted as scheduled above for painted ferrous metal, galvanized metal or Aluminum Metal-lite, as appropriate for the substitute.

- D. All electrical panel boxes, box covers, conduit junction boxes, brackets and accessories except those in electrical rooms shall have field finish paint, as scheduled above for ferrous metal over prime finish, or factory finish.
- E. Exposed Ductwork: As scheduled above for galvanized metal. Interior of ducts exposed to view shall be painted flat black for the first two (2) feet beyond grill or diffuser.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A. Furnish all materials, labor, equipment, and supervision necessary to provide and install signage as shown on the drawings and specified herein.

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 WARRANTY:

- A. Provide manufacturers standard warranty.

PART II PRODUCTS

2.01 INTERIOR SIGNAGE MANUFACTURERS

- A. Provide specified sign products as manufactured by:
 - 1. Scott Sign Systems (by Identity Group), Nashville, TN, 615-515-9008.
- B. Manufacturers pre-approved to provide alternate, equal products meeting the specified requirements include the following:
 - 1. APCO Signs
 - 2. ASI Sign System
 - 3. InPro Corporation
 - 4. Vomar Products, Inc.
 - 5. Additional alternate manufacturers must be approved by Architect prior to bidding.

2.02 INTERIOR SIGNAGE

- A. Provide and install signage of type, color, thickness and mounting style as indicated on the drawings. If not indicated on the drawings, provide and install signage equal to molded polymer "Square Corner ADA Plaques" as manufactured by Scott Sign Systems.
 - 1. Size: 6" x 9" with square corners
 - 2. Color: As selected by Architect from manufacturer's full range of color selections.
 - 3. Thickness: 1/8"
 - 4. Mounting: Factory-applied Very High Bond (VHB) Tape
- B. Signs shall read as indicated below: Each shall have a graphic symbol, the applicable international symbol of accessibility and Grade 2 Braille as required by the Americans with Disabilities Act. Model numbers indicated are of Scott Sign Systems.
 - 1. Doors into accessible restrooms indicated for male use shall have a sign which reads "MEN" and shall have man and ADA graphic equal to model #APMENA69.
 - 2. Doors into restrooms indicated for male use shall have a sign which reads "MEN" and shall have man graphic equal to model #APMEN69.
 - 3. Doors into accessible restrooms indicated for female use shall have signs which reads "WOMEN" and have the woman and ADA graphic equal to model #APWOMA69.
 - 4. Doors into restrooms indicated for female use shall have signs which reads "WOMEN" and have woman graphic equal to model #APWOM69.

5. Doors into accessible restrooms indicated for use by both sexes shall have a sign which reads "RESTROOM" and have the unisex graphic showing both a male and female character and ADA graphic equal to model #APRESA69.
6. Doors into restrooms indicated for use by both sexes shall have a sign which reads "RESTROOM" and have the unisex graphic showing both a male and female character equal to model #APRES69.
7. Doors into Stairways shall have a sign which reads "STAIRS" and shall have an ADA-compliant graphic equal to model #APSTR69.
8. Elevator doors not on the level of egress shall have a sign which reads "IN CASE OF FIRE USE STAIRS" and ADA-compliant graphic equal to model #APINC69.
9. Doors indicated on the drawings as an egress door shall have a sign which reads "EXIT" and shall have ADA-compliant graphic equal to model #APEXT69.

2.03 EXTERIOR SIGNAGE

A. Post and Panel Site Signs:

1. Handicapped Parking Signs shall be as indicated on drawings. If not indicated, signs shall be RT-8 and R7-8D Type, as required by the ADA, 12" x 18" center post 7' height to bottom of sign. Van accessible space shall have the words "Van Accessible" on the bottom of the sign. Provide and install one sign per accessible parking space.
2. Aluminum Sheet: Alloy and temper recommended by the aluminum producer and finisher for the type of use and finish indicated, and with at least the strength and durability properties specified in ASTM B 209 for 5005-H15 alloy.
 - a. Panel Material: 0.125-inch-thick aluminum plate.
 - b. Panel Finish: Baked enamel.
 - c. Corner Condition: Corners rounded to 2" radius.
 - d. Surface-Applied, Die-Cut Vinyl Copy: Provide die-cut characters from nonreflective vinyl film with pressure-sensitive adhesive backing. Apply copy to exposed face of sign panel.
3. Steel Tubing: Cold-formed steel tubing conforming to ASTM A 500, Grade B, hot-dip galvanized after fabrication with a minimum of 2.0 oz. of zinc/sq. ft. of surface area conforming to ASTM A 123.
4. Vinyl Film: Opaque, nonreflective vinyl film, 0.0035-inch minimum thickness, with pressure-sensitive adhesive backing, suitable for exterior applications.
5. Colored Coatings for Plastic Sheet: Use nonfading colored coatings, including inks and paints for copy and background colors, which are recommended by the manufacturers for optimum adherence to the type of surface used.
6. Concrete for Post Holes: Mix Portland cement complying with ASTM C 150, aggregates complying with ASTM C 33, and clean water to obtain concrete with a minimum 28-day compressive strength of 2500 psi. Use at least 4 sacks of cement/cu. yd., 1-inch maximum-size aggregate, maximum 3-inch slump, and 2 to 4 percent entrained air.
7. Steel Posts: 0.120-inch, galvanized, seamless, square steel posts in length adequate for mounting method specified. Include post caps, fillers, spacers, junction boxes, access panels, and related accessories required for a complete installation. Comply with the following requirements for post shape, finish, and mounting method indicated:
 - a. Post Size: 3 by 3 inches square.
 - b. Post Mounting Method: Provide sign posts of length required for permanent installation by direct-burial mounting method.

PART III EXECUTION

3.01 SIGNAGE

- A. Provide and install signage where indicated on drawings.
- B. Whether or not shown on drawings provide and install interior signage in the following locations:
 - 1. At doors into all toilet rooms
 - 2. At doors indicated as a means of egress.

3.02 INSTALLATION:

- B. Locate signs where indicated on the drawings and in strict accordance with ADA regulations.
- C. Install in accordance with manufacturers recommendations.
- D. Installation of Panel and Post Signs:
 - 1. Excavation: In firm, undisturbed or compacted soil, drill or (using a post-hole digger) hand-excavate holes for each post to the minimum diameter recommended by sign manufacturer, but at least 4 times the largest post cross-section.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

- A Provide all materials, labor, equipment, and supervision necessary to design, fabricate, deliver, and install one dedication plaque as shown on the drawings and as specified herein.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 SUBMITTALS:

- A Submit shop drawings in accordance with Section 01 30 00 – Administrative Requirements.
- B The Architect, upon written request from the Contractor, will furnish a schematic layout for the plaque which will include the following information:
 - Name of the School
 - Date of Completion
 - Name of Director of Schools
 - Names of School Board Members (6 Board Members)
 - Name of County Executive
 - Names of County Commissioners (18 County Commissioners)
 - Name of Architect
 - Name of Contractor
- C Before casting, the Contractor shall submit a full scale rubbing of the proposed plaque layout for approval.

PART II PRODUCTS

2.01 MATERIALS:

- A Plaque shall be 24 inches by 30 inches cast bronze with lettering (verify Helvetica Medium) on pebble background texture and No. 4 flat band bevel border, as manufactured by ARK Ramos, Gemini, or The Southwell Company.
 - 1. Hidden Fasteners: As recommended for specific substrate and provided by plaque manufacturer.

PART III EXECUTION

3.01 INSTALLATION:

- A Proposed location shown on drawings. Verify location of new plaque with the Architect at the site prior to installation.
- B Install plaque in accordance with manufacturer's recommendations.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Solid plastic toilet compartments.

1.02 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Concealed steel support members.
- B. Section 10 28 00 – Toilet Room Accessories.

1.03 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.
- C. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

- A. See Section 01 30 00 – Administrative Requirements.
- B. Product Data: Provide 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. Shop Drawings: Provide layout drawings and installation details with location and type of hardware required.
- D. Samples: Submit two samples of partition panels, illustrating panel finish, color, and patterns.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A company regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.
- B. Installer Qualifications: A company regularly engaged in installation of products specified in this Section, with a minimum of 5 years' experience.
- C. Materials: Doors, panels and pilasters, constructed from high density polyethylene (HDPE) resins. Partitions to be fabricated from polymer resins compounded under high pressure, forming a single component which is waterproof, nonabsorbent and has a self-lubricating surface that resists marks from pens, pencils, markers and other writing instruments. Cover all plastic components with a protective plastic masking.
- D. Performance Requirements:
 - 1. Fire Resistance: Partition materials shall comply with the following requirements, when tested in accordance with ASTM E 84:
 - a. Class A flame spread/smoke developed rating.
 - 2. Material Fire Ratings:
 - a. National Fire Protection Association (NFPA) 286: Pass.
 - b. International Code Council (ICC): Class B.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.08 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.09 WARRANTY

- A. Manufacturer guarantee of plastic against breakage, corrosion, and delamination under normal conditions for 25 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. Labor not included in warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Solid Plastic Toilet Compartments:
 - 1. Scranton Products: www.scrantonproducts.com.
 - 2. Bradley Corporation: www.bradleycorp.com.
 - 3. Hadrian Incorporated: www.hadrian-inc.com.
 - 4. Substitutions: Per Section 01 25 00 – Substitution Procedures.

2.02 SOLID PLASTIC TOILET COMPARTMENTS

- A. Basis of Design:
 - 1. Hiny Hiders Toilet Partitions by Scranton Products.
 - a. Style: Floor mounted, overhead braced.
- B. Doors, Panels, and Pilasters: 1 inch (25 mm) thick with all edges rounded to a radius. Mount doors and dividing panels based on height of specified system.
 - 1. Door and Panel Height: 72 inches (1829 mm).
 - 2. Door Design: Basic flat panel.
 - 3. Panel Edge: Standard.
 - 4. Panel Edge: Shiplap.
 - 5. Pilasters: 82 inches (2083 mm) high and fastened to floor.
- C. Panels:
 - 1. Pattern: Orange Peel.
 - 2. Color: As noted on drawings.
- D. Pilaster Shoes: 3 inches (76 mm) high type 304, 20 gauge stainless steel. Secured to pilasters with a stainless steel tamper resistant Torx head sex bolt.
- E. Headrail: Heavy-duty extruded 6463-T5 alloy aluminum with anti-grip design. Finish to be clear anodized. Fastened to headrail brackets with stainless steel tamper resistant Torx head sex bolt, and fastened at the top of the pilaster with stainless steel tamper resistant Torx head screws.
 - 1. Headrail Brackets: 20 gauge stainless steel with satin finish. Secured to the wall with stainless steel tamper resistant Torx head screws.
- F. Wall Brackets:
 - 1. Brackets are fastened to pilasters with stainless steel tamper resistant Torx head screws and fastened to the panels with stainless steel tamper resistant Torx head sex bolts.
 - 2. Bracket Type: Stirrup double ear aluminum.
- G. Door Hardware:
 - 1. Continuous Aluminum Hinge:
 - a. Length: 71 inches (1803 mm).
 - 2. Stainless Steel Paddle Latch and Housing: Heavy-duty stainless steel type 304. Bright finish.
 - 3. Provide occupancy indicator.
 - 4. One coat hook/bumper and door pull made of chrome plated Zamak, mounted on door.

5. Equip outswing handicapped doors with second door pull and door stop.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Examine areas to receive toilet partitions, screens, and shower compartments for correct height and spacing of anchorage/blocking and plumbing fixtures that affect installation of partitions. Report discrepancies to the architect.

3.03 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions and laid out as shown on shop drawings.
- B. Clearance at vertical edges of doors shall be uniform top to bottom and shall not exceed 3/8 inch (9.5 mm).
- C. No evidence of cutting, drilling, and/or patching shall be visible on the finished work.
- D. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.
- E. Finished surfaces shall be cleaned after installation and be left free of imperfections.

3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Repair or replace damaged products before Substantial Completion.

END OF SECTION

PART I GENERAL

1.01 SCOPE:

A Furnish and install toilet room accessories and miscellaneous accessories as listed herein and shown on the drawings.

1.02 RELATED DOCUMENTS:

A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 SUBMITTALS:

A Submit to the Architect for approval a brochure containing catalog cuts and full description of accessories proposed for use and a schedule of accessories.

PART II PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A Accessories shall be specified or indicated model numbers by specified or indicated manufacturers unless alternate products are approved by Architect prior to bidding. Additional alternate manufacturers must be approved by Architect prior to Bidding and provide product equal to or exceeding specified requirements. Acceptable manufacturers include Bobrick Washroom Equipment, Inc., American Specialties Inc., Bradley Corporation and Frost Products Ltd.

2.02 TYPE OF ACCESSORIES:

A Mirrors shall be as noted on drawings.

B Toilet accessories shall be as scheduled on the drawings. If manufacturers and/or model numbers are not indicated on the drawings, provide the accessories indicated below for each accessory shown on the drawings. Accessories in this schedule may or may not apply to this project.

- | | | |
|----|---|-------------------------|
| 1. | Soap Dispenser: | Bradley Model 6A01. |
| 2. | Paper Towel Dispenser/Waste Receptacle: | Bradley Model 2A05-11. |
| 3. | Toilet Paper Dispenser: | Bradley Model No. 5263. |
| 4. | Toilet Stall Grab Bars – 42, 18, and 36 inch: | Bradley 812 Series. |
| 5. | Mop Rack: | Bradley Model 9933. |
| 6. | Feminine Napkin Receptacle: | Bradley Model 4A10. |
| 7. | Robe Hook: | Bradley Model No. 9114 |

2.03 UNDERCOUNTER PIPE GUARDS:

A Where undercounter pipes are exposed to view and as required by ADA guidelines, provide soft, resilient molded-vinyl pipe guards equal to Trubro Lav Guard as manufactured by IPS Corporation of Collierville, TN in model numbers, sizes and lengths required for the pipes indicated. Guards shall be virtually indestructible with a nominal wall of 1/8" with internal ribs. Guards shall be self-extinguishing according to ASTM D635 tests and result in zero mold growth according to ASTM G21 and G22 testing. Must be capable of being wiped clean using common detergents.

PART III EXECUTION

2.04 INSTALLATION:

- A Accessories shall be substantially secured in place with fastenings most suitable for the construction to which they are fastened. All exposed fasteners shall be stainless steel or chromium plated brass and shall be Phillips Head Screws or Bolts.
- B The exact location of accessories shall be as directed by the Architect.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.
- C. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 04 20 00 – Unit Masonry: Substrate for products in this section.

1.03 REFERENCE STANDARDS

- A. FM (AG) - FM Approval Guide; current edition.
- B. NFPA 10 - Standard for Portable Fire Extinguishers; 2017.
- C. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.05 FIELD CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Extinguishers:
 - 1. Ansul, a Tyco Business: www.ansul.com.
 - 2. Larsen: www.larsensmfg.com.
 - 3. Substitutions: See Section 01 25 00 – Substitution Procedures.
- B. Fire Extinguisher Cabinets and Accessories:
 - 1. Activar Construction Products Group - JL Industries: www.activarcpg.com.
 - 2. Ansul, a Tyco Business: www.ansul.com.
 - 3. Larsen's Manufacturing Co: www.larsensmfg.com.
 - 4. Substitutions: See Section 01 25 00 – Substitution Procedures.

2.02 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 - 1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.
- B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
 - 1. Class: A:B:C type.
 - 2. Size: 10 pound.

2.03 FIRE EXTINGUISHER CABINETS

- A. Cabinet Construction: Non-fire rated.
 - 1. Formed aluminum; 0.036 inch thick base metal.
- B. Fire Rated Cabinet Construction: One-hour fire rated.
 - 1. Steel; double wall or outer and inner boxes with 5/8 inch thick fire barrier material.

- C. Cabinet Configuration: Surface mounted.
 - 1. Size to accommodate accessories.
 - 2. Trim: Flat square edge, with 1 1/2 inch wide face.
- D. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with roller type catch. Hinge doors for 180 degree opening with two butt hinge.
- E. Door Glazing: Acrylic plastic, clear, 1/8 inch thick, flat shape and set in resilient channel glazing gasket.
- F. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
- G. Weld, fill, and grind components smooth.
- H. Finish of Cabinet Exterior Trim and Door: Powder coated steel.
- I. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

- A. Extinguisher Brackets: Formed steel, chrome-plated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level on wall surfaces, 48 inches from finished floor to highest operable part.
- C. Secure rigidly in place.
- D. Place extinguishers in cabinets.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Freestanding shop fabricated metal canopies.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete footings.
- B. Section 09 91 00 – Painting.

1.03 REFERENCE STANDARDS

- A. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2016.
- B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014 (Editorial 2017).
- E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- F. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel; 2015.
- G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.
- H. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process; 2017a.
- I. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014a.
- J. ASTM E2950 - Standard Specification for Metal Canopy Systems; 2014.
- K. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2017.
- L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
- M. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit product data sheets, including material descriptions and finishes, and preparation instructions and recommendations.
- C. Shop Drawings: Prior to commencement of fabrication, submit detailed shop drawings, showing profiles, sections of components, finishes, and fastening details.
- D. Design Data: Submit comprehensive structural analysis of design for the specified loads. Stamp and sign calculations by professional engineer.
- E. Designer's Qualification Statement.
- F. Manufacturer's Qualification Statement.
- G. Erector's Qualification Statement.

- H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Perform design under direct supervision of a Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
 - 1. Comply with applicable code for submission of design calculations as required for acquiring permits.
 - 2. Cooperate with regulatory agency or authorities having jurisdiction (AHJ), and provide data as requested.
- B. Perform work in accordance with AISC 303.
- C. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.
 - 1. Not less than five years of documented experience.
- D. Erector Qualifications: Company specializing in performing the work of this section.
 - 1. Not less than five years of documented experience and approved by canopy manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site ready for erection.
- B. Package using methods that prevent damage during shipping and storage on site.
- C. Store materials under cover and elevated above grade.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Metal Canopies: Correct defective work within a two year period after Date of Substantial Completion.
- C. Finish Warranty: Provide manufacturer's one year warranty on factory finish against cracking, peeling, and blistering.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Canopies:
 - 1. Austin Mohawk, Inc: www.austinmohawk.com.
 - 2. Duo-Gard: www.duo-gard.com.
 - 3. Madison Industries: www.madisonind.com.
 - 4. Substitutions: 01 25 00 - Substitution Procedures.

2.02 METAL CANOPY

- A. Shop Fabricated Metal Canopy
 - 1. Pre-engineered system complying with ASTM E2950.
 - 2. Design and fabricate metal canopy system to resist wind, snow, live, and seismic loads without failure, damage, or permanent deflection in accordance with ASCE 7:
 - a. Loads: As indicated on drawings.
 - 3. Thermal Movement: Design canopy system to accommodate thermal movement caused by ambient temperature range of 120 degrees F and surface temperature range of 180 degrees F without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects on assembly components.
- B. Configuration: Column layout, canopy clearance, fascia profile, and roof covering design as indicated on drawings.

2.03 COMPONENTS

- A. Structural Steel Framing:
 - 1. Columns: ASTM A500/A500M, Grade B, rectangular tubing, sized to suit project design load requirements.

2. Base and Top Plates: ASTM A36/A36M, with pre-drilled bolt holes.
3. Beams: Wide flange, ASTM A572/A572M, Grade 50.
4. Other Structural Steel Members: ASTM A36/A36M.

B. Covering:

1. See Section 08 84 10 – Corrugated Polycarbonate Panels.

D. Anchor Bolts: ASTM A307 or ASTM A572/A572M, formed with straight shank, assembled with template for casting into concrete.

1. Minimum exposed thread of 7 inches above footing and 23 inch minimum embedment.
2. Provide nuts and washers as required for column leveling and plumbing.

E. Concrete Footings: Refer to Section 03 30 00 for additional requirements.

2.04 SHOP FABRICATION

- A. Provide a complete system ready for erection at project site.
- B. Shop fabricate to the greatest extent possible; disassemble if necessary for shipping.
- C. Perform welding in accordance with AWS D1.1/D1.1M.
- D. Fabricate connections for bolt, nut, and washer connectors.

2.05 FINISHES

A. Structural Steel Framing:

1. Shop Primer: Rust-inhibitive red oxide.
2. Finish Coating: As specified in Section 09 91 00.

2.06 ACCESSORIES

- A. Structural Bolts: ASTM F3125/F3125M, Grade A325, minimum 3/4 inch diameter.
- B. Trim, Closure Pieces, and Flashings: Factory-fabricated to required profiles.
 1. Exposed Fasteners: Same finish as panel system.
- C. Grout: ASTM C1107/C1107M; non-shrinking; premixed compound consisting of non-metallic aggregate, cement, water-reducing and plasticizing agents.
- D. Fasteners, Non-Structural: ASTM F593 stainless steel or ASTM A307 carbon steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates and site area for conditions that might prevent satisfactory installation.
- B. Verify that foundation, electrical utilities, and placed anchors are in correct position.
- C. Verify that bearing surfaces are ready to receive this work.
- D. Do not proceed with installation until all conditions are satisfactory.

3.02 INSTALLATION - FRAMING

- A. Erect framing in accordance with AISC 303.
- B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation.
- C. Set column base plates with non-shrink grout to achieve full plate bearing.
- D. Fasten columns to anchor bolts.
- E. Do not field cut or alter structural members without approval.

- F. After erection, prime welds, abrasions, and surfaces not shop primed.

3.03 INSTALLATION - CANOPY COVERING

- A. Install in accordance with manufacturer's instructions.
- B. Fasten metal decking to steel support members, aligned level and plumb.
- C. Install fascia panels, trim, and flashing.
- D. Separate dissimilar metals using concealed bituminous paint.
- E. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.04 TOLERANCES

- A. Maximum Variation from Level: Plus/Minus 1/8 inch.

3.05 CLEANING

- A. Clean surfaces of dust and debris; follow manufacturer's cleaning instructions for the finish used.

3.06 PROTECTION

- A. Protect canopy after installation to prevent damage due to other work until Date of Substantial Completion.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Countertops for manufactured casework.
- B. Wall-hung counters and vanity tops.

1.02 RELATED REQUIREMENTS

- A. Section 06 41 00 - Architectural Wood Casework.

1.03 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2009.
- B. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.
- C. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2014.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.
- E. AWI (QCP) - Quality Certification Program; current edition at www.awiqcp.org.
- F. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).
- G. AWMAC (GIS) - Guarantee and Inspection Services Program; current edition at www.awmac.com/gis.php.
- H. IAPMO Z124 - Plastic Plumbing Fixtures; 2017.
- I. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
- J. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.
- K. PS 1 - Structural Plywood; 2009.

1.04 SUBMITTALS

- A. See Section 01 30 00 - 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. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- F. Sustainable Design Submittal: Documentation for sustainably harvested wood-based components.
- G. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- H. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- I. Installation Instructions: Manufacturer's installation instructions and recommendations.
- J. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 COUNTERTOPS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
- B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
 - 1. Flat Sheet Thickness: 1/2 inch, minimum.
 - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Manufacturers:
 - 1) Avonite Surfaces: www.avonitesurfaces.com.
 - 2) Dupont: www.corian.com.
 - 3) Formica Corporation: www.formica.com.
 - 4) Meganite, Inc: www.meganite.com.
 - 5) Relang International, LLC; DURASEIN: www.duraseinusa.com.
 - 6) Wilsonart: www.wilsonart.com.
 - 7) Substitutions: 01 25 00 - Substitution Procedures.
 - b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - c. NSF approved for food contact.
 - d. Sinks and Bowls: Separate units for undercounter mounting; minimum 3/4 inch wall thickness; comply with IAPMO Z124.
 - e. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
 - f. Color and Pattern: As selected by MBI Companies from manufacturer's standard line.
 - 3. Other Components Thickness: 1/2 inch, minimum.
 - 4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; radiused edge; use marine edge at sinks.
 - 5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
 - 6. Skirts: As indicated on drawings.
 - 7. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.

2.02 MATERIALS

- A. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
- B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- C. Joint Sealant: Mildew-resistant silicone sealant, white.

2.03 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - a. Rout a 1/8 inch drip groove at underside of exposed overlapping edges, set back 1/2 inch from face of edge.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.
- C. Wall-Mounted Counters: Provide brackets as indicated on drawings.

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 MBI Companies of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

- A. Clean countertops surfaces thoroughly.

3.06 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

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. Copper building wire rated 600 V or less.
 2. Metal-clad cable, Type MC, rated 600 V or less.
 3. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS

- A. RoHS: Restriction of Hazardous Substances.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated, and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Standards:
 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 2. RoHS compliant.
- C. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.
- D. Conductor Insulation:
 1. Type THHN and Type THWN-2: Comply with UL 83.

2.2 METAL-CLAD CABLE, TYPE MC

- A. Description: A factory assembly of one or more current-carrying insulated conductors in an overall metallic sheath.
- B. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. Comply with UL 1569.
- C. Circuits:
 - 1. Single circuit.
- D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.
- E. Ground Conductor: Insulated.
- F. Conductor Insulation:
 - 1. Type TFN/THHN/THWN-2: Comply with UL 83.
- G. Armor: Steel, interlocked.

2.3 FIRE-ALARM WIRE AND CABLE

- A. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.
- B. Signaling Line Circuits: Twisted, shielded pair, not less than No. 18 AWG recommended by system manufacturer.
- C. Non-Power-Limited Circuits: Solid-copper conductors with 600-V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.
 - 1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
 - 2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.

2.4 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

- C. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
 - 1. Material: Copper.
 - 2. Type: Two hole with standard barrels.
 - 3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. Power-Limited Fire Alarm and Control: Solid for No. 12 AWG and smaller.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN/THWN-2, single conductors in raceway.
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- C. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Metal-clad cable, Type MC.
- D. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 INSTALLATION OF FIRE-ALARM WIRING

- A. Comply with NECA 1 and NFPA 72.
- B. Wiring Method: Install wiring in metal pathway according to Section 270528.29 "Hangers and Supports for Communications Systems."
 - 1. Fire-alarm circuits and equipment control wiring associated with fire-alarm system shall be installed in a dedicated pathway system. This system shall not be used for any other wire or cable.
- C. Wiring Method:
 - 1. Cables and pathways used for fire-alarm circuits, and equipment control wiring associated with fire-alarm system, may not contain any other wire or cable.
 - 2. Fire-Rated Cables: Use of two-hour, fire-rated fire-alarm cables, NFPA 70, Types MI and CI, is not permitted.
- D. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with fire-alarm system to terminal blocks. Mark each terminal according to system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.
- E. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes; cabinets; or equipment enclosures where circuit connections are made.
- F. Color-Coding: Color-code fire-alarm conductors differently from the normal building power wiring. Use one color-code for alarm circuit wiring and another for supervisory circuits. Color-code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire-alarm system junction boxes and covers red.

3.5 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm) of slack.

3.6 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.7 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.8 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

END OF SECTION

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 grounding and bonding systems and equipment.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- 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. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 - 1. Stranded Conductors: ASTM B8.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper as indicated on drawings.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Grounding Conductors: Green-colored insulation with continuous yellow stripe.
- C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

1. Install bus horizontally, on insulated spacers 2 inches (50 mm) minimum from wall, 6 inches (150 mm) above finished floor unless otherwise indicated.

3.2 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Water Heater: Install a separate insulated equipment grounding conductor to each electric water heater. Bond conductor to heater units, piping, connected equipment, and components.

3.3 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

END OF SECTION

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. Steel slotted support systems.
2. Conduit and cable support devices.
3. Structural steel for fabricated supports and restraints.
4. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
5. Fabricated metal equipment support assemblies.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch- (10-mm-) diameter holes at a maximum of 8 inches (200 mm) o.c. in at least one surface.
 1. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
 2. Material for Channel, Fittings, and Accessories: Galvanized steel.
 3. Channel Width: Selected for applicable load criteria.
 4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-
- B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.
- D. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325 (Grade A325M).
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 1. NECA 1.
 2. NECA 101
- B. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.
- C. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."
- D. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch (6 mm) in diameter.
- E. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps.

F. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch (38-mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
6. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

D. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.

- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

END OF SECTION

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. Metal conduits and fittings.
2. Boxes, enclosures, and cabinets.
3. Nonmetallic conduits and fittings.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for firestopping at conduit and box entrances.

1.3 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

1. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. GRC: Comply with ANSI C80.1 and UL 6.
3. EMT: Comply with ANSI C80.3 and UL 797.
4. FMC: Comply with UL 1; zinc-coated steel.
5. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings:

1. Comply with NEMA FB 1 and UL 514B.
2. Listing and Labeling: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Fittings, General: Listed and labeled for type of conduit, location, and use.
4. Fittings for EMT:

- a. Material: Steel.
 - b. Type: Compression.
5. Expansion Fittings: steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
- C. Joint Compound GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

- A. Nonmetallic Conduit:
- 1. Listing and Labeling: Nonmetallic conduit shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
 - 3. LFNC: Comply with UL 1660.
- B. Nonmetallic Fittings:
- 1. Fittings, General: Listed and labeled for type of conduit, location, and use.
 - 2. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.
 - a. Fittings for LFNC: Comply with UL 514B.
 - 3. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- D. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
- E. Metal Floor Boxes:
- 1. Material: Cast metal or sheet metal].
 - 2. Type: Fully adjustable.
 - 3. Shape: Rectangular.

4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb (23 kg). Outlet boxes designed for attachment of luminaires weighing more than 50 lb (23 kg) shall be listed and marked for the maximum allowable weight.
- G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- H. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- I. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- J. Device Box Dimensions: 4 inches square by 2-1/8 inches deep (100 mm square by 60 mm deep) for quad mounting of devices or 4 inches by 2-1/8 inches by 2-1/8 inches deep (100 mm by 60 mm by 60 mm deep single device mounting).
- K. Gangable boxes are prohibited.
- L. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- M. Cabinets:
 1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 2. Hinged door in front cover with flush latch and concealed hinge.
 3. Key latch to match panelboards.
 4. Metal barriers to separate wiring of different systems and voltage.
 5. Accessory feet where required for freestanding equipment.
 6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
 1. Exposed Conduit: GRC.
 2. Concealed Conduit, Aboveground: GRC.
 3. Underground Conduit: RNC, Type Schedule 80 PVC direct buried, concrete encased under paved areas.

4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed, Not Subject to Physical Damage: EMT.
 2. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
 - a. Corridors and rooms used for traffic of mechanized carts, tractors, mowers, forklifts, and pallet-handling units.
 3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 5. Damp or Wet Locations: GRC.
 6. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250.
- C. Minimum Raceway Size: 3/4-inch (16-mm) trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. EMT: Use compression, steel fittings. Comply with NEMA FB 2.10.
 3. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

3.2 INSTALLATION

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.
- D. Do not fasten conduits onto the bottom side of a metal deck roof.
- E. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- F. Complete raceway installation before starting conductor installation.
- G. Arrange stub-ups so curved portions of bends are not visible above finished slab.

- H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.
- I. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- J. Support conduit within 12 inches (300 mm) of enclosures to which attached.
- K. Stub-Ups to Above Recessed Ceilings:
 - 1. Use EMT for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- L. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- M. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.
- N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- O. Cut conduit perpendicular to the length. For conduits 2-inch (53-mm) trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- Q. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- R. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Conduit extending from interior to exterior of building.
 - 4. Where otherwise required by NFPA 70.
- S. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 36 inches (915 mm) of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
- T. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- U. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- V. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- W. Locate boxes so that cover or plate will not span different building finishes.
- X. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- Y. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- Z. Set metal floor boxes level and flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:
 1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches (150 mm) in nominal diameter.
 2. Install backfill as specified in Section 312000 "Earth Moving."
 3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches (300 mm) of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
 4. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose.

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.5 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.6 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

END OF SECTION

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. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A53/A53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch (0.6-mm) minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

- C. PVC-Pipe Sleeves: ASTM D1785, Schedule 40.

- D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

- E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

F. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and with no side larger than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
 - b. For sleeve cross-section rectangle perimeter 50 inches (1270 mm) or more and one or more sides larger than 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
1. Sealing Elements: EPDM rubber 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.
 3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.

2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
 - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
 - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION

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. Color for conductors, and warning labels and signs.
 - 2. Signs.
 - 3. Fasteners for labels and signs.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with NFPA 70.
- B. Comply with NFPA 70E requirements for arc-flash warning labels.
- C. Comply with ASME A13.1.
- D. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- E. Comply with ANSI Z535.4 for safety signs and labels.

2.2 COLOR AND LEGEND REQUIREMENTS

- A. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.
 - 1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
 - 2. Colors for 208/120-V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.

3. Color for Neutral: White.
4. Color for Equipment Grounds: Green.

B. Equipment Identification Labels:

1. Black letters on a white field.

C. Warning labels and signs shall include, but are not limited to, the following legends:

1. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.3 SIGNS

A. Baked-Enamel Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch (6.4-mm) grommets in corners for mounting.
3. Nominal Size: 7 by 10 inches (180 by 250 mm).

B. Metal-Backed Butyrate Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch (1-mm) galvanized-steel backing, punched and drilled for fasteners, and with colors, legend, and size required for application.
2. 1/4-inch (6.4-mm) grommets in corners for mounting.
3. Nominal Size: 10 by 14 inches (250 by 360 mm).

C. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.
2. Thickness:
 - a. For signs up to 20 sq. in. (129 sq. cm), minimum 1/16 inch (1.6 mm) thick.
 - b. For signs larger than 20 sq. in. (129 sq. cm), 1/8 inch (3.2 mm) thick.
 - c. Engraved legend with black letters on white face.
 - d. Punched or drilled for mechanical fasteners with 1/4-inch (6.4-mm) grommets in corners for mounting.
 - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.4 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 Deg F (23 Deg C) according to ASTM D638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black, except where used for color-coding.

2.5 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Verify identity of each item before installing identification products.
- C. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- D. Apply identification devices to surfaces that require finish after completing finish work.
- E. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- F. Baked-Enamel Signs:
 - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
 - 2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on minimum 1-1/2-inch- (38-mm-) high sign; where two lines of text are required, use signs minimum 2 inches (50 mm) high.
- G. Metal-Backed Butyrate Signs:
 - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
 - 2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high sign; where two lines of text are required, use labels 2 inches (50 mm) high.
- H. Laminated Acrylic or Melamine Plastic Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch- (13-mm-) high letters on 1-1/2-inch- (38-mm-) high sign; where two lines of text are required, use labels 2 inches (50 mm) high.

I. Cable Ties: General purpose, for attaching tags, except as listed below:

3.3 IDENTIFICATION SCHEDULE

A. Arc Flash Warning Labeling: Self-adhesive labels.

B. Equipment Identification Labels:

1. Indoor Equipment: Baked-enamel signs.
2. Outdoor Equipment: Laminated acrylic or melamine sign 4 inches (100 mm) high.
3. Equipment to Be Labeled:

- a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of a engraved, laminated acrylic or melamine label.
- b. Enclosures and electrical cabinets.
- c. Access doors and panels for concealed electrical items.

C. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.

END OF SECTION

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. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.

1.3 DEFINITIONS

- A. ATS: Acceptance testing specification.
- B. GFCI: Ground-fault circuit interrupter.
- C. HID: High-intensity discharge.
- D. MCCB: Molded-case circuit breaker.
- E. SPD: Surge protective device.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of panelboard.
 - 1. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.
 - 2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details.
 - 2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
 - 3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
 - 4. Detail bus configuration, current, and voltage ratings.
 - 5. Short-circuit current rating of panelboards and overcurrent protective devices.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Remove loose packing and flammable materials from inside panelboards.
- B. Handle and prepare panelboards for installation according to NECA 407.

1.6 FIELD CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - 2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding minus 22 deg F (minus 30 deg C) to plus 104 deg F (plus 40 deg C).
 - b. Altitude: Not exceeding 6600 feet (2000 m).

1.7 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.
 - 1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS COMMON REQUIREMENTS

- 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. Comply with NEMA PB 1.
- C. Comply with NFPA 70.
- D. Enclosures: Flush or Surface as indicated-mounted, dead-front cabinets.
 - 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 3R.
 - 2. Height: 84 inches (2.13 m) maximum.

3. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims shall cover all live parts and shall have no exposed hardware.
 4. Finishes:
 - a. Panels and Trim: Steel and galvanized steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel
- E. Incoming Mains:
1. Location: Top or Bottom as indicated.
- F. Phase, Neutral, and Ground Buses:
1. Material: Hard-drawn copper, 98 percent conductivity.
 - a. Plating shall run entire length of bus.
 - b. Bus shall be fully rated the entire length.
 2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
 3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
 4. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.
- G. Conductor Connectors: Suitable for use with conductor material and sizes.
1. Material: Hard-drawn copper, 98 percent conductivity.
 2. Terminations shall allow use of 75 deg C rated conductors without derating.
 3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
 4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.
 5. Ground Lugs and Bus-Configured Terminators: Compression type, with a lug on the bar for each pole in the panelboard.
- H. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.
1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
 2. Panelboards and overcurrent protective devices rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

2.2 POWER PANELBOARDS

- A. Panelboards: NEMA PB 1, distribution type.
- B. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
 - 1. For doors more than 36 inches (914 mm) high, provide two latches, keyed alike.
- C. Mains: Circuit breaker or Lugs only as indicated.
- D. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
- E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- B. Mains: Circuit breaker or lugs only as indicated.
- C. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- D. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.
- E. Doors: Door-in-door construction with concealed hinges; secured with multipoint latch with tumbler lock; keyed alike. Outer door shall permit full access to the panel interior. Inner door shall permit access to breaker operating handles and labeling, but current carrying terminals and bus shall remain concealed.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers:
 - a. Inverse time-current element for low-level overloads.
 - b. Instantaneous magnetic trip element for short circuits.
 - c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 2. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
 - 3. MCCB Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Breaker handle indicates tripped status.
 - c. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.

- d. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and HID lighting circuits.
- e. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
- f. Multipole units enclosed in a single housing with a single handle.

2.5 IDENTIFICATION

- A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.
- B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.
- C. Circuit Directory: Computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.
 - 1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.
- B. Receive, inspect, handle, and store panelboards according to NECA 407.
- C. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.
- D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Comply with NECA 1.

- C. Install panelboards and accessories according to NECA 407.
- D. Equipment Mounting:
 - 1. Attach panelboard to the vertical finished or structural surface behind the panelboard.
- E. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.
- F. Mount top of trim 90 inches (2286 mm) above finished floor unless otherwise indicated. Distance to highest breaker shall not exceed 6'7" from finished floor.
- G. Mount panelboard cabinet plumb and rigid without distortion of box.
- H. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- I. Mount surface-mounted panelboards to steel slotted supports 5/8 inch (16 mm) in depth. Orient steel slotted supports vertically.
- J. Install overcurrent protective devices and controllers not already factory installed.
 - 1. Set field-adjustable, circuit-breaker trip ranges.
 - 2. Tighten bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written instructions.
- K. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.
- L. Install filler plates in unused spaces.

3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.
- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

C. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test for low-voltage air circuit breakers stated in NETA ATS, Paragraph 7.6 Circuit Breakers. Do not perform optional tests. Certify compliance with test parameters
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

D. Panelboards will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results, with comparisons of the two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

3.6 PROTECTION

- A. Temporary Heating: Prior to energizing panelboards, apply temporary heat to maintain temperature according to manufacturer's written instructions.

END OF SECTION

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. Standard-grade receptacles, 125 V, 20 A.
 2. GFCI receptacles, 125 V, 20 A.
 3. Toggle switches, 120/277 V, 20 A.
 4. Occupancy sensors.
 5. Wall plates.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Comply with NFPA 70.
- C. RoHS compliant.
- D. Comply with NEMA WD 1.
- E. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.

F. Wall Plate Color: For plastic covers, match device color.

G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 STANDARD-GRADE RECEPTACLES, 125 V, 20 A

A. Duplex Receptacles, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.

B. Tamper-Resistant Duplex Receptacles, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498 and FS W-C-596.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

C. Weather-Resistant Duplex Receptacle, 125 V, 20 A :

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

D. Tamper- and Weather-Resistant Duplex Receptacles, 125 V, 20 A:

1. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Standards: Comply with UL 498.
4. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.3 GFCI RECEPTACLES, 125 V, 20 A

A. Duplex GFCI Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

B. Tamper-Resistant Duplex GFCI Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
2. Configuration: NEMA WD 6, Configuration 5-20R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" Article.

C. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V, 20 A:

1. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
2. Configuration: NEMA WD 6, Configuration 5-15R.
3. Type: Non-feed through.
4. Standards: Comply with UL 498 and UL 943 Class A.
5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.4 OCCUPANCY SENSORS

A. Wall Switch Sensor Light Switch, Dual Technology:

1. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual (ultrasonic and passive infrared) technology.
2. Standards: Comply with UL 20.
3. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
4. Adjustable time delay of 15 minutes.
5. Able to be locked to Manual-On mode.
6. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc (21.5 to 2152 lux).

2.5 SWITCHES

A. TOGGLE TYPE

1. Switches shall be toggle, quiet-type with totally enclosed bodies of thermoplastic and mounting strap.
2. Rated for 20A, 277 volts AC. Specification grade.

2.6 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.

B. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for finished and unfinished Spaces: 0.035-inch- (1-mm-) thick, satin-finished, Type 302 stainless steel.

- C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
 - 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes, and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 - 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 - 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 3. The length of free conductors at outlets for devices shall comply with NFPA 70, Article 300, without pigtails.
 - 4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
- D. Device Installation:
 - 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 - 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 - 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 - 4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
 - 5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
 - 6. Use a torque screwdriver when a torque is recommended or required by manufacturer.

7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

H. Adjust locations of floor service outlets to suit arrangement of furnishings.

3.2 FIELD QUALITY CONTROL

A. Test Instruments: Use instruments that comply with UL 1436.

B. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

C. Tests for Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault-current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

D. Wiring device will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

END OF SECTION

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. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Molded-case circuit breakers (MCCBs).
 - 4. Enclosures.

1.3 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
 - 1. Enclosure types and details for types other than NEMA 250, Type 1.
 - 2. Current and voltage ratings.
 - 3. Short-circuit current ratings (interrupting and withstand, as appropriate).
 - 4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
 - 5. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF electronic format.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:

1. Ambient Temperature: Not less than minus 22 deg F (minus 30 deg C) and not exceeding 104 deg F (40 deg C).
2. Altitude: Not exceeding 6600 feet (2010 m).

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.
 1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
- C. Comply with NFPA 70.

2.2 FUSIBLE SWITCHES

- A. Type HD, Heavy Duty:
 1. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses.
 2. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- B. Accessories:
 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 2. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 3. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.3 NONFUSIBLE SWITCHES

- A. Type HD, Heavy Duty, Three Pole, Single Throw, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- B. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground
2. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.

2.4 MOLDED-CASE CIRCUIT BREAKERS

- A. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.
- B. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.
- C. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be 100 percent rated.
- D. MCCBs shall be equipped with a device for locking in the isolated position.
- E. Lugs shall be suitable for 140 deg F (60 deg C) rated wire on 125-A circuit breakers and below.
- F. Standard: Comply with UL 489 with interrupting capacity to comply with available fault currents.
- G. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
- H. Features and Accessories:
 1. Standard frame sizes, trip ratings, and number of poles.
 2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
 3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.

2.5 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
- B. Enclosure Finish: The enclosure shall be gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1).

- C. **Operating Mechanism:** The circuit-breaker operating handle shall be externally operable with the operating mechanism being an integral part of the box, not the cover. The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Commencement of work shall indicate Installer's acceptance of the areas and conditions as satisfactory.

3.2 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

- A. **Enclosed Switches and Circuit Breakers:** Provide enclosures at installed locations with the following environmental ratings.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Type 3R.
 - 3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
 - 4. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

3.3 INSTALLATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- C. Install fuses in fusible devices.
- D. Comply with NFPA 70 and NECA 1.

3.4 IDENTIFICATION

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

- A. Perform tests and inspections.

- B. Tests and Inspections for Switches:

- 1. Visual and Mechanical Inspection:

- a. Inspect physical and mechanical condition.
- b. Inspect anchorage, alignment, grounding, and clearances.
- c. Verify that the unit is clean.
- d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
- e. Verify that fuse sizes and types match the Specifications and Drawings.
- f. Verify that each fuse has adequate mechanical support and contact integrity.
- g. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
- h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
- i. Verify correct phase barrier installation.
- j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

- C. Tests and Inspections for Molded Case Circuit Breakers:

- 1. Visual and Mechanical Inspection:

- a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
- b. Inspect physical and mechanical condition.
- c. Inspect anchorage, alignment, grounding, and clearances.

- d. Verify that the unit is clean.
 - e. Operate the circuit breaker to ensure smooth operation.
 - f. Inspect bolted electrical connections for high resistance using one of the two following methods:
 - 1) Use a low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.
 - g. Inspect operating mechanism, contacts, and chutes in unsealed units.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

3.6 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

- A. If testing proves that system is required; furnish, install, and test a complete and operating Emergency Responder Radio Antenna/Repeater System. The system will support only the Fire Department radio system and no others. Provisions for supporting other public safety systems (e.g. police); cell phone carriers.
- B. This Section includes the requirements for an Emergency Responder Radio Antenna/Repeater System for the purposes of amplifying Emergency Responder radio signals to achieve minimum signal strength in 95% of all areas on each floor of the building.
- C. Final acceptance and approval is required from the local Fire Department in writing prior to contract closeout.
- D. Section Includes:
 - 1. Bi-directional amplifiers (BDA's)
 - 2. Distributed Antenna System (DAS)
 - 3. Coaxial cables
 - 4. Splitters and direction couplers
 - 5. UPS
 - 6. All other equipment and components necessary for a complete and functioning Emergency Responder Radio Antenna/Repeater System.

1.02 REGULATIONS

- A. Codes, regulations, and standards referenced in the Section are:
 - 1. NFPA 1 – The National Fire Code
 - 2. NFPA 70 – The National Electrical Code
 - 3. NFPA 101, Life Safety Code, and Local Code and Building Authority requirements.
 - 4. NFPA 72 National Fire Alarm Code
 - 5. FCC 47 CFR Private Land Mobile Radio
 - a. 90.219-2007 Services-Use of Signal Boosters
 - 6. International Fire Code, Code and Commentary
 - 7. ADA "Americans with Disabilities Act"
 - 8. FCC's OET 65 Standards "Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields".
 - 9. FCC Rules Part 22, Part 90 and Part 101.

1.03 DEFINITIONS

- A. Definitions:
 - 1. Bi-Directional Amplifier (BDA): Device used to amplify band-selective or multi-band RF signals in the uplink, to the base station for enhanced signals and improved coverage.
 - 2. Emergency Responder Radio Coverage System (ERRCS): A two-way radio communication system installed to assure the effective operation of radio communications systems for fire, emergency medical services or law enforcement agencies within a building or structure. A system used by firefighters, police, and other emergency services personnel.
 - 3. Delivered Audio Quality Definitions (DAQ): This is a universal standard often cited in system designs and specifications.
 - a. DAQ 1: Unusable, speech present but unreadable.
 - b. DAQ 2: Understandable with considerable effort. Frequent repetition due to noise/distortion.
 - c. DAQ 3: Speech understandable with slight effort. Occasional repetition required due to noise/distortion.

- d. DAQ 3.5: Speech understandable with repetition only rarely required. Some noise/distortion
- e. DAQ 4: Speech easily understood. Occasional noise/distortion.
- f. DAQ 4.5: Speech easily understood. Infrequent noise/distortion.
- g. DAQ 5: Speech easily understood. Coupled Bonding Conductor (CBC) – The term "Coupled Bonding Conductor" shall mean a bonding conductor placed, e.g. strapped, on the outside of any technology cable, used to suppress transient noise.
- 4. FCC: Federal Communications Commission
- 5. OET 65 Standards: FCC's Bulletin 65 provides Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.
- 6. Public Safety/First Responder: Public Safety or First Responder agencies which are charged with the responsibility of responding to emergency situations. These include, but are not limited to: law enforcement departments, fire departments, and emergency medical companies.

1.04 SUBMITTALS

- A. Submit product data for each type of proposed system component specified, including dimensioned drawings showing minimum clearances and installed features.
- B. Layout Drawings
 - 1. Component specification sheets shall be 8.5 inch x 11 inch or greater, scaled or dimensioned, with dimensions or scale clearly noted.
 - 2. Floor plan drawings shall be 24 inch x 36 inch minimum with drawings scaled to legible size.
 - 3. Floor plan drawings may include elevation detail names for each elevation view. Sheet title shall include site name, address, sheet number, floor plan number and north arrow. Include site plan view of the subject buildings and surrounding property to clearly indicate the location and orientation of roof mounted outdoor antennas associated with the proposed system.
 - 4. Include a minimum of (1) building elevation depicting the location of any outdoor antennas associated with the proposed system. Include height of antenna centerline above building, orientation, and location of all external grounding connections.
 - 5. Include a detail plan view of all Telecommunications Spaces housing head-end and/or other consolidated equipment, showing the location of the rack(s) and/or enclosure(s) of the Emergency Responder Radio Antenna/Repeater System equipment.
 - 6. Include a separate plan view of each interior floor where indoor antenna systems are proposed. Include antenna numbers, coaxial cable routes, and the locations of any other system components including splitters, couplers, filters, amplifiers, etc. All components shall be named or labeled for reference in power budget calculations tables. Overlay approximated coverage radii indicating -95 dBm downlink (base to mobile) signal strength around each proposed indoor coverage antenna. Include results of any previous coverage testing per grid, if available.
 - 7. Include a minimum of one (1) detail elevation view(s) of all rack(s) and/or enclosure(s) housing the Emergency Responder Radio Antenna/Repeater System equipment. Identify each piece of equipment by brand, model number and equipment type.
 - 8. Specify antenna grounding and surge protection in accordance with NEC Article 810.
 - 9. Specify the backup power source (Life Safety), and include calculations to ensure the backup power requirements as specified in this standard are met.
- C. Equipment Specification Sheets
 - 1. Provide copies of manufacturer specification sheets of all system components, including:
 - a. Amplifiers
 - b. Antennas
 - c. Coaxial cable, couplers, splitters, combiners, or other passive components
 - 2. Operation and maintenance data

- 3. Pass band curves in for the uplink and downlink portions of the NPSAC band for any amplifiers, if not included in #1. Amplifiers may NOT amplify portions of other licensed services, including Nextel and Specialized Mobile Radio Licensee band, or Cellular A or B bands.
 - 4. Backup battery and charging system.
- D. Submit wiring diagrams from manufacturer differentiating clearly between factory and field-installed wiring. Include diagrams for each component of the system with all terminals and interconnections identified. Make all diagrams specific to this Project.
 - E. Submit product certificates signed by the manufacturer of radio system components certifying that their products comply with specified requirements.
 - F. Submit agenda for training class and copies of all handouts for the class.
 - G. Maintenance data for radio system shall be included in the operation and maintenance manual. Include data for each type of product, including all features and operating sequences, both automatic and manual. Provide the names, addresses, and telephone numbers of service organizations that carry stock of repair parts for the system to be furnished.
 - H. Record of field tests of the radio system shall be included in the operation and maintenance manuals.
 - I. Design Approval: Plans shall be submitted and approved prior to installation. The following information shall be provided to the local Fire Department unit representative by the system designer/Contractor:
 - 1. A minimum of three (3) copies of detailed drawings showing the location of the amplification equipment and associated antenna systems which includes a view showing building access to the equipment; and
 - 2. A minimum of three (3) copies of schematic drawings of the electrical system, backup power, antenna system and any other associated equipment relative to the amplification equipment including panel locations and labeling.
 - 3. A minimum of one (1) copy of the Manufacturer's data sheets on all equipment to be installed.
- 1.05 QUALITY ASSURANCE
- A. Installer Qualifications: Engage an experienced factory-authorized installer to perform work of this Section.
 - B. Single-Source Responsibility: Obtain radio system components from a single source who assumes responsibility for compatibility of system components.
 - C. All equipment shall be UL listed and labeled, and in accordance with applicable NEMA and ANSI Standards. Where copper cabling is routed to an area, either in another building, or with a separate electrical service, the Technology Contractor shall provide primary protective equipment.
 - D. All racks and enclosures shall be either welded or assembled with paint piercing ground washers, grounding strip and bonding jumper as indicated on the Drawings.

PART 2 PRODUCTS

2.01 GENERAL PERFORMANCE REQUIREMENTS

- A. Compatibility: The equipment, including but not limited to repeaters, transmitters, receivers, signal boosters, cabling, fiber distributed antenna system, etc., shall not interfere with the existing communication systems utilized by the Public Safety and First Responder agencies.

- B. Power Supplies: At least two (2) independent and reliable power supplies shall be provided, one primary and one secondary. The primary power source shall be supplied from a dedicated 20 ampere branch circuit and comply with 4.4.1.4 of NFPA 72. The secondary power source shall be a dedicated battery, capable of operating the in-building radio system for at least 12 hours of 100% system operation. The battery system shall automatically charge in the presence of external power input. The battery system shall be contained in one NEMA 4 or 4X type enclosures. Monitoring the integrity of power supplies shall be in accordance with 4.4.7.3 of NFPA 72.
- C. Survivability
 - 1. Physical Protection: All wiring and fiber optics shall be installed in conduit.
 - 2. Fire Performance: All main risers or trunks of the antenna system shall be installed with resistance to attack from a fire using one of the following methods:
 - a. A 2-hour fire rated cable or cable system.
 - b. Routing the cable through a 2-hour fire rated enclosure(s) or shaft(s).
 - c. A system configured in a looped design, routed through 1-hour fire rated enclosure(s) or shaft(s). The circuit shall be capable of transmitting and receiving a signal during a single open or non-simultaneous single ground fault on a circuit conductor.
 - d. Performance alternative approved by the authority having jurisdiction.
 - 3. Cabinet: The signal booster and all associated RF filters shall be housed in a single, NEMA 4 certified, painted steel weather tight box. The cabinet shall be large enough to dissipate internal heat without venting the inside of the cabinet to the outside atmosphere. Operating temperatures: – 22 degrees F to +120 degrees F (–30 degrees C to +50 degrees C) minimum temperature range, including microprocessors. Equipment installed on the roof of structures shall be rated for the expected extreme temperatures associated with rooftop installations.
 - 4. Passive Equipment: Passband shall be 700-900 MHz, IP rating of 2 GHz.
 - 5. Cable: Passband shall be 700-900 MHz. Cable shall be rated for fire plenum and riser rating.

2.02 SYSTEM COMPONENTS

- A. Signal Strength
 - 1. Downlink: A minimum signal strength of -95 dBm shall be provided throughout the coverage area.
 - 2. Uplink: Minimum signal strength of -95 dBm received at the local Fire Department Radio System from the coverage area.
 - 3. A donor antenna must maintain isolation from the distributed antenna system. The donor antenna signal level shall be a minimum of 15 dB above the distributed antenna system under all operating conditions.
- B. Permissible Systems
 - 1. Buildings and structures shall be equipped with an FCC Certificated Class B Bi-Directional UHF Amplifier(s) as needed.
 - 2. The distributed antenna system may utilize a radiating cable, fixed antennas, or a combination of both.
- C. Supported Frequencies: The radio system shall support frequencies in the 700 and 800 MHz public safety bands as utilized by the local Fire Department.
- D. Reject Filters: Notch filter sections shall be incorporated to minimize adjacent channel cellular and SMR (Nextel) degradation of the signal booster performance. The minimum downlink band adjacent band rejection shall be 35 dB or greater at 865 MHz and 870 MHz.
- E. Band Migration Capability: The signal booster shall include re-tunable or replaceable filters to accommodate rapid and economic passband changes in the event of mandatory FCC changes within the NPSPAC band. The use of non-adjustable and non-replaceable RF input and output filters is prohibited.

- F. Output Level Control: An automatic output leveling circuit shall be included for both passbands with a minimum dynamic range of 60 dB, less any gain reduction setting, to maintain FCC out of band and spurious emission compliance.
- G. Degraded Performance in Emergencies: The system shall be designed to allow degraded performance in adverse conditions, such as abnormally high temperatures resulting from nearby fires, extreme voltage fluctuations or other abnormal conditions that may occur during an emergency. Circuits that intentionally disable the signal booster in such situations (i.e. under/over voltage, over/under current, over/under temperature, etc.) will not be implemented as the standard mode for public safety applications.
- H. Mode of Operation: The system shall be normally powered on and shall continuously provide passing of frequencies within the Public Safety and First Responder bands.
- I. All in-building radio systems shall be compatible with both analog and digital communications simultaneously at the time of installation.

2.03 SYSTEM MONITORING

- A. The distributed antenna system shall include a connection to the fire alarm system to monitor the integrity of the circuit of the signal booster(s) and power supplies and annunciate this malfunction on the fire alarm system shall comply with 4.4.7.1 of NFPA 72.
- B. A sign shall be located at the fire alarm panel with the name and telephone number of the local Fire Department indicating that they shall be notified of any failures that extend past the 2 hour time limit.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Distribution System Signal Wires and Cables
 1. Wires and cables shall enter each equipment enclosure, console, cabinet or rack in such a manner that all doors or access panels can be opened and closed without removal or disruption of the cables.
 2. Routing and Interconnection
 - a. Wires or cables routed between consoles, cabinets, racks, and other equipment shall be installed in an approved conduit or cable tray that is secured to building structure.
 - b. Completely test all of the cables after installation and replace any that are found to be defective.
 3. Install cables without damaging conductors, shield, or jacket.
 4. Do not bend cables, while handling or installing, to radii smaller than as recommended by manufacturer.
 5. Pull cables without exceeding cable manufacturer's recommended pulling tensions.
- B. Product Delivery, Storage, and Handling
 1. Delivery: Deliver materials to the job site in OEM's original unopened containers, clearly labeled with the OEM's name and equipment model and serial identification numbers.
 2. Store and protect equipment in a conditioned space until installation.
- C. System Installation
 1. Coaxial antenna cabling shall not be installed in the same conduit, raceway, or cable trays used for other systems.
 2. All equipment shall be connected according to the OEM's specifications to insure correct installation and system performance.
 3. Coordinate all roof penetrations with Owner and/or roofing contractor.

3.02 LICENSING

- A. All fees associated with the licensing shall be paid by the Owner.
- B. All testing must be done on frequencies authorized by the FCC.

3.03 GROUNDING

- A. Ground cable shields and equipment per Manufacturer's requirements.
- B. Antenna mast shall be grounded per NFPA 70 NEC requirements and antenna manufacturer's requirements. Provide grounding blocks and surge protection for outside coaxial cabling. Bond the antenna mast to the existing lightning protection system if available.

3.04 APPROVAL TESTING

- A. The local Fire Department will review plans and specifications. Upon acceptance, plans will be stamped to indicate approval. Stamped plans are required to be present at the acceptance test. Any field changes that occur during construction shall be incorporated into new As-Built plans, including any manufacturer's data sheets for any equipment changes not submitted in the original submittal. As-Built plans, if required due to system changes, shall be submitted to the local Fire Department for approval.
- B. Tests shall be made using frequencies close to the frequencies used by the Fire Department and appropriate emergency services. If testing is done on the actual frequencies, then this testing must be coordinated with the local Fire Department unit. All testing must be done on frequencies authorized by the FCC. A valid FCC license will be required if testing is done on frequencies different from the police, fire or emergency medical frequencies.
- C. Testing Procedures
 - 1. Minimum Signal Strength: For testing system signal strength and quality, the testing shall be based on the delivered audio quality (DAQ) system. A DAQ level below 3.0 shall be considered a failed test for a given grid cell.
 - 2. Measurements shall be made with the antenna held in a vertical position at 3 to 4 feet above the floor to simulate a typical portable radio worn on the belt or turnout coat pocket.
- D. Final Acceptance Testing
 - 1. All acceptance testing shall be done in the presence of a local Fire Department representative or by the local Fire Department unit at no expense to the City.
 - 2. Small scale drawings (11 inch x 17 inch maximum) of the structure shall be provided by the Contractor to the Owner. The plans shall show each floor divided into the grids as described above, and the results of the pre-testing. Each grid shall be labeled to indicate the DAQ result from the final acceptance testing.
 - 3. The Contractor shall provide the latest approved plans for the system, including any manufacture's data sheets for any equipment changes not submitted in the original submittal to the Owner.
 - 4. Include testing results of the repeater (output wattage, gain level, etc) and connection to the fire alarm.

3.05 MAINTENANCE AND ANNUAL TESTING

- A. Annual tests will be conducted by the local Fire Department unit or authorized company.
 - 1. The re-testing will be done at no expense to the City or the appropriate emergency services departments as required in the original testing procedures.
- B. Maintenance Contract
 - 1. Maintenance contract with a Radio Service Provider in place with name of authorized company, who will provide a 24 hour by 7 day emergency response within two (2) hours after notification.

- The system shall be maintained in accordance with FCC requirements. The contract shall be for 5 years.
2. All tests shall be conducted, documented, and signed by a person in possession of a current FCC General Radio telephone Operator License, or a technician certification issued by the Association of Public-Safety Communications Officials International (APCO) or equivalent as determined by the local Fire Department.
 3. Maintain a list of contact personnel with phone numbers at the radio repeater system cabinet. The contact personnel shall have knowledge of the building and the repeater system and be available to respond to the building in the case of an emergency.
 4. Radio Service Provider maintenance contract shall include but not limited to:
 - a. Annual Test
 - 1) All active components of the distributed antenna system, including but not limited to amplifier, power supplies, and back-up batteries, shall be tested a minimum of once every 12 months.
 - 2) Amplifiers shall be tested to ensure that the gain is the same as it was upon initial installation and acceptance. The original gain shall be noted and any change in gain shall be documented.
 - 3) Back-up batteries and power supplies shall be tested under load for a period of 1 hour to verify that they will operate during an actual power outage.
 - 4) Active components shall be checked to determine that they are operating within the manufacturer's specifications for their intended purpose.
 - 5) Documentation of the test shall be maintained on site and a copy forwarded to the local Fire Department Radio Supervisor upon completion of the test.
 5. Fire Department Radio personnel, after providing reasonable notice to the Owner or their representative, shall have the right to enter onto the property to conduct field testing to be certain that the required level of radio coverage is present.

END OF SECTION

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. Fire-alarm control unit.
 2. Manual fire-alarm boxes.
 3. System smoke detectors.
 4. Heat detectors.
 5. Notification appliances.
 6. Device guards.
 7. Addressable interface device.
 8. Cellular alarm communicator transmitter.
 9. Network communications.

1.3 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. FACP: Fire Alarm Control Panel.
- C. HLI: High Level Interface.
- D. NICET: National Institute for Certification in Engineering Technologies.
- E. PC: Personal computer.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.
 1. Include construction details, material descriptions, dimensions, profiles, and finishes.
 2. Include rated capacities, operating characteristics, and electrical characteristics.
- B. Shop Drawings: For fire-alarm system.
 1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 2. Include annunciators, fire alarm controls panel, transponders, and notification power supplies on floor plans.

3. Manufacturer's data sheets indicating model numbers and listing information for equipment, devices, and materials.
4. Include plans, elevations, sections, details, and attachments to other work.
5. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate power connections, conductor types and sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
6. Detail assembly and support requirements.
7. Include voltage drop calculations for notification-appliance circuits.
8. Include battery-size calculations.
9. Include power connection.
10. Include input/output matrix.
11. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
12. Include performance parameters and installation details for each detector.
13. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
14. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams. Include details of ceiling height and construction.
15. Include a floor plan that indicates the use of all rooms.
16. Include locations of alarm-initiating devices and alarm notification appliances including candela ratings for visible alarm notification appliances on floor plans.
17. Include information on the interface of fire safety control functions.

C. General Submittal Requirements:

1. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. NICET-certified, fire-alarm technician; Level IV minimum.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
 - 1. Include the following:
 - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
 - d. Riser diagram.
 - e. Device addresses.
 - f. Record copy of site-specific software.
 - g. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
 - 1) Equipment tested.
 - 2) Frequency of testing of installed components.
 - 3) Frequency of inspection of installed components.
 - 4) Requirements and recommendations related to results of maintenance.
 - 5) Manufacturer's user training manuals.
 - h. Manufacturer's required maintenance related to system warranty requirements.
 - i. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

1.7 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. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
 - 2. Smoke Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than one unit of each type.
 - 3. Detector Bases: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
 - 4. Keys and Tools: One extra set for access to locked or tamperproofed components.
 - 5. Audible and Visual Notification Appliances: One of each type installed.
 - 6. Fuses: Two of each type installed in the system. Provide in a box or cabinet with compartments marked with fuse types and sizes.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level IV technician.
- B. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).
- C. Fire alarm contractor must be certified in accordance with the Tennessee Alarm Contractors Licensing Act of 1991, TCA Title 62, Chapter 32, Part 3 “Alarm Contractors Licensing Act.”, available at: <http://www.lexisnexis.com/hottopics/tncode/>.

1.9 PROJECT CONDITIONS

- A. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless approval has been obtained from owner and fire watch is provided per paragraph 1.10A of this specification section.
- B. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.

1.10 SEQUENCING AND SCHEDULING

- A. Existing Fire-Alarm Equipment: Provide fire watch as required by the Authority Having Jurisdiction if the existing fire alarm system becomes disabled. Coordinate schedule of work and outages with Owner.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Noncoded, UL-certified addressable system, with multiplexed signal transmission and voice/strobe evacuation.
- B. Automatic sensitivity control of certain smoke detectors.
- C. All components provided shall be listed for use with the selected system.
- D. 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.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices:
 - 1. Manual stations.
 - 2. Heat detectors.
 - 3. Smoke detectors.
 - 4. Duct smoke detectors.
 - 5. Automatic sprinkler system water flow.
 - 6. Existing building fire alarm system signal

- B. Fire-alarm signal shall initiate the following actions:
 - 1. Continuously operate alarm notification appliances, including voice evacuation notices.
 - 2. Identify alarm and specific initiating device at fire-alarm control unit and connected network control panels.
 - 3. Transmit an alarm signal to the remote alarm receiving station.
 - 4. Release fire and smoke doors held open by magnetic door holders.
 - 5. Activate voice/alarm communication system.
 - 6. Record events in the system memory.
 - 7. Send signal to existing building fire alarm system to go into alarm.

- C. Supervisory signal initiation shall be by one or more of the following devices and actions:
 - 1. Loss of communication with any panel on the network.
 - 2. Valve supervisory switch

- D. System trouble signal initiation shall be by one or more of the following devices and actions:
 - 1. Open circuits, shorts, and grounds in designated circuits.
 - 2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
 - 3. Loss of communication with any addressable sensor, input module, relay, control module, remote annunciator, or Ethernet module.
 - 4. Loss of primary power at fire-alarm control unit.
 - 5. Ground or a single break in internal circuits of fire-alarm control unit.
 - 6. Abnormal ac voltage at fire-alarm control unit.
 - 7. Break in standby battery circuitry.
 - 8. Failure of battery charging.
 - 9. Abnormal position of any switch at fire-alarm control unit or annunciator.
 - 10. Voice signal amplifier failure.

11. Trouble on existing FACP.

E. System Supervisory Signal Actions:

1. Initiate supervisory service audible signal and illuminate the LED at the control unit and remote annunciator.
2. Identify specific device initiating the event at fire-alarm control unit and connected network control panels.
3. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.

F. Trouble Signal Actions:

1. Send trouble signal to existing building fire alarm system.

2.3 FIRE-ALARM CONTROL UNIT

A. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
 - a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
 - b. Include a real-time clock for time annotation of events on the event recorder.
 - c. Provide communication between the FACP and remote circuit interface panels, annunciators, and displays.
 - d. The FACP shall be listed for connection to a central-station signaling system service.
 - e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 500-event history log.
2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.
4. The fire alarm control unit shall be provided with enough spare capacity for future expansion of system upon required replacement of existing system in existing middle school and future required upgrade of existing building fire alarm system coverage to current codes.

B. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

- C. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:
 - 1. Pathway Class Designations: NFPA 72, Class B.
 - 2. Install no more than 50 addressable devices on each signaling-line circuit.
 - 3. Serial Interfaces:
 - a. One dedicated RS 485 port for remote station operation using point ID DACT.
 - b. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
 - c. One USB port for PC configuration.
 - d. One RS232 port for voice evacuation interface.

- D. Smoke-Alarm Verification:
 - 1. Initiate audible and visible indication of an "alarm-verification" signal at fire-alarm control unit.
 - 2. Activate an approved "alarm-verification" sequence at fire-alarm control unit and detector.
 - 3. Sound general alarm if the alarm is verified.
 - 4. Cancel fire-alarm control unit indication and system reset if the alarm is not verified.

- E. Notification-Appliance Circuit:
 - 1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
 - 2. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.

- F. Door Controls: Door hold-open devices that are controlled by smoke detectors at doors in smoke-barrier walls shall be connected to fire-alarm system.

- G. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.

- H. Voice/Alarm Signaling Service: Central emergency communication system with redundant microphones, preamplifiers, amplifiers, and tone generators provided as a special module that is part of fire-alarm control unit.
 - 1. Indicate number of alarm channels for automatic, simultaneous transmission of different announcements to different zones or for manual transmission of announcements by use of the central-control microphone. Amplifiers shall comply with UL 1711.
 - a. Allow the application of, and evacuation signal to, indicated number of zones and, at the same time, allow voice paging to the other zones selectively or in any combination.
 - b. Programmable tone and message sequence selection.
 - c. Standard digitally recorded messages for "Evacuation" and "All Clear."
 - d. Generate tones to be sequenced with audio messages of type recommended by NFPA 72 and that are compatible with tone patterns of notification-appliance circuits of fire-alarm control unit.
 - 2. Status Annunciator: Indicate the status of various voice/alarm speaker zones and the status of firefighters' two-way telephone communication zones.

3. Preamplifiers, amplifiers, and tone generators shall automatically transfer to backup units, on primary equipment failure.
- I. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals, supervisory and cellular alarm communicator transmitters shall be powered by 24-V dc source.
 1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.
- J. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.
 1. Batteries: Sealed lead calcium.

2.4 MANUAL FIRE-ALARM BOXES

1. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.
2. Double-action mechanism requiring two actions to initiate an alarm, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.

2.5 SYSTEM SMOKE DETECTORS

- A. General Requirements for System Smoke Detectors:
 1. Comply with UL 268; operating at 24-V dc, nominal.
 2. Detectors shall be two-wire type.
 3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
 4. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
 5. Integral Visual-Indicating Light: LED type, indicating detector has operated .
- B. Photoelectric Smoke Detectors:
 1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.

- d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
- C. Duct Smoke Detectors: Photoelectric type complying with UL 268A.
- 1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
 - 2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
 - a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
 - 3. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
 - 4. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.6 HEAT DETECTORS

- A. General Requirements for Heat Detectors: Comply with UL 521.
 - 1. Temperature sensors shall test for and communicate the sensitivity range of the device.
- B. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F (57 deg C) or a rate of rise that exceeds 15 deg F (8 deg C) per minute unless otherwise indicated.
 - 1. Mounting: Adapter plate for outlet box mounting.
 - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.7 NOTIFICATION APPLIANCES

- A. General Requirements for Notification Appliances: Individually addressed, connected to a signaling-line circuit, equipped for mounting as indicated, and with screw terminals for system connections.
 - 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
- B. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level as indicated on drawings, measured 10 feet (3 m) from the horn, using the coded signal prescribed in UL 464 test protocol.
- C. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- (25-mm-) high letters on the lens.

1. Rated Light Output:
 - a. As indicated on drawings.
2. Mounting: Wall mounted unless otherwise indicated.
3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
4. Flashing shall be in a temporal pattern, synchronized with other units.
5. Strobe Leads: Factory connected to screw terminals.
6. Mounting Faceplate: Factory finished, red.

D. Voice/Tone Notification Appliances:

1. Comply with UL 1480.
2. Speakers for Voice Notification: Locate speakers for voice notification to provide the intelligibility requirements of the "Notification Appliances" and "Emergency Communications Systems" chapters in NFPA 72.
3. High-Range Units: Rated 2 to 15 W.

2.8 ADDRESSABLE INTERFACE DEVICE

A. General:

1. Include address-setting means on the module.
2. Store an internal identifying code for control panel use to identify the module type.

B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.

2.9 DIGITAL ALARM COMMUNICATOR TRANSMITTER

A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632.

B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture [one] [two] telephone line(s) and dial a preset number for a remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.

C. Local functions and display at the digital alarm communicator transmitter shall include the following:

1. Verification that both telephone lines are available.
2. Programming device.

3. LED display.
4. Manual test report function and manual transmission clear indication.
5. Communications failure with the central station or fire-alarm control unit.

D. Digital Data transmission shall include the following:

1. Address of the alarm-initiating device.
2. Address of the supervisory signal.
3. Address of the trouble-initiating device.
4. Loss of ac supply.
5. Loss of power.
6. Low battery.
7. Abnormal test signal.
8. Communication bus failure.

2.10 NETWORK COMMUNICATIONS

- A. Provide network communications for fire-alarm system according to fire-alarm manufacturer's written requirements.

2.11 DEVICE GUARDS

- A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.
 1. Factory fabricated and furnished by device manufacturer.
 2. Finish: Paint of color to match the protected device.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
- B. Install wall-mounted equipment, with tops of cabinets not more than 78 inches (1980 mm) above the finished floor, unless noted otherwise.
- C. Manual Fire-Alarm Boxes:
 - 1. Install manual fire-alarm box in the normal path of egress within 60 inches (1520 mm) of the exit doorway.
 - 2. Mount manual fire-alarm box on a background of a contrasting color.
 - 3. The operable part of manual fire-alarm box shall be between 42 inches (1060 mm) and 48 inches (1220 mm) above floor level. All devices shall be mounted at the same height unless otherwise indicated.
 - 4. HVAC: Locate detectors not closer than 36 inches (910 mm) from air-supply diffuser or return-air opening.
 - 5. Lighting Fixtures: Locate detectors not closer than 12 inches (300 mm) from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.
- D. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.
- E. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches (9100 mm) long shall be supported at both ends.
- F. Audible Alarm-Indicating Devices: Install not less than 6 inches (150 mm) below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.
- G. Visible Alarm-Indicating Devices: Install adjacent to each alarm horn and at least 6 inches (150 mm) below the ceiling. Install all devices at the same height unless otherwise indicated.

3.3 PATHWAYS

- A. Pathways shall be installed in conduit.

3.4 CONNECTIONS

- A. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches (910 mm) from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 - 1. Magnetically held-open doors.
 - 2. Supervisory connections at valve supervisory switches.

3.5 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.6 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by Architect.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.
 - a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 - 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - 3. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.
- H. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.7 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of manufacturer's designated service organization. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning,

and adjusting as required for proper operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.8 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION

