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The Project Manual, Technical Specifications, Drawings, and all other documents relating to this project have been prepared for this individual and particular project, and for the exclusive use of the original Owner, developer or other party so indicated.

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GOODWYN, MILLS AND CAWOOD, INC.

GMCNETWORK.COM
PROJECT DIRECTORY

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Stanley Menefee, Chairman

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Phone: (205) 995-1078
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Robert C. Renfro, P.E.

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ADVERTISEMENT FOR BIDS

“SEALED PROPOSALS will be received by the Limestone County Commission, at the Limestone Courthouse Annex, located at 310 West Washington Street, Athens, Alabama 35611; until 2:00 PM Local Time, Tuesday, October 29, 2013, for this project:"

LIMESTONE COUNTY TEMPORARY COURTHOUSE
LIMESTONE COUNTY COMMISSION
Athens, Alabama
(Locally Funded)

at which time and place they will be publicly opened and read.

A cashiers check or bid bond payable to LIMESTONE COUNTY COMMISSION in an amount not less than five (5) percent of the amount of the bid, but in no event more than $10,000, must accompany the bidder's proposal. Performance and statutory Labor and Material Payment Bonds, and insurance in compliance with requirements, will be required at the signing of the Contract.

Drawings and Specifications may be examined at the Office of the Architect; McGraw-Hill Dodge Plan Room; AL AGC/iSqFt Plan Room and Reed Construction Data.

Bid documents (Plans and Specifications) can be purchased on CD from Goodwyn, Mills and Cawood, Inc., for $50.00 (non-refundable) or a paper set can be ordered for a cost of $250.00 and picked-up or shipped upon receipt of the deposit, made payable to: Goodwyn, Mills and Cawood, Inc., which will be refunded in full on the first two (2) sets issued to each bidder submitting a bonafide bid, upon return of documents to Goodwyn, Mills and Cawood, Inc., in good and reusable condition within ten (10) days after bid date. No refund will be made if the General Contractor, after ordering plans and specifications, chooses not to place a bonafide bid or does not return the plans and specifications in good reusable condition within 10 days after bid date. Other sets for general contractors, and sets for sub contractors and suppliers, may be obtained with the same deposit, which will be refunded as above, less the cost of printing, reproduction, handling and distribution which is estimated to be equal to the deposit. Partial sets will not be available. To order plans, or a CD, your deposit check should be faxed then mailed to Goodwyn, Mills and Cawood, Inc., Attn: Linda Geistman, 2701 1st Avenue South, Suite 100, Birmingham, AL 35233, Fax No. (205) 879-4493.

Only General Contractors who are properly licensed in accordance with criteria established by the State Licensing Board for General Contractors under the Provision of Title 34, Chapter 8, Code of Alabama, 1975, as amended, will be considered for the Work of this project.

The Owner reserves the right to reject any or all proposals, to waive technical errors and/or abandon the prequalification and bid process if, in their judgment, the best interests of the Owner will thereby be promoted.

LIMESTONE COUNTY COMMISSION
Stanley Menefee, Chairman
310 West Washington St.
Athens, AL 35611
Phone: (256) 233-6400
Fax: (256) 233-6403

END OF ADVERTISEMENT
GOODWYN, MILLS & CAWOOD, INC.
MEMBERS, AMERICAN INSTITUTE OF ARCHITECTS
2701 1st Avenue South, Suite 100
Birmingham, Alabama  35233
Phone: (205) 879-4462
Fax:    (205) 879-4493

NOTE: For projects exceeding $50,000, this notice must be run once a week for three successive weeks in a newspaper of general circulation in the county or counties in which the project, or any part of the project, is to be performed. If the project involves an estimated amount exceeding $500,000, this notice must also be run at least once in three newspapers of general circulation throughout the state. Proof of publication is required.

    ABC Form C-1;  August 2001.

TO ADVERTISE:

Birmingham News        Huntsville Times        Montgomery Advertiser
LIMITED COUNTY TEMPORARY COURTHOUSE
ATHENS, ALABAMA
LIMITED COUNTY

ADDITIONS TO A.I.A. INSTRUCTIONS TO BIDDERS

1.1 A.I.A. INSTRUCTIONS TO BIDDERS:

A. Printed Form A701, “Instructions to Bidders”, (1997 edition) issued by the American Institute of Architects, is part of these specifications as if written in full herein. A draft copy of this form is attached for reference. In case of conflict, these specifications take precedence over and modify aforesaid AIA Instructions to Bidders. Submission of a proposal will be evidence that the articles have been examined, read, and accepted as part of these contract documents, including the revisions as noted hereinafter.

1.2 ADDITIONS TO A.I.A. INSTRUCTIONS TO BIDDERS:

A. In Article 4 - BIDDING PROCEDURES, add the following:

“4.5 PROPOSAL

a. Proposal shall not contain any recapitulation of work to be done.

b. Telegraphic modifications will be considered if received by the Owner before opening hour, provided a letter of confirmation is received by the Owner within 48 hours thereafter.

c. Proposal shall be delivered enclosed in an opaque envelope marked “LIMITED COUNTY TEMPORARY COURTHOUSE For LIMESTONE COUNTY; Athens, Alabama”, and shall bear the name and address of the bidder and their Alabama General Contractor License Number.

d. Proposals shall be submitted on Proposal Forms provided; Numbers shall be both in writing and in figures. If words and figures conflict, the words shall govern. Addenda, if any, must be acknowledged. Signature shall be in long hand and in ink, and forms shall be complete without interlineation, alterations or erasures. Anyone signing proposal and contract as an agent of a firm or corporation shall present legal evidence of their authority.

4.6 CERTIFIED CHECKS OR BID BONDS

a. Each proposal must be accompanied by a certified check or bid bond issued by an acceptable surety company for not less than 5% of the bid, but in no event more than $10,000 made payable to the Owner, as a guarantee that the successful Bidder will, within 10 days from receipt of notice to that effect, enter into a contract for performance of the work awarded to them. Proceeds of the check or Bid Bond will become property of the Owner if the bidder withdraws from competition after opening of bids or fails to execute the required contract or bonds, if their bid is accepted by Owner.”

B. In Article 7 - PERFORMANCE BOND AND PAYMENT BOND, add the following:

“7.3 PERFORMANCE BOND AND PAYMENT BOND

7.3.1 Performance and Payment Bond equal to 100% of the contract price will be required of the Bidder to whom the contract or any part(s) of the contract is awarded. This bond must be acceptable
to the Owner, and shall be attached (along with acceptable insurance certificate(s) in compliance with requirements) to each copy of the contract executed by the Contractor.

7.3.2 Performance Bond shall also extend as a maintenance bond for one year after the date of acceptance of the entire project. Said bond shall guarantee against defective materials and workmanship which may develop during that time, in any portion of the work included in the contract.

7.3.3 Performance Bond and Labor and Material Payment Bond shall be executed on AIA Document A312, copies of which are available for viewing in the office of the Architect, and which can be purchased from an AIA documents vendor by the Contractor and/or their surety.”

END OF ADDITIONS TO A.I.A. INSTRUCTIONS TO BIDDERS
Instructions to Bidders

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

THE OWNER:
(Name and address):

THE ARCHITECT:
(Name and address):

TABLE OF ARTICLES

1  DEFINITIONS
2  BIDDER'S REPRESENTATIONS
3  BIDDING DOCUMENTS
4  BIDDING PROCEDURES
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8  FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

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

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

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ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

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

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

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

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

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

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

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

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

ARTICLE 2 BIDDER’S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

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

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

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

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 COPIES

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

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

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

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

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

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

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

§ 3.3 SUBSTITUTIONS

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

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

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

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

§ 3.4 ADDENDA

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

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

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

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

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

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

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

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

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

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form for qualify the Bid in any other manner.

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

§ 4.2 BID SECURITY

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

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

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

§ 4.3 SUBMISSION OF BIDS

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

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

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

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

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND
§ 7.1 BOND REQUIREMENTS
§ 7.1.1 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. Bonds may be secured through the Bidder's usual sources.

§ 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 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

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

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

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

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

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR
Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.
1.1 PREQUALIFIED GENERAL CONTRACTOR BIDDERS:

A. The following General Contractor Bidders for ______________________________________ were prequalified following legal advertisement and the Owner's procedure for selection. Application for this prequalification concluded at 2:00 PM local time on _________________, 2011.

(Listed in alphabetical order)

END OF ATTACHMENT A TO INSTRUCTIONS TO BIDDERS
PROPOSAL FORM

To: _______________ LIMESTONE COUNTY COMMISSION _______________ Date: ____________________________

(Awarding Authority)

In compliance with your Advertisement for Bids and subject to all the conditions thereof, the undersigned, ______________________, (Legal Name of Bidder)

hereby proposes to furnish all labor and materials and perform all work required for the construction of WORK: _______________ LIMESTONE COUNTY TEMPORARY COURTHOUSE, ATHENS, ALABAMA, FOR LIMESTONE COUNTY _______________ in accordance with Drawings and Specifications, dated __________, October 11, 2013, prepared by _______________ GOODWYN, MILLS & CAWOOD, INC. (Architect’s Project No. ABHM130022R), Architect/Engineer.

The Bidder, which is organized and existing under the laws of the State of ______________________________, having its principal offices in the City of ______________________________, is: □ a Corporation □ a Partnership □ an Individual □ (other) ______________________________.

LISTING OF PARTNERS OR OFFICERS: If Bidder is a Partnership, list all partners and their addresses; if Bidder is a Corporation, list the names, titles, and business addresses of its officers:

BIDDER’S REPRESENTATION: The Bidder declares that it has examined the site of the Work, having become fully informed regarding all pertinent conditions, and that it has examined the Drawings and Specifications (including all Addenda received) for the Work and the other Bid and Contract Documents relative thereto, and that it has satisfied itself relative to the Work to be performed.

ADDENDA: The Bidder acknowledges receipt of Addenda No’s. __________ through __________ inclusively.

BASE BID: For construction complete as shown and specified, the sum of: ______________________________ Dollars ($__________________)

ALTERNATES: No Alternates.
ALLOWANCES: Refer to Section 01210 - “Allowances”, and Drawings for descriptions and requirements.

COMPLETION DATE: All Base Bid and any Alternate Work in the Contract shall be “Substantially Complete” within 120 consecutive days, from the earlier of either the date of the Owner’s written “Notice To Proceed” or the Contractor’s receipt of the fully executed Contract.

UNIT PRICES: Refer to “Attachment A to Proposal Form” (DUE along with Proposal Form on Bid Date).

CHANGES IN WORK: Changes in the Work shall be addressed as described in General Conditions Article on Changes in the Work (and as modified by Supplementary Conditions).

MAJOR SUBCONTRACTOR & SUPPLIER LISTING: Refer to “Attachment B to Proposal Form” (DUE along with Proposal Form on Bid Date, or at Contractor’s option, turned in to the Owner within 24-hours after receipt of Bids, with a copy to the Architect).

BID SECURITY: The undersigned agrees to enter into a Construction Contract and furnish the prescribed Performance and Payment Bonds and evidence of insurance within fifteen calendar days, or such other period stated in the Bid Documents, after the contract forms have been presented for signature, provided such presentation is made within 60 calendar days after the opening of bids, or such other period stated in the Bid Documents. As security for this condition, the undersigned further agrees that the funds represented by the Bid Bond (or cashier’s check) attached hereto may be called and paid into the account of the Awarding Authority as liquidated damages for failure to so comply.

Attached hereto is a: (Mark the appropriate box and provide the applicable information.)

☐ Bid Bond, executed by _______________________________ as Surety,

☐ a cashier’s check on the ______________________ Bank of ______________________,

for the sum of _______________________________ Dollars

($____________________) made payable to the Awarding Authority.

BIDDER’S ALABAMA LICENSE:

State License for General Contracting: __________________________________________

<table>
<thead>
<tr>
<th>License Number</th>
<th>Contractor’s DUNS No.</th>
<th>Bid Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Type(s) of Work
CERTIFICATIONS: The undersigned certifies that he or she is authorized to execute contracts on behalf of the Bidder as legally named, that this proposal is submitted in good faith without fraud or collusion with any other bidder, that the information indicated in this document is true and complete, and that the bid is made in full accord with State law. Notice of acceptance may be sent to the undersigned at the address set forth below.

The Bidder also declares that a list of all proposed major subcontractors and suppliers is included and attached to the Proposal Form, or will be turned in to the Owner within twenty-four (24) hours after receipt of bids, with a copy to the Architect.

Bidder certifies that vendors, subcontractors and affiliates, that make sales for delivery into Alabama or leases for use in Alabama are registered, collecting, and remitting Alabama state and local sales, use, and /or lease tax on all taxable sales and leases into Alabama. By submitting a proposal, contractor is hereby certifying that he and his company are in full compliance with Act No. 2006-557, and not barred from bidding or entering into a contract pursuant to 41-4-116 (Code of Alabama 1975), and acknowledge that the awarding authority may declare the contract void if the certification is false.

Legal Name of Bidder

Mailing Address

* By (Legal Signature) ______________________________________________
* Name (type or print) ______________________________________________ (Seal)
* Title ______________________________________________
Telephone Number ______________________________________________

* If other than the individual proprietor, or an above named member of the Partnership, or the above named president, vice-president, or secretary of the Corporation, attach written authority to bind the Bidder. Any modification to a bid shall be over the initials of the person signing the bid, or of an authorized representative.

END OF PROPOSAL FORM
## ATTACHMENT A

### TO PROPOSAL FORM

### 1.1 UNIT PRICES:

A. The undersigned proposes the following Unit Prices for additions to or deductions from the Work wherein Unit Prices are applicable as determined by the Architect and Owner. These Unit Prices include all charges for labor and materials, fee, layout, supervision (field and home office), general expenses, taxes, insurance, overhead and profit, for Unit Item of Work in place. The Contract sum shall be increased or decreased based upon quantity difference multiplied by the applicable Unit Price, in accordance with the General Conditions.

B. Refer to Section 01270 - “Unit Prices”, and to the respective sections of the Specifications for the complete Unit Price Item description.

C. Submit the following Unit Prices with the Proposal Form on Bid Date.

<table>
<thead>
<tr>
<th>ITEM DESCRIPTION</th>
<th>UNIT:*</th>
<th>UNIT PRICE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sealed Concrete</td>
<td>SF</td>
<td>$ ____________</td>
</tr>
<tr>
<td>2. Floor Trench</td>
<td>LF</td>
<td>$ ____________</td>
</tr>
<tr>
<td>3. VCT Flooring</td>
<td>SF</td>
<td>$ ____________</td>
</tr>
<tr>
<td>4. Rubber Base</td>
<td>LF</td>
<td>$ ____________</td>
</tr>
<tr>
<td>5. Carpet</td>
<td>SF</td>
<td>$ ____________</td>
</tr>
<tr>
<td>6. LAC1 Ceiling Tile &amp; Grid</td>
<td>SF</td>
<td>$ ____________</td>
</tr>
<tr>
<td>7. Wood Doors</td>
<td>EA</td>
<td>$ ____________</td>
</tr>
<tr>
<td>8. HM Frames</td>
<td>EA</td>
<td>$ ____________</td>
</tr>
<tr>
<td>9. 2x4 Light Fixture Installed</td>
<td>EA</td>
<td>$ ____________</td>
</tr>
</tbody>
</table>

(*) Legend to “unit” quantity abbreviations:  
   - SF: Per “Square Foot”  
   - LF: Per “Linear Foot”  
   - EA: Per “Each”
END OF ATTACHMENT A TO PROPOSAL FORM
## ATTACHMENT "B"

### TO PROPOSAL FORM

#### 1.1 SUBCONTRACTORS LISTING:

A. Submit the following Subcontractors names with the Proposal Form by 2:00 PM local time on Bid Date, OR at Contractor’s option, turned in to the Owner within 24-hours of the time scheduled for the opening of Bids, with a copy to the Architect:

<table>
<thead>
<tr>
<th>NO.:</th>
<th>SPECIFICATION SECTION:</th>
<th>PRINCIPAL SUBCONTRACTOR OR SUPPLIER - NAME and LOCATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SECTION 02225 &quot;SELECTIVE DEMOLITION&quot;:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(LOCATION - CITY and STATE)</td>
</tr>
<tr>
<td>2</td>
<td>SECTION 03310 - &quot;CONCRETE WORK&quot;:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(LOCATION - CITY and STATE)</td>
</tr>
<tr>
<td>3</td>
<td>SECTION 03366 - &quot;SEALED CONCRETE FLOOR&quot;:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(LOCATION - CITY and STATE)</td>
</tr>
<tr>
<td>4</td>
<td>SECTION 04810 - &quot;UNIT MASONRY ASSEMBLIES&quot;:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(LOCATION - CITY and STATE)</td>
</tr>
<tr>
<td>5</td>
<td>SECTION 05120 - &quot;STRUCTURAL STEEL&quot;:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(LOCATION - CITY and STATE)</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Firm Name</td>
</tr>
<tr>
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</tr>
<tr>
<td>6</td>
<td>SECTION 05120 - “STEEL JOISTS”</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>SECTION 05310 - “STEEL DECK”</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SECTION 05400 - “COLD-FORMED METAL FRAMING”</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>SECTION 05520 - “HANDRAILS &amp; RAILINGS”</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>SECTION 05810 - “EXPANSION JOINT COVER ASSEMBLIES”</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>SECTION 06100 - “ROUGH CARPENTRY”</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>SECTION 06200 – &quot;FINISH CARPENTRY&quot;</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>SECTION 06400 – &quot;ARCHITECTURAL WOODWORK&quot;</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>SECTION 07140 - “FLUID APPLIED WATERPROOFING”</td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Firm Name</td>
</tr>
<tr>
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<td>--------------------------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>15</td>
<td>SECTION 07212 - &quot;BOARD AND BATT INSULATION&quot;</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>16</td>
<td>SECTION 07240 - &quot;EXTERIOR INSULATION &amp; FINISH SYSTEM&quot;</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>17</td>
<td>SECTION 07260 - &quot;WEATHER BARRIERS&quot;</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>18</td>
<td>SECTION 07540 - &quot;THERMOPLASTIC MEMBRANE ROOFING (PVC)&quot;</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>19</td>
<td>SECTION 07620 - &quot;SHEET METAL FLASHING AND TRIM&quot;</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>20</td>
<td>SECTION 07631 - &quot;GUTTERS &amp; DOWNSPOUTS&quot;</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>21</td>
<td>SECTION 07710 - &quot;MANUFACTURED ROOF SPECIALTIES&quot;</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>22</td>
<td>SECTION 07900 - &quot;JOINT SEALERS&quot;</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>23</td>
<td>SECTION 08110 - &quot;STEEL DOORS AND FRAMES&quot;</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Firm Name</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>08211</td>
<td>&quot;Flush Wood Doors&quot;</td>
<td></td>
</tr>
<tr>
<td>08310</td>
<td>&quot;Access Doors and Panels&quot;</td>
<td></td>
</tr>
<tr>
<td>08410</td>
<td>&quot;Metal-Framed Storefronts&quot;</td>
<td></td>
</tr>
<tr>
<td>08522</td>
<td>&quot;Aluminum Windows&quot;</td>
<td></td>
</tr>
<tr>
<td>08710</td>
<td>&quot;Finish Hardware&quot;</td>
<td></td>
</tr>
<tr>
<td>08800</td>
<td>&quot;Glass and Glazing&quot;</td>
<td></td>
</tr>
<tr>
<td>09260</td>
<td>&quot;Gypsum Board Assemblies&quot;</td>
<td></td>
</tr>
<tr>
<td>09511</td>
<td>&quot;Suspended Acoustical Ceilings&quot;</td>
<td></td>
</tr>
<tr>
<td>09650</td>
<td>&quot;Resilient Flooring&quot;</td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
<td>Firm Name</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>33</td>
<td>SECTION 09680 - “CARPET”:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>34</td>
<td>SECTION 09900 - “PAINTS AND COATINGS”:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>35</td>
<td>SECTION 10160 - “METAL TOILET COMPARTMENTS”:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>36</td>
<td>SECTION 10260 - “WALL AND CORNER GUARDS”:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>37</td>
<td>SECTION 10400 - “IDENTIFICATION DEVICES”:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>38</td>
<td>SECTION 10523 - “FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES”:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>39</td>
<td>SECTION 10530 - “CANOPIES”:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>40</td>
<td>SECTION 11132 - “PROJECTION SCREENS AND PROJECTORS”:</td>
<td>(FIRM NAME)</td>
</tr>
<tr>
<td>41</td>
<td>DIVISION 15 - PLUMBING SUBCONTRACTOR:</td>
<td>(FIRM NAME)</td>
</tr>
</tbody>
</table>
This list is not necessarily all inclusive. Submit all primary subcontractors whether their trade is listed here or not.

END OF ATTACHMENT "B" TO PROPOSAL FORM
IMMIGRATION STATUS VERIFICATION

1.1 GENERAL:

A. Bidders are hereby reminded that they are required to comply with requirements of Alabama Immigration Law, Act 2011-535 (also referred to as the “Beason-Hammon Alabama Taxpayer and Citizen Protection Act”, or H.B. 56). This Law was amended by Act No. 2012-491 and signed into law by the Governor May 18, 2012. The following requirements are in effect:

1. Contractors are required to enroll in the E-Verify program of the United States Department of Homeland Security and to provide documentation of enrollment in the E-Verify program with their contracts and agreements. E-Verify MOU shall be submitted with Proposal Form.

2. Statement of Compliance with Act No. 2012-491 shall be attached to Construction Contract, and shall include the following statement:

   By signing this contract, the contracting parties affirm, for the duration of the agreement, that they will not violate federal immigration law or knowingly employ, hire for employment, or continue to employ an unauthorized alien within the State of Alabama. Furthermore, a contracting party found to be in violation of this provision shall be deemed in breach of the agreement and shall be responsible for all damages resulting therefrom.

B. Additional information and Guidance is available at the following websites:


2. Alabama Department of Finance, Comptroller’s Website - Compliance Guidelines:
   http://comptroller.alabama.gov/pdfs/Memos/2012-01-06%20Alabama%20Immigration%20Law.pdf

3. Alabama Secretary of State’s Website: Including in part, rules and acceptable form for affidavits for business entities, employers, contractors, and subcontractors.
   http://www.sos.state.al.us/

4. Alabama Building Commission:
   http://www.bc.state.al.us/Memo%20on%20Act%202011-535-Alabama%20Immigration%20Law-1-11-2012.pdf

5. US Department of Homeland Security, E-Verify:
   www.dhs.gov/E-Verify
BID BOND FORM

1.1 Bid Bond shall be executed equivalent to AIA Document A310, Bid Bond. A draft copy is attached for reference. Copies of A310 are available for viewing in the office of the Architect, and may be purchased from an AIA documents vendor by the Contractor.

END OF BID BOND FORM
Bid Bond

CONTRACTOR:  
(Name, legal status and address)
« »« »
« »

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

OWNER:  
(Name, legal status and address)
« »« »
« »

BOND AMOUNT: $ « »

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

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

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

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

(Principal)  (Seal)

(Witness)

(Title)

(Surety)  (Seal)

(Witness)  (Title)
CONSTRUCTION CONTRACT FORM

1.1 The Construction Agreement shall be executed on A.I.A. Document A101CMa - 1992 Edition. Copies are available for viewing in the office of the Architect, and may be purchased from an A.I.A. documents vendor by the Contractor.

END OF CONSTRUCTION CONTRACT FORM
PERFORMANCE BOND AND PAYMENT BOND FORM

1.1 Performance and Payment Bond shall be provided for 100% of the Contract amount. Performance Bond shall be executed on dual obligee form. Payment Bond shall be executed on AIA Document A312, latest edition. A draft of AIA Document A312 – 2010 is attached. Copies of document are available for viewing in the office of the Architect, and can be purchased from an AIA documents vendor by the Contractor and/or their surety.

END OF PERFORMANCE BOND AND PAYMENT BOND FORM
### Payment Bond

<table>
<thead>
<tr>
<th>CONTRACTOR:</th>
<th>SURETY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Name, legal status and address)</td>
<td>(Name, legal status and principal place of business)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OWNER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Name, legal status and address)</td>
</tr>
<tr>
<td>« » « » « » « »</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONSTRUCTION CONTRACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: « » « » « » « »</td>
</tr>
<tr>
<td>Amount: $ « » « » « » « »</td>
</tr>
<tr>
<td>Description: (Name and location)</td>
</tr>
<tr>
<td>« » « » « » « »</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BOND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: « » « » « » « »</td>
</tr>
<tr>
<td>(Not earlier than Construction Contract Date)</td>
</tr>
<tr>
<td>Amount: $ « » « » « » « »</td>
</tr>
<tr>
<td>Modifications to this Bond: « » « » « » « » « »</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTRACTOR AS PRINCIPAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company: (Corporate Seal)</td>
</tr>
<tr>
<td>Signature: Name and Title: « » « » « » « »</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SURETY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company: (Corporate Seal)</td>
</tr>
<tr>
<td>Signature: Name and Title: « » « » « » « »</td>
</tr>
</tbody>
</table>

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

**FOR INFORMATION ONLY — Name, address and telephone**

<table>
<thead>
<tr>
<th>AGENT or BROKER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>« » « » « » « »</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OWNER'S REPRESENTATIVE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Architect, Engineer or other party:)</td>
</tr>
</tbody>
</table>

**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.

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.
§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner’s priority to use the funds for the completion of the work.
§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

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

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

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

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

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

§ 16 Definitions

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

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

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

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

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

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

§ 18 Modifications to this bond are as follows:

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

CONTRACTOR AS PRINCIPAL

Company: ____________________________ (Corporate Seal)

Name and Title: ____________________________

Address: ____________________________

SURETY

Company: ____________________________ (Corporate Seal)

Signature: ____________________________

Name and Title: ____________________________

Address: ____________________________
**GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION**

1.1 The “General Conditions of the Contract for Construction,” A.I.A. Document A201, 2007 Edition, (also referred to as “General Conditions”, “Conditions of the Contract”, etc.), Articles 1 through 15, inclusive, is a part of this contract, and is incorporated herein as fully as if here set forth.

1.2 Copies of A.I.A. Document A201 are available for viewing in the office of the Architect, and can be purchased from an A.I.A. documents vendor by the Contractor.

1.3 See “Supplementary Conditions” and “Special Conditions” for supplements which modify, change, delete, and/or add to the General Conditions.

1.4 A draft copy of A201 – 2007 is attached for reference.

**END OF GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION**
for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name and address)

THE ARCHITECT:
(Name and address)

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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.

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

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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 requirements.

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

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

§ 1.1.4 THE PROJECT
The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

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

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

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

§ 1.1.8 INITIAL DECISION MAKER
The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

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

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

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

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

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

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

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

ARTICLE 2 OWNER
§ 2.1 GENERAL
§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner’s approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term “Owner” means the Owner or the Owner’s authorized representative.

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

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner’s obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner’s ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or...
§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

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

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

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

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

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

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

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

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect’s administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.
§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR
§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

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

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

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

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES
§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor’s best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

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

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

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

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

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

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

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

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

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

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

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor’s cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect’s determination or recommendation, that party may proceed as provided in Article 15.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be
Paragraphs missing from the provided text.
§ 3.18 INDEMNIFICATION
§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect’s consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 3.18.

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

ARTICLE 4 ARCHITECT
§ 4.1 GENERAL
§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identiﬁed as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

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

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

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

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

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deﬁciencies observed in the Work. The Architect will not be responsible for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.
§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect’s consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

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

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

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

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

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

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

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

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

§ 4.2.13 The Architect’s decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.
§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS
§ 5.1 DEFINITIONS
§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term “Subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a separate contractor or subcontractors of a separate contractor.

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

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK
§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

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

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

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

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

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

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

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

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
§ 6.1 OWNER’S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS
§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to those including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

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

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

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

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

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

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

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

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

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

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

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

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

§ 7.2 CHANGE ORDERS
§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:
  .1 The change in the Work;
  .2 The amount of the adjustment, if any, in the Contract Sum; and
  .3 The extent of the adjustment, if any, in the Contract Time.

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

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

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
  .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
  .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
  .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

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

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

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, 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 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers’ compensation insurance;
.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and
.5 Additional costs of supervision and field office personnel directly attributable to the change.

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

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

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

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.
ARTICLE 8 TIME
§ 8.1 DEFINITIONS
§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

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

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

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

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

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

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

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

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

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

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

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

§ 9.3 APPLICATIONS FOR PAYMENT
§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.
§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

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

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

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

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor’s Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect’s reasons for withholding certification in whole or in part as provided in Section 9.5.1.

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

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

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

1. defective Work not remedied;
2. third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a separate contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 9.9 PARTIAL OCCUPANCY OR USE
§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have agreed in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

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

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

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

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner’s property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys’ fees.

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

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

1. liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
2. failure of the Work to comply with the requirements of the Contract Documents; or
3. terms of special warranties required by the Contract Documents.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

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

§ 10.2 SAFETY OF PERSONS AND PROPERTY

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

1. employees on the Work and other persons who may be affected thereby;
2. the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor’s Subcontractors or Sub-subcontractors; and
3. other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

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

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

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

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

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

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

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

§ 10.3 HAZARDOUS MATERIALS

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

§ 10.3.2 Upon receipt of the Contractor’s written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor’s reasonable additional costs of shut-down, delay and start-up.
§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect’s consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 11.3.3 LOSS OF USE INSURANCE
The Owner, at the Owner’s option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner’s property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner’s property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

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

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

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

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner’s duties. The Owner shall deposit in a separate account proceeds so received, which the

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Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.
§ 13.5 TESTS AND INSPECTIONS
§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

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

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

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

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

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

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

§ 13.7 TIME LIMITS ON CLAIMS
The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT
§ 14.1 TERMINATION BY THE CONTRACTOR
§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

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

.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;
.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor’s request, reasonable evidence as required by Section 2.2.1.

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

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days’ written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

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

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE
§ 14.2.1 The Owner may terminate the Contract if the Contractor
.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor’s surety, if any, seven days’ written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:
.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
.2 Accept assignment of subcontracts pursuant to Section 5.4; and
.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

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

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE
§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.
§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

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

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE
§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner’s convenience and without cause.

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

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

§ 14.4.3 In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

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

§ 15.1.2 NOTICE OF CLAIMS
Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

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

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

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

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.
§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES
The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

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

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

This mutual waiver is applicable, without limitation, to all consequential damages due to either party’s termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION
§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

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

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

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

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

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

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.
§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor’s default, the Owner may, but is not obligated to, notify the surety and request the surety’s assistance in resolving the controversy.

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

§ 15.3 MEDIATION
§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

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

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

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

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

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

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

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

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

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

1.1 GENERAL CONDITIONS:

A. The “General Conditions of the Contract for Construction”, AIA Document A201, 2007 Edition, Articles 1 through 15, inclusive, (General Conditions or Conditions of the Contract hereinafter) is a part of this contract, and is incorporated herein as fully as if here set forth.

2.2 SUPPLEMENTS:

A. The following supplements, modify, change, delete or add to the General Conditions. Where any part of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered provisions of that part shall remain in effect.

1. ARTICLE 1 - GENERAL PROVISIONS:

a. Add the following sentences to the end of Subparagraph 1.1.1:

“Bidding Requirements” as enumerated in the Project Manual shall apply to the Work of this Contract to the extent of bidders’ responsibilities indicated. Regardless of Owner’s right to waive irregularities or technical errors, such irregularities and/or modifications in the Bidder’s responsiveness to the state d...

b. Add the following new subparagraph:

“1.5.3 Any written permission given for use of the Drawings, Specifications, and/or other Documents prepared by the Architect and/or the Architect’s consultants which is provided under the terms of this Article, shall require and be subject to payment to the Architect for such use, as determined to be equitable by the Architect or as mutually agreed in writing between the Architect and the party or parties requesting and receiving permission for any such use.”

c. Add the following new Subparagraphs:

1.6.1 The Architect may, with the concurrence of the Owner, furnish to the Contractor versions of Instruments of Service in electronic form. The Contract Documents executed or identified in accordance with Subparagraph 1.1.1 shall prevail in case of an inconsistency with subsequent versions made through manipulatable and/or non-manipulatable electronic operations involving computers.

1.6.2 The Contractor shall not transfer or reuse Instruments of Service in electronic or machine readable form without the prior written consent of the Architect, and payment to the Architect in amount(s) agreeable to the Architect for such use.
1.6.3 Representatives of the Owner, Contractor, and/or Architect shall meet periodically, if required by the Owner or Architect, at mutually agreed-upon intervals for the purpose of establishing procedures to facilitate cooperation, communication and timely responses among the participants. By participating in this arrangement, the parties do not intend to nor will they create additional contractual obligations or modify the legal relationships which may otherwise exist.”

2. **ARTICLE 2 - OWNER:**
   a. Refer to Paragraph 2.2.2, and add the following new Subparagraphs:

   2.2.2.1 Unless specifically indicated otherwise on the Drawings or in the Project Manual, the Owner will furnish all necessary Environmental and Storm Water Permits customarily required for this type of project; The Contractor shall comply with the requirements and directions of the Owner and/or imposed on the Owner for compliance with these requirements.”

   b. Delete Subparagraph 2.2.5 and substitute the following:

   “2.2.5 The Contractor will make these documents available in electronic format (PDF) for subcontractors to download.”

3. **ARTICLE 3 - CONTRACTOR:**
   a. Refer to Paragraph 3.2, and add the following new Subparagraph:

   “3.2.5 The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for the Architect to evaluate and respond to the Contractor’s requests for information, where such information was available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination Drawings, or prior Project correspondence and/or documentation.”

   b. Refer to Paragraph 3.3, and add the following new Subparagraph:

   “3.3.4 The Contractor shall lay out their own work. They shall be responsible for all work executed by them under the Contract which shall be constructed to the lines and grades as shown on the Drawings. They shall verify all figures and elevations before proceeding with the work, and will be held responsible for any error resulting from failures to do so.”

   c. Delete Paragraph 3.4.2, and substitute the following:

   “3.4.2 After the Contract has been executed, the Owner and Architect will consider a formal request for the substitution of products in place of those specified, only under the conditions set forth in the General Requirements (Division 1 of Specifications). By making requests for substitutions, the Contractor:
3.4.2.1 represents that the Contractor has personally investigated the proposed substitute product and determined that it is equivalent to or superior in all respects to that specified;

3.4.2.2 represents that the Contractor will provide at least the same warranty for the substitution that the Contractor would for that specified;

3.4.2.3 certifies that the cost data presented is complete and includes all related costs under this Contract, except the Architect’s redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and

3.4.2.4 will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.”

d. Add the following new Subparagraph:

“3.4.4 The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect to evaluate the Contractor’s proposed substitutions, regardless of whether or not the proposed substitution is subsequently accepted by the Owner and/or Architect, and to make agreed-upon changes in the Drawings and Specifications made necessary by the Owner’s acceptance of such substitutions.”

e. Revise the following Subparagraphs:

Before the semicolon at the end of Subparagraph 3.8.2.2, add the following:

“, except that if installation is included as part of an allowance in Divisions 1-16 of the Specifications, the installation and labor cost for greater or lesser quantities of Work shall be determined in accordance with Subparagraph 7.3.7, unless specifically indicated otherwise;”

Refer to Subparagraph 3.8.2.2, and add the following after the word “profit”:

“, temporary storage,”

Refer to Subparagraph 3.8.2.3, and add the following phrase at the end:

“, which could not reasonably be anticipated by the Contractor at the time of bidding, and/or which are not due to any cause or delay by the Contractor, and/or which are due to causes over which the Contractor had no control.”

f. Refer to Subparagraph 3.9.2, and add the following new Subparagraphs:

“3.9.2.1 Contractor’s Superintendent shall be properly qualified and have a minimum of five (5) years experience as superintendent for this Contractor. Contractor shall furnish within five days of their receipt of the Contract, records of proposed Superintendent’s education and experience, construction project experience and in what capacities, names of architects for these projects, and
information sufficient to determine suitability for the proposed position for this project.

3.9.2.2 Refer to Division 1 Section “Special Conditions”, and individual specifications sections throughout the Project Manual, for additional information and minimum experience requirements.”

g. Refer to Subparagraph 3.10.3, and add the following at the end:

“If the project is behind the Construction Schedule, the Contractor shall act on each portion which is not in general accordance with the Construction Schedule, to whatever extent is required to move progress of the Work back into general accordance with the Construction Schedule, at no additional cost to the Owner.”

h. Refer to Subparagraph 3.12.7, and change the word “approved” to read “reviewed”.

i. Refer to Subparagraphs 3.12.8 and 3.12.9, and revise the following:

Change the word “approved” to read “reviewed”, wherever it occurs.

Change the word “approval” to read “review”, wherever it occurs.

j. Add the following new Subparagraph:

“3.12.11 The Architect’s review of Contractor’s submittals will be limited to examination of an initial submittal and ONE (1) resubmittal. The Architect’s review of additional submittals will be made only with the consent of the Owner, after notification by the Architect. The Owner shall be entitled to deduct from the Contract Sum, amounts due to the Architect for evaluation of such additional resubmittals.”

k. Refer to Subparagraph 3.15.1, and add the following new Subparagraph:

“3.15.1.1 Remove broken or scratched glass and replace with new glass, remove paint droppings, spots, stains, and dirt from finished surfaces and exposed concrete, masonry, stucco, and similar surfaces, and clean plumbing fixtures, hardware, floors, and equipment. Contractor shall keep interior of the building free of stored or unattended combustible material.”

4. ARTICLE 4 - ADMINISTRATION OF THE CONTRACT:

a. Refer to Subparagraph 4.2.7, and revise as follows:

In first sentence, after the word “approve”, add “and/or make comments,”.

In the last two sentences, change the word “approval”, to read “review and/or approval”.
b. Refer to Subparagraph 4.2.9, and change the word “inspections”, to read “construction observations and final inspection(s)”.

5. ARTICLE 5 - SUBCONTRACTORS:

a. Refer to Subparagraph 5.2.1, and add the following new Subparagraph:

“5.2.1.1 Submittal of list as required of the Contractor, shall include all major Subcontractors and Suppliers, and shall be submitted not later than, either along with the Contractor’s completed Proposal Form, or shall be submitted to the Owner, with copy to Architect, within 24-hours of the time and date that bids are scheduled to be opened. Refer to Division 1 Section “Special Conditions” for additional information and minimum requirements.”

6. ARTICLE 7 - CHANGES IN THE WORK:

a. Refer to paragraph 7.2 Change Orders, and add the following new Subparagraph 7.2.2.

“7.2.2 Change Orders for this project shall have a total of 25% maximum mark-up if sub-contractor and general contractor are involved. Sub-contractor shall have 15% mark-up (10% to cover overhead such as insurance, bond, labor, labor burden, etc. and the remaining 5% for profit). Contractor shall have 10% mark-up (5% to cover all overhead as mentioned above under sub-contractor, and 5% for profit). If the general contractor self-performs the work then they shall be allowed 15% mark-up.

Should changes which will decrease the cost of the work be ordered by the Architect, then the Contract Price shall be reduced by an amount equal to the agreed estimated saving resulting from these changes, and further reduced by the Contractor’s 10% (and Subcontractor’s 15%, if applicable), or by the Contractor’s 15% (if self-performing the work) overhead and profit.

7. ARTICLE 8 - TIME:

a. Refer to Subparagraph 8.1.2, and add the following new Subparagraph:

“8.1.2.1 The date of commencement shall be established as the earlier of either the date the Contractor receives the fully executed Contract, or the date indicated on the Owner’s written “Notice To Proceed”, unless mutually agreed otherwise and in writing between the Owner and the Contractor.”

b. Refer to Subparagraph 8.2.2, and revise as follows:

At end of first sentence, omit the words “and Owner”.

8. ARTICLE 9 - PAYMENTS AND COMPLETION:

a. Refer to Subparagraph 9.2, and change the word “Architect”, to read “Architect and/or Owner”, wherever it occurs.
b. Refer to Subparagraph 9.3.1, and add the following sentence and new Subparagraphs:

“The form of Application of Payment, duly notarized, shall be a current authorized edition of AIA Document G702, or approved equivalent document, supported by a current authorized edition of AIA Document G703 or approved equivalent continuation sheet.

9.3.1.3 Until the Work is 100-percent complete, the Owner shall pay 95-percent of the first 50-percent of the amount due the Contractor on account of progress payments, and no additional retainage thereafter, except as otherwise provided. Unless for reasons otherwise provided in the Contract Documents, thereafter, there will be no further retainage withheld.

9.3.1.4 Upon completing all requirements to achieve Substantial Completion, as defined within the Contract Documents, the payment shall be sufficient to increase the total payments to 98-percent of the contract sum, less such amounts as the Architect and/or Owner shall determine for all incomplete work and unsettled claims, except as otherwise provided.”

c. Refer to Subparagraph 9.7, and revise as follows:

Change the word “seven”, to read “ten”, wherever it occurs.

Omit the last nine words, beginning with “, plus...” through the word “Documents”.

Add the following Sentence: “In the event it is deemed necessary by the Architect and/or Owner to return a request and/or requests for progress payment to the Contractor, the time limits indicated herein for payment shall begin from the date of receipt of a request for progress payment which is subsequently resubmitted, and found acceptable by the Architect and/or Owner.”

d. Refer to Subparagraph 9.8.3, and add the following new Subparagraph:

“9.8.3.1 Except with the consent of the Owner, the Architect will perform no more than one (1) inspection and one (1) reinspection to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional inspections and/or re-inspections due to incomplete work and/or unsettled claims.”

e. Refer to Subparagraph 9.8.5, delete the second sentence, and substitute the following:

“Upon such acceptance and consent of surety, if any, the Owner shall make payment sufficient to increase the total payments to 98-percent (98%) of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work and unsettled claims.”
f. Refer to Subparagraph 9.10.1, and add the following new Subparagraph:

“9.10.1.1 Except with the consent of the Owner, the Architect will perform no more than one (1) inspection and one (1) reinspection to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional inspections and/or re-inspections due to incomplete work, unsettled claims and/or other cause or causes attributable to the responsibilities of the Contractor.”

9. ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY:

a. Refer to Subparagraph 10.1, and add the following:

“In performing this work, the Contractor shall in part, take all necessary precautions for ample protection of personnel, property, and equipment from falling debris, dust, or undue exposure to weather. The safety provisions of applicable laws, building and construction codes shall be observed and applicable provisions of the latest edition of the AGC “Manual of Accident Prevention” shall be adhered to and followed. All passageways, guard fences, lights and other facilities required for protection of the public and workmen shall be provided and maintained.”

10. ARTICLE 11 - INSURANCE AND BONDS:

a. Delete Paragraphs 11.2, 11.3, and 11.4, and replace with the following:

“11.2 CONTRACTOR’S AND SUBCONTRACTOR’S MINIMUM LIABILITY INSURANCE:

11.2.1 The insurance required by Subparagraph 11.1 shall be written for not less than the following minimum limits of liability, or greater if required by law. Additionally named primary insureds shall be “the Owner, Architect, and their Consultants”, except not on Worker's Compensation; all insurance certificates shall provide for “Waiver of Subrogation” against “the Owner, Architect, and their Consultants”, by the Contractor, each Subcontractor, and their insurers. Refer also to Division 1 Section “Special Conditions”, for additional information and requirements.

11.2.2 MINIMUM COVERAGE(S) REQUIRED:

11.2.2.1 Workers' Compensation:

| a. State | Statutory |
| b. Applicable Federal | Statutory |
| c. Employer's Liability | $1,000,000 |
| d. Benefits Required by Union Labor Requirements | As applicable. |
e. Voluntary Compensation $1,000,000
f. Broad Form all states Endorsement.

11.2.2.2 Comprehensive General Liability:

   a. Including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations; Broad Form Property Damage; Contractual Liability; Personal Injury; all as combined single limits:

      1) General Aggregate: $2,000,000, with general aggregate of $2,000,000 applicable to this project only; including in part, Bodily Injury/Property Damage $2,000,000 each occurrence.

      2) Products/Completed Operations: $2,000,000 annual aggregate.

         Products and Completed Operations Insurance shall be maintained for three (3) years after the work has been completed; property damage liability insurance shall provide X, C, and U coverage; Fellow Employee suits shall be included.

      3) Personal and Advertising Injury: $1,000,000 per occurrence.

      4) Each Occurrence: $1,000,000.

11.2.2.3 Comprehensive Commercial Business Automobile Liability
(owned, non-owned, hired):

   a. Combined single limits for bodily injury and property damage:

      1) Bodily Injury/Property Damage $1,000,000 each occurrence.

11.2.2.4 Aircraft Liability (owned and non-owned) when applicable:

   a. Furnish proof of coverage with the following limits (combined single limits for bodily injury and property damage):

      1) Admitted liability $1,000,000 per seat.

      2) Bodily Injury/Property damage $1,000,000 each occurrence.

11.2.2.5 Commercial Umbrella Excess Liability over Primary Insurance:

   a. $4,000,000 each occurrence.
b. Products/Completed Operations: $4,000,000 aggregate.
c. General Aggregate: $4,000,000.

11.2.2.6 Indemnity:

a. The Contractor shall assume all liability for and shall indemnify and save harmless the Owners, Architect, and their consultants and employees from: All damages and liability for injury to any person or persons, and injury to or destruction of property, including the loss of use thereof, by reason of an accident or occurrence arising from operations under the Contract, whether such operations be by himself, or by any subcontractor or by anyone directly or indirectly employed by either of them, occurring on or about the premises or the ways and means immediately adjacent, during the term of the contract, or any extension thereof, and shall also assume the liability for injury and/or damages to adjacent or neighboring property by reason of work done under this Contract; The obligations of the work done under this Contract. The obligations of the contractor under this paragraph shall not extend to the liability of the Architect, his agents or employees arising out of:

1) The preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, design or specifications, or;

2) The giving or the failure to give directions or instructions by the Architect, his agents or employees, upon request, provided such giving of or failure to give is the primary cause of the injury or damage.

The insurance shall extend to and include all of the contractor's operations, regardless of whether they may be in connection with work that is temporary, permanent, included in any of the bid items or classified as extra work.

A statement of the above indemnity coverage and condition shall be included on the Insurance Certificate or Policy.

11.2.2.7 Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to signing of the Contract for the Work of this project, and along with the required 100% Performance and 100% Payment Bonds (100% of Contract amount), shall be attached to the Contract(s). These certificates shall contain a provision that policy coverage will not be changed or canceled until at least thirty (30) days prior written notice has been given the Owner and Architect, which may be reduced to at least ten (10) days for non-payment of premium only.
a. Provide copies of policies renewed, altered and/or replaced during the Work of this project, to the Owner within 10-days of their effective date(s), with copy sent to the Architect.

11.3 PROPERTY INSURANCE:

11.3.1 The Contractor shall provide an All Risk (“open perils”) Builder's Risk Policy with a replacement cost valuation, to cover the interests of all contractor's and sub-contractors of any tier. The contractor and subcontractors of any tier shall be responsible for all risks of physical loss to the work not otherwise covered, including in part, portions of the work stored off the site and in transit between off-site storage and site.

11.3.2 The total amount of the insurance shall be the amount of the contract.

11.3.3 The policy or policies shall be endorsed to waive all rights of subrogation among, between, and to each insured under the policy.

11.3.4 The “Owner, Architect, and their Consultants” shall be additionally named primary insureds under the policy or policies. Refer also to Division 1 Section “Special Conditions”, for additional information and requirements.

11.3.5 Any deductibles will be apportioned to the named insureds (but excluding those named in 11.3.4) as their interests may appear, based upon claim payments.

11.3.6 Any claims coming under the terms and conditions of the policies shall be immediately reported by written notice to the Architect, with a copy to the Owner:

Goodwyn, Mills & Cawood, Inc.
2701 First Avenue South, Suite 100
Birmingham, Alabama 35233
Phone: (205) 879-4462

11.4 PERFORMANCE AND PAYMENT BOND:

11.4.1 The Contractor and subcontractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor’s usual source, and the cost thereof shall be included in the Bid and Contract Sum. The amount of each bond shall be equal to 100-percent (100%) of the Contract Sum.

11.4.1.1 The Contractor shall deliver the required bonds to the construction manager attached to each copy of the Contract which the Contractor is presented to execute for the Work of the Project.

11.4.1.2 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the Power of Attorney.”
11. ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK:
   a. Refer to Subparagraph 12.2.2, and add the following new Subparagraphs:
      “12.2.2.1.1 For the purposes of this paragraph, “reasonable time” shall be defined as within ten (10) consecutive calendar days from and after receipt of notice from the Owner and/or Architect.”
      “12.2.2.4 Upon request by the Owner, and prior to the expiration of the expiration of one year from the date of Substantial Completion, the Architect will conduct and the Contractor shall attend a meeting with the Owner to review the facility operations and performance.”

12. ARTICLE 13 - MISCELLANEOUS PROVISIONS:
   a. Delete Subparagraph 13.6 in its entirety.

13. ARTICLE 15 - CLAIMS AND DISPUTES
   a. Refer to Subparagraph 15.1.5, and add the following new Subparagraphs:
      “15.1.5.3 Claims for increase in the Contract Time shall set forth in detail circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work, and the number of normal working days’ increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require, including where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.
      15.1.5.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.
      15.1.5.5 Refer to Division 1 Section “Special Conditions” and other applicable portions of the Bid and Contract Documents for additional information, requirements, reporting requirements, limitations and exclusions relating to claims for additional time.”
   b. Refer to Subparagraph 15.1.6, and delete this Subparagraph in its entirety.
END OF SUPPLEMENTARY CONDITIONS
FORM OF CONTRACTOR’S ROOFING GUARANTEE
(Contractor refers to General and/or Roofing Contractor, jointly and severally)

Name of Project ______________________________________________________________________________

Location ______________________________________________________________________________

Owner _____________________________________________________________________________

General Contractor __________________________ Roofer ____________________________________
Address ___________________________________ Address ___________________________________
                                                                                     ____________________________________________

EFFECTIVE DATES OF GUARANTEE:

Date of Acceptance __________________________ Date of Expiration ___________________________

A. The Contractor does hereby certify that the roofing work included in this contract was installed in strict
accordance with all requirements of the plans and specifications and in accordance with approved
roofing manufacturers recommendations.

B. The Contractor does hereby guarantee the roofing and associated work including but not limited to all
flashing and counter flashing both composition and metal; roof decking and/or sheathing; all material
used as a roof substrate or insulation over which roof is applied; promenade decks or any other work on
the surface of the roof; metal work; gravel stops and roof expansion joints to be absolutely watertight
and free from all leaks, due to faulty or defective materials and workmanship for a period of five (5)
years, starting on the date of substantial completion of the project. This guarantee does not include
liability for damage to interior contents of building due to roof leaks, nor does it extend to any
deficiency which was caused by the failure of work which the Contractor did not damage or did not
accomplish or was not charged to accomplish.

C. Subject to the terms and conditions listed below, the Contractor also guarantees that during the
Guarantee Period he will, at his own cost and expense, make or cause to be made such repairs to, or
replacements of said work, in accordance with the roofing manufacturers recommendations as are
necessary to correct faulty and defective work and/or materials which may develop in the work
including, but not limited to: blisters, delamination, exposed felts, ridges, wrinkles, splits, warped
insulation and/or loose flashing, etc. in a manner pursuant to the total anticipated life of the roofing
system and the best standards applicable to the particular roof type in value and in accordance with
construction documents as are necessary to maintain said work in watertight conditions, and further, to
respond on or within three (3) calendar days upon proper notification of leaks or defects by the Owner
or Architect.

1. Specifically excluded from this Guarantee are damages to the work, other parts of the building
and building contents caused by: (1) lightning, windstorm, hailstorm and other unusual
phenomena of the elements; and (2) fire. When the work has been damaged by any of the
foregoing causes, the Guarantee shall be null and void until such damage has been repaired by
the Contractor, and until the cost and expense thereof has been paid by the Owner or by the
responsible party so designated.
2. During the Guarantee Period, if the Owner allows alternation of the work by anyone other than the Contractor including cutting, patching and maintenance in connection with penetrations, and positioning of anything on the roof, this Guarantee shall become null and void upon the date of said alterations. If the Owner engages the Contractor to perform said alterations, the Guarantee shall not become null and void, unless the Contractor, prior to proceeding with said work, shall have notified the Owner in writing, showing reasonable cause for claim that said alterations would likely damage or deteriorate the work, thereby reasonably justifying a termination of this Guarantee.

3. Future building additions will not void this guarantee, except for that portion of the future addition that might affect the work under this contract at the point of connection of the roof areas, and any damage caused by such addition. If this contract is for roofing of an addition to an existing building, then this guarantee covers the work involved at the point of connection with the existing roof.

4. During the Guarantee Period, if the original use of the roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray cooled surface, flooded basin, or other use of service more severe than originally specified, this Guarantee shall become null and void upon the date of said change.

5. The Owner shall promptly notify the Contractor of observed, known or suspected leaks, defects or deterioration, and shall afford reasonable opportunity for the Contractor to inspect the work, and to examine the evidence of such leaks, defects or deterioration.

D. Standard manufacturer’s roofing guarantees which contain language regarding the governing of the guarantee by any state other than the state of Alabama, must be amended to exclude such language, and shall substitute the requirement that the Laws of the State of Alabama shall govern all such guarantees.

IN WITNESS THEREOF, this instrument has been duly executed this ______ day of __________________, 20____.

________________________________________
General Contractor's Authorized Signature

________________________________________
Roofing Contractor's Authorized Signature

________________________________________
Typed Name and Title

________________________________________
Typed Name and Title
APPLICATION AND CERTIFICATE FOR PAYMENT FORM

1.1 Application for Payment shall be executed on AIA Document G702 Contractor’s Application for Payment, along with AIA Document G703 Continuation Sheet. A draft copy is attached for reference. Copies of G702 and G703 are available for viewing in the office of the Architect, and may be purchased from an AIA documents vendor by the Contractor.

END OF APPLICATION AND CERTIFICATE FOR PAYMENT FORM
Application and Certificate for Payment

TO OWNER:  
FROM CONTRACTOR:  
PROJECT:  
ARCHITECT:  
VIA CONTRACT DATE:  
APPLICATION NO:  
PERIOD TO:  
CONTRACT FOR:  
CONTRACTOR:  
FIELD:  
OWNER:  
ARCHITECT:  
FIELD:  
STATE:  
COUNTY:  

CONTRACTOR’S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.  

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

CHANGE ORDER SUMMARY  

<table>
<thead>
<tr>
<th></th>
<th>ADDITIONS</th>
<th>DEDUCTIONS</th>
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<tbody>
<tr>
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<td>$0.00</td>
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<tr>
<td></td>
<td><strong>TOTALS</strong></td>
<td><strong>$0.00</strong></td>
</tr>
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</table>

AMOUNT CERTIFIED: $0.00  
(Attach explanation if amount certified differs from the amount applied.  Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:  

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

By:  

ARCHITECT’S CERTIFICATE FOR PAYMENT

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

AMOUNT CERTIFIED: $0.00  
(Attach explanation if amount certified differs from the amount applied.  Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:  

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

**PROJECT:** LIMESTONE COUNTY TEMP. COURTHOUSE  
LINCOLN COUNTY  
ATHENS, ALABAMA

**PROJECT NO.:** ABHM130022

**CONTRACTOR:**  
ARCHITECT: GOODWYN, MILLS & CAWOOD, INC.  
2701 1ST Ave., S., Suite 100  
Birmingham, Alabama 35233

**DATE OF REPORT:**  
**PROCEED DATE:**  
**PROJECTED COMPLETION DATE:**

<table>
<thead>
<tr>
<th>WORK DIVISION</th>
<th>%</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. GENERAL REQUIREMENTS</td>
<td></td>
<td></td>
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<tr>
<td>2. SITEWORK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. CONCRETE</td>
<td></td>
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<tr>
<td>4. MASONRY</td>
<td></td>
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<tr>
<td>5. METALS</td>
<td></td>
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</tr>
<tr>
<td>6. WOOD AND PLASTICS</td>
<td>-----90%</td>
<td></td>
</tr>
<tr>
<td>7. THERMAL AND MOISTURE PROTECTION</td>
<td>-----80%</td>
<td></td>
</tr>
<tr>
<td>8. DOORS AND WINDOWS</td>
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<td>9. FINISHES</td>
<td>-----60%</td>
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</tr>
<tr>
<td>10. SPECIALTIES</td>
<td>-----50%</td>
<td></td>
</tr>
<tr>
<td>11. EQUIPMENT</td>
<td>-----40%</td>
<td></td>
</tr>
<tr>
<td>12. FURNISHINGS</td>
<td>-----30%</td>
<td></td>
</tr>
<tr>
<td>13. SPECIAL CONSTRUCTION</td>
<td>-----20%</td>
<td></td>
</tr>
<tr>
<td>14. CONVEYING SYSTEMS</td>
<td>-----10%</td>
<td></td>
</tr>
<tr>
<td>15. MECHANICAL</td>
<td>-----0%</td>
<td></td>
</tr>
<tr>
<td>16. ELECTRICAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL ORIGINAL CONTRACT</strong></td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

**ANTICIPATED DRAW IN $1,000's**

**ACTUAL DRAW IN $1,000's**

**USE ADDITIONAL SHEET IF JOB IS SCHEDULED MORE THAN 12 MONTHS**

**LEGEND:**  
ANTICIPATED ACTIVITY  
ACTUAL ACTIVITY  
ANTICIPATED CASH FLOW  
ACTUAL CASH FLOW
1.1 Changes to the Contract shall be made using AIA Document G701 Change Order. A draft copy is attached for reference. Copies of G701 are available for viewing in the office of the Architect, and may be purchased from an AIA documents vendor by the Contractor.
Change Order

PROJECT (Name and address): 

CHANGE ORDER NUMBER: 001

DATE:

OWNER: 

ARCHITECT:

TO CONTRACTOR (Name and address):

ARCHITECT'S PROJECT NUMBER:

ARCHITECT'S PROJECT NUMBER:

ARCHITECT:

CONTRACTOR:

ARCHITECT'S PROJECT NUMBER:

ARCHITECT:

CONTRACTOR:

CONTRACT DATE:

FIELD:

OTHER:

CONTRACT FOR: General Construction

CONTRACT FOR: General Construction

THE CONTRACT IS CHANGED AS FOLLOWS:

(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)

The original Contract Sum was

The net change by previously authorized Change Orders

The Contract Sum prior to this Change Order was

The Contract Sum will be increased by this Change Order in the amount of

The new Contract Sum including this Change Order will be

The Contract Time will be increased by Zero (0) days.

The date of Substantial Completion as of the date of this Change Order therefore is

NOTE: This Change Order does not include changes in the Contract Sum, Contract Time or Guaranteed Maximum Price which have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT (Firm name) 

CONTRACTOR (Firm name)

OWNER (Firm name)

ADDRESS

ADDRESS

ADDRESS

BY (Signature)

BY (Signature)

BY (Signature)

(Typed name)

(Typed name)

(Typed name)

DATE

DATE

DATE
1.1 Certificate of Substantial Completion shall be executed using AIA Document G704 Certificate of Substantial Completion. A draft copy is attached for reference. Copies of G704 are available for viewing in the office of the Architect, and may be purchased from an AIA documents vendor by the Contractor.

END OF CERTIFICATE OF SUBSTANTIAL COMPLETION FORM
**Certificate of Substantial Completion**

**PROJECT:**
*(Name and address):*
0414 Ardmore High Feild House

**PROJECT NUMBER:**
/

**CONTRACT FOR:** General Construction

**CONTRACT DATE:**

**OWNER:**

**ARCHITECT:**

**CONTRACTOR:**

**FIELD:**

**OTHER:**

**TO OWNER:**
*(Name and address):*

**TO CONTRACTOR:**
*(Name and address):*

**PROJECT OR PORTION OF THE PROJECT DESIGNATED FOR PARTIAL OCCUPANCY OR USE SHALL INCLUDE:**

The Work performed under this Contract has been reviewed and found, to the Architect’s best knowledge, information and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated above is the date of issuance established by this Certificate, which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

<table>
<thead>
<tr>
<th>Warranty</th>
<th>Date of Commencement</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCHITECT</td>
<td>BY DATE OF ISSUANCE</td>
</tr>
</tbody>
</table>

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment.

**Cost estimate of Work that is incomplete or defective:** $0.00

The Contractor will complete or correct the Work on the list of items attached hereto within Zero (0) days from the above date of Substantial Completion.

<table>
<thead>
<tr>
<th>CONTRACTOR</th>
<th>BY DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Owner accepts the Work or designated portion as substantially complete and will assume full possession at <em>(date).</em></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OWNER</th>
<th>BY DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance shall be as follows: <em>(Note: Owner’s and Contractor’s legal and insurance counsel should determine and review insurance requirements and coverage.)</em></td>
<td></td>
</tr>
</tbody>
</table>
ADVERTISEMENT FOR COMPLETION FORM

LEGAL NOTICE

In accordance with Chapter 1, Title 39, Code of Alabama, 1975, as amended, notice is hereby given that

______________________________________________________________

(Name of Contractor)

has completed the Contract for Construction of

______________________________________________________________

(Name of Project)

______________________________________________________________

(Insert location data in County or City)

for the ________________________________, Owner(s), and have made request for final settlement of said Contract. All persons having any claim for labor, materials, or otherwise in connection with this project should immediately notify

GOODWYN, MILLS AND CAWOOD, INC.
2701 1st Avenue South, Suite 100
Birmingham, Alabama 35233
(Architect)

__________________________________________

(Name of Contractor)

__________________________________________

(Business Address)

__________________________________________

NOTE: This notice must be run once a week for four successive weeks in the County where the project is located for projects exceeding $50,000.00. For projects of less than $50,000.00, run one time only. Proof of publication is required, by submittal of certified ad copy in duplicate.
State of Alabama
Disclosure Statement
(Required by Act 2001-955)

ENTITY COMPLETING FORM

ADDRESS

CITY, STATE, ZIP

TELEPHONE NUMBER

STATE AGENCY/DEPARTMENT THAT WILL RECEIVE GOODS, SERVICES, OR IS RESPONSIBLE FOR GRANT AWARD

ADDRESS

CITY, STATE, ZIP

TELEPHONE NUMBER

This form is provided with:

☐ Contract ☐ Proposal ☐ Request for Proposal ☐ Invitation to Bid ☐ Grant Proposal

Have you or any of your partners, divisions, or any related business units previously performed work or provided goods to any State Agency/Department in the current or last fiscal year?

☐ Yes ☐ No

If yes, identify below the State Agency/Department that received the goods or services, the type(s) of goods or services previously provided, and the amount received for the provision of such goods or services.

<table>
<thead>
<tr>
<th>STATE AGENCY/DEPARTMENT</th>
<th>TYPE OF GOODS/SERVICES</th>
<th>AMOUNT RECEIVED</th>
</tr>
</thead>
</table>

Have you or any of your partners, divisions, or any related business units previously applied and received any grants from any State Agency/Department in the current or last fiscal year?

☐ Yes ☐ No

If yes, identify the State Agency/Department that awarded the grant, the date such grant was awarded, and the amount of the grant.

<table>
<thead>
<tr>
<th>STATE AGENCY/DEPARTMENT</th>
<th>DATE GRANT AWARDED</th>
<th>AMOUNT OF GRANT</th>
</tr>
</thead>
</table>

1. List below the name(s) and address(es) of all public officials/public employees with whom you, members of your immediate family, or any of your employees have a family relationship and who may directly personally benefit financially from the proposed transaction. Identify the State Department/Agency for which the public officials/public employees work. (Attach additional sheets if necessary.)

<table>
<thead>
<tr>
<th>NAME OF PUBLIC OFFICIAL/EMPLOYEE</th>
<th>ADDRESS</th>
<th>STATE DEPARTMENT/AGENCY</th>
</tr>
</thead>
</table>

OVER
2. List below the name(s) and address(es) of all family members of public officials/public employees with whom you, members of your immediate family, or any of your employees have a family relationship and who may directly personally benefit financially from the proposed transaction. Identify the public officials/public employees and State Department/Agency for which the public officials/public employees work. (Attach additional sheets if necessary.)

<table>
<thead>
<tr>
<th>NAME OF FAMILY MEMBER</th>
<th>ADDRESS</th>
<th>NAME OF PUBLIC OFFICIAL/ PUBLIC EMPLOYEE</th>
<th>STATE DEPARTMENT/ AGENCY WHERE EMPLOYED</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

If you identified individuals in items one and/or two above, describe in detail below the direct financial benefit to be gained by the public officials, public employees, and/or their family members as the result of the contract, proposal, request for proposal, invitation to bid, or grant proposal. (Attach additional sheets if necessary.)

Describe in detail below any indirect financial benefits to be gained by any public official, public employee, and/or family members of the public official or public employee as the result of the contract, proposal, request for proposal, invitation to bid, or grant proposal. (Attach additional sheets if necessary.)

List below the name(s) and address(es) of all paid consultants and/or lobbyists utilized to obtain the contract, proposal, request for proposal, invitation to bid, or grant proposal:

<table>
<thead>
<tr>
<th>NAME OF PAID CONSULTANT/ LOBBYST</th>
<th>ADDRESS</th>
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</table>

By signing below, I certify under oath and penalty of perjury that all statements on or attached to this form are true and correct to the best of my knowledge. I further understand that a civil penalty of ten percent (10%) of the amount of the transaction, not to exceed $10,000.00, is applied for knowingly providing incorrect or misleading information.

Signature Date

Notary’s Signature Date Date Notary Expires

Act 2001-955 requires the disclosure statement to be completed and filed with all proposals, bids, contracts, or grant proposals to the State of Alabama in excess of $5,000.
SECTION 01015
SPECIAL CONDITIONS

1.01 TIME FOR COMPLETION OF WORK:
   A. The Contractor may proceed to award sub-contracts, assemble materials, etc., at any time after award
      of Contract and “Notice To Proceed” with Work is given by the Owner. The Contractor’s official
      time for construction to start on work shall be the earlier of either the date of the Owner’s “Notice to
      Proceed” with Work or receipt of the fully executed Contract for the Work; and completion of the
      Work shall be within the number of consecutive calendar days or by the date(s) indicated on the
      Contractor’s Proposal Form.
   1. Properly supervised work, per requirements, will be permitted on Saturdays and Sundays.
   B. Acceptance of the completed Work of this Contract will be at a single date, and not in phases, unless
      otherwise indicated.
   C. Nothing in the Contract Documents shall permit or be construed to permit payment to the Contractor
      for any extended overhead or profit due to completion of the project extending beyond the
      Contractual completion date. In no event shall the Owner or Architect be liable to the Contractor for
      damage due to any delay to any portion of the Work of this Contract.
   D. Delays due to inclement weather will be considered, only if the rain amount per month, is in excess of
      the National Weather Service 5-year average for this project’s location, and proof of same is
      submitted along with any such claim.
   1. On-site records of daily rain and/or temperature readings kept by the Contractor may be
      accepted to verify weather and/or temperature variations which prevent earthwork, foundations
      and slabs, and/or roofing materials installation.

1.02 LIQUIDATED DAMAGES:
   A. Actual damages for delay in completion may be impossible to determine, and the Contractor shall be
      liable for and the Owner shall deduct as liquidated damages from the final payment due the
      Contractor, the following, in addition to 6% per annum of the total contract amount:
   1. For each calendar day of delay in completion of any part of the work beyond the number of days
      specified, the sum of $250.00.
   2. In the event that work on this project is incomplete and ongoing after the contractual completion
      date, beginning at ten (10) additional days thereafter, the Owner will also charge the Contractor,
      an additional $250.00 per day, for the Owner’s nominal reimbursement to the Architect for
      continued work on the project, which charges will continue until “Substantial Completion” is
      accomplished.
   B. The submittal of a Bid and/or Proposal by any Contractor and their Subcontractors shall be construed
      as, in part, acknowledgement and acceptance of these provisions.

1.03 SITE RESTRICTIONS:
   A. The limits of work and known restrictions are indicated on the Site Plan and various portions of the
      Drawings and the Project Manual.
   1. Refer also to Section 01100 - “Summary of The Work,” for additional information and
      requirements.
1.04 PRE-BID CONFERENCE:
   A. Refer to “Advertisement for Prequalification and Bids” and “Supplementary Instructions to Bidders,” for additional information and requirements.

1.05 PRE-CONSTRUCTION CONFERENCES:
   A. Prior to commencing any work on the project, a pre-construction conference shall be held. Mandatory attendance will be required of the General Contractor and representative of all specialty and principal subcontractors involved in the project. Time and date of said conference shall be established by the Architect after award of construction contract.

   B. Similarly, prior to commencing any major portion of the Work of the project, preconstruction conferences shall be held. Mandatory attendance will be required of the General Contractor and representative of all specialty and principal subcontractors involved in the individual major portions of project. Time and date of said conferences shall be established by the General Contractor, and the Architect, Owner, and appropriate Consultants shall be advised in writing of times and dates, by the General Contractor.
      1. “Major portion” may be defined as work items for each Subcontractor working on site, and shall include in part, but not be limited to, earthwork, sitework, site utilities, concrete work, masonry, Division 5, roof framing and Division 6, insulation, roofing systems, finishes, specialties, casework, mechanical, plumbing, and electrical.

   C. Refer to Section 01300 - "Administrative Requirements" for additional information and requirements.

1.06 PRE-ROOFING CONFERENCE:
   A. A pre-roofing conference is required before any roofing materials are installed. This conference shall be conducted by a representative of the Architect and attended by representatives of the Owner, General Contractor, Roofing Contractor, Sheet Metal Contractor, Roof Deck Manufacturer (if applicable) and the Roofing Materials Manufacturer (if warranty is required of this manufacturer). If equipment of substantial size is to be placed on the roof, the Mechanical Contractor must also attend this meeting.

   B. The pre-roofing conference is intended to clarify demolition (for renovation or re-roofing projects) and application requirements for work to be completed before roofing operations can begin. This would include a detailed review of the specifications, roof plans, roof deck information, flashing details and approved shop drawings, submittal data, and samples. If conflict exists between the specifications and the Manufacturer's requirements, this shall be resolved. If this pre-roofing conference cannot be satisfactorily concluded without further inspection and investigation by any of the parties present, it shall be reconvened at the earliest possible time to avoid delay of the work. In no case should the work proceed without inspection of all roof deck areas and substantial agreement on all points.

   C. The following are to be accomplished during the conference:
      1. Review all Factory Mutual and Underwriters Laboratories requirements listed in the specifications and resolve any questions or conflicts that may arise.
      2. Establish trade-related job schedules, including the installation of roof-mounted mechanical equipment.
      3. Establish roofing schedule and work methods that will prevent roof damage.
      4. Require that all roof penetrations and walls be in place prior to installing the roof.
5. Establish those areas on the job site that will be designated as work and storage areas for roofing operations.
6. Establish weather and working temperature conditions to which all parties must agree.
7. Establish acceptable methods of protecting the finished roof if any trades must travel across or work on or above any areas of the finished roof.

D. The Architect shall prepare a written report indicating actions taken and decisions made at this pre-roofing conference. This report shall be made a part of the project record and copies furnished the General Contractor, and the Owner.

E. Refer to Section 01300 - "Administrative Requirements" for additional information and requirements.

1.07 CONTRACTOR ACCESS TO SITE:

A. The Contractor will have access to the site immediately upon issuance of Notice to Proceed with work. All routes of access to the site and gate locations by the Contractor or their subcontractors, are subject to approval by Owner, Architect, and other authorities having jurisdiction. Check site plan for location of work limits. Refer to Section 01100 - “Summary of The Work” and Section 01500 - “Temporary Facilities,” for additional information and requirements.

B. The Contractor shall be required to coordinate the Work of the project with the Owner’s activities, to the extent that the Work of this Contract has little or no effect on normal operations.

1.08 CONTRACTOR’S PLAN FOR CONSTRUCTION OF PROJECT:

A. Contractor shall prepare and submit within 7 days from award of contract to the Architect for review and approval a Bar Graph, indicating his proposed plan and sequence of operations to complete each phase of this project, on schedule as required by contract. This Bar Graph is not expected to be a Critical Path graph.

1. Schedule should identify project milestones and expected durations.

1.09 CONTRACTOR JOB MEETINGS:

A. On-Site Meetings with Architect, and various trades, general contractors and subcontractors, shall be conducted by the Contractor as directed by the Architect for purpose of furthering the progress of the work, solving construction problems, and issuing instructions.

B. Refer to “Pre-construction Conferences” paragraph above, “General Conditions of the Contract”, and Section 01300 - "Administrative Requirements" for additional information and requirements.

1.10 STORED MATERIALS:

A. It is recognized that the size of the site is restrictive and that it may be necessary for the Contractor to store some materials for project at locations on the site, prior to removal or disposal. When such on site storage is necessary, comply with requirements of authorities having jurisdiction, including in part, on site retention of earth, storm water run-off, slopes of debris, earth, etc.

B. Store items to be incorporated in the Work in stable and secure manner, off of ground, separated by hardwood or treated wood blocking, and under cover or in storage building.

1. Any materials found stored directly on ground or paving, in standing water, etc., will be rejected, immediately removed from site, and replaced with new materials at the Contractor’s expense.

2. Distribute materials around framing and the roof in such manner as to prevent any damage to structure, construction, improvements, etc.

C. Refer to Section 01600 - “Product Requirements”, for additional information and requirements for any off-site stored materials.
1.11 PROTECTION:
A. The Contractor shall provide and maintain adequate fencing and barricades, where indicated, and wherever required. Building entrances and exits shall remain unobstructed at all times when buildings are occupied.
B. The Contractor shall provide suitable protection for all employees, the public, students, children, users of other adjacent facilities, and the occupants of existing buildings at all times during the execution of and until the completion of the Work.
   1. Construction equipment shall not come in contact with or swing over existing facilities to remain, public areas, occupied buildings, right-of-ways, etc., which are to remain.
C. The Contractor shall avoid damage as a result of their operations, to the existing buildings, walks, pavement, curbs, grass, shrubbery, trees, utilities, adjoining property, etc., and shall at his/her own expense, completely repair any damage thereto caused by his operations. All repair work is subject to Architect’s approval, and that of its Owner.
D. Refer to Section 01500 - "Temporary Facilities and Controls" for additional information and requirements.

1.12 WORK LIMITS PROTECTION:
A. The Contractor shall locate all temporary buildings, storage of equipment, materials, etc., within a protected area to protect the public, students, children, and others from the construction activities. Type and location of such protection shall be as existing at the site, or if not existing or complete, as proposed and furnished by the Contractor, subject to acceptance of the Architect, Owner, and authorities having jurisdiction.
B. Refer to Section 01500 - "Temporary Facilities and Controls" for additional information and requirements.

1.13 EMPLOYMENT OF AND PAYMENT FOR TESTING SERVICES:
A. The following information regarding Employment of and Payment for Testing Services under the work of Specifications shall take precedence over any conflicting statements otherwise, which may have remained in the Project Manual after editing:
   1. Initial testing required by the Contract Documents for Divisions 2 through 5 (except not utility systems testing) shall be provided by an independent testing agency selected, employed and paid by the Owner.
   2. Initial testing required by the Contract Documents for all other testing and Divisions 6 through 16 shall be provided by a testing agency acceptable to the Owner, and selected, employed, and paid by the Contractor from his/her Contract amount.
   3. Any retesting required (due to failure of initial testing to meet the requirements of the Contract Documents) shall be at the Contractor’s expense.
   4. Any retesting required (due to questionable materials or construction methods, for verification purposes, and etc.) shall be at the Contractor’s expense when the results of such retesting indicate any work or materials do not comply with requirements of the Contract Documents. Otherwise, such retesting will be at Owner’s expense.
   5. Any retesting under the above provisions shall be performed by the same Owner accepted testing agency.
   6. Nothing in the Contract Documents shall prevent the Contractor from performing any other or additional Quality Control testing at his/her own expense, to verify compliance with the Bid and Contract Documents.
B. The Contractor shall be responsible for contacting and directions to the accepted testing agency and for any follow-up communications required, for all testing required by the Contract Documents.

C. No unsuitable or unsatisfactory existing soils or building materials (other than work in Contract) shall be removed without either the presence of or concurrence of and prior approval of the Architect and the accepted testing agency, so as to assure quality of the Work is maintained, and to verify quantities of any additional work under bid “Unit Prices”, for which the Contractor is due payment by the Owner.

D. The Contractor shall be responsible for contacting and directions to the accepted testing agency and for any follow-up communications required, for all testing required by the Contract Documents.

E. Refer to Section 01400 - "Quality Requirements" for additional information and requirements.

1.14 PROHIBITED MATERIALS:

A. ASBESTOS: All materials, equipment, components, accessories, and etc., installed in the work of this contract, both field installed and bought-out manufactured items from any source shall be 100-percent free of asbestos.

B. LEAD CONTENT: All water-bearing lines, water dispensing equipment, finish materials, and paint other than exposed exterior roof flashings, shall be 100-percent free of lead.

C. CALCIUM CHLORIDE: Calcium chloride and/or derivatives or additives thereof shall not be permitted in any concrete, concrete product, grout, masonry and/or mortar.

D. ENVIRONMENTAL REGULATIONS: All materials, their application, installation, and completion, shall comply with applicable environmental regulations, including in part, erosion, air-borne contaminants, and volatile organic compounds (VOC’s).

E. FORMALDEHYDE: All insulation and other products shall be 100-percent free of formaldehyde.

1.15 PROHIBITED EQUIPMENT:

A. The elevated and framed floor slabs are not designed to accommodate heavy rolling point loads. Scissor lifts are not permitted on any elevated or framed slab during the construction of the project.

1.16 PROJECT SIGNS:

A. Maintain existing PROJECT SIGN, as per Detail following Section 01585 - Project Signs, at location on site as directed by the Owner or Architect. Any statements elsewhere which may omit Project Sign are hereby not withstanding.

1. Sign shall be in place within ten days from and including the day after date of Owner’s “Notice to Proceed,” and shall be removed within five days of the date all work on this project has been completed.

B. Provide, securely install and maintain prefinished metal signs on each side of each gate leaf and at 50’-0” o.c. maximum on street/public side of all construction fencing provided (if any).

1. Copy: “NO TRESPASSING
DANGER
CONSTRUCTION AREA”

2. Size: Approximately 1’-6” wide x 1’-0” high.

C. Provide other pedestrian and vehicular signs as necessary and required, in compliance with requirements of authorities having jurisdiction. Signs shall remain on site for duration of this Contract.
D. General Contractor may have a sign on his/her Construction Office and as needed for delivery directions only.
E. Subcontractors will not be allowed to post signs.
F. Refer to Section 01585 - "Project Signs" for additional information and requirements.

1.17 PERSONNEL EXPERIENCE AND SUPERINTENDENTS:
A. Subcontractors shall have no less than 5-years verifiable experience in their trade and no less than 5-years verifiable experience in their business enterprise contracting for work under this project; The type of work subcontracted for this project shall be the principal business of the Subcontractor.
B. Superintendents and foremen, or other individual in the lead or supervisory position for any portion of the Work under this Contract shall have no less than 7-years verifiable experience in performing the type of work they are responsible for.
   1. The Contractor shall submit resumes of work and project experience for their Superintendent and foremen, as soon as possible and at least within five calendar days of receipt of the Contract to be executed for the work, for review and acceptance by the Owner and Architect.
   2. If the Superintendent is replaced on the job after work begins, the same qualifications as above apply. Submit for review and acceptance by the Owner and Architect.

1.18 SUBMITTALS:
A. Submittal requirements are indicated throughout the Contract Documents, and the following supplements those requirements.
   1. Contractor will be required to make submittals for every item and product so indicated; Also upon request, for any additional or other item or products intended for use or incorporation in the Work.
      a. The Contractor shall submit to the Architect within 30 days of “Notice to Proceed”, a complete listing of all required submittals, warranties, guarantees, close-out documents, and materials requiring extra or “attic” stock delivered to the Owner, for review and acceptance. Include for each item, the anticipated date of Submittal to the Architect. Re-submit until accepted or approved.
   2. The Contractor shall review, mark all necessary changes, revisions, and questions; and then stamp, sign, approve, and submit to the Architect, all Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, and shall do so 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.
      a. The Contractor shall not make submittals to the Architect which they have not reviewed, stamped, signed and approved by the Contractor; or in such case, no action will be taken by the Architect or their Consultants regarding that or those submittals.
   3. The Contractor shall submit number of copies for review as indicated in Section 01300 - Administrative Requirements.
   4. Review time will be limited to two weeks, except for more complex submittals, such as Structural, Division 15 and Division 16.
   5. Colors will not be selected until most or all submittals required have been received and reviewed.
   6. Samples: Submit the number specified in Section 01300.
   7. Submit test reports as required or otherwise requested, in the same quantity as other submittal data.
8. Contractor shall provide letter from Mechanical Contractor stating the Mechanical Contractor has coordinated all power requirements with the Electrical Contractor. Mechanical submittals will not be reviewed without receipt of this letter.

9. Contractor shall distribute reviewed submittals to all concerned and appropriate Subcontractors and Suppliers.

10. Contractor shall maintain 1-set of reviewed submittals at his on-site job office.

B. Review and/or approval of submittals by the Architect, Owner and/or their Consultants shall not relieve the Contractor of his responsibility to comply with the requirements of the Contract Documents.

1. Any proposed change in the Work shall be submitted separate from any other item during construction, with same documentation as pre-bid requests, or they will not be considered.

2. No actual or proposed change shall be included in Shop Drawings or other Construction submittals, and none so included will be considered approved under any circumstances.

3. Shop Drawings are communications between the Contractor and various suppliers, fabricators, and subcontractors. The design professional’s role is to review the drawings to answer questions that arise about design intent.

4. Even if a reviewed Shop Drawing or other Submittal has deviations from the original design and the Contract Documents, it in itself is not a Change Order and it is not, IN ITSELF, an approval of the change. Changes can only be approved by Change Order.

5. Dimensions, quantities, and coordination remain the Contractor’s responsibility.

C. Refer to Section 01300 - "Administrative Requirements" for additional information and requirements.

1.19 SUBSTITUTIONS, PRE-BID QUALIFICATIONS AND PRE-QUALIFIED SUPPLIERS:

A. Substitution Procedures as stated in "Instructions To Bidders", and in Section 01600 - "Product Requirements" apply as if set forth in this Section.

1.20 SITE MAINTENANCE:

A. The Owner will require all mud or debris resulting from this construction to be removed from streets, sidewalks, etc., by the Contractor as it appears, one or more times daily.

B. Trash, debris, etc., must be removed from the site as Contractor’s trash cans, waste receptacles, etc., are filled. Same will not be allowed to accumulate or blow around the site, within the buildings, etc.

C. The Contractor shall be responsible for maintaining existing landscaping and lawns within and below any construction fencing, for the duration of the Work of the Contract, or until any such fencing is removed.

D. Refer to Sections 01100, 01500, 01700 and other locations in the Bid and Contract Documents for additional information and requirements.

1.21 INSURANCE AND SPECIAL PROVISIONS:

A. The Contractor and their insurer, by execution of the Contract, shall waive all rights of subrogation against “the Owner, the Architect, and their Consultants”, and same shall be indicated on all insurance provided by the Contractor and each Subcontractor.

B. The Contractor and their insurer, and each Subcontractor, shall name “the Owner, Architect, and their Consultants”, as additional named primary insureds on all insurance provided by the Contractor and each Subcontractor, except not for “Workers Compensation and Employers Liability”.
C. Refer to “General Conditions” and other portions of the Bid and Contract Documents, for additional information and insurance requirements. Note that Builder’s Risk insurance is required, as described in “General Conditions”.
   1. Extent of coverage required and/or any approval or acceptance of the insurance carried shall not act to modify the liability of the Contractor, nor to imply that the limits, features and/or coverages described are adequate to protect the interests or exposures of the Contractor.

D. The Contractor shall “hold harmless” and indemnify the Owner, Architect, and their Consultants from any claim or legal action resulting from any circumstances related to the Work of this project, including in part, payment of any legal or other expenses, fines, judgments, etc.

E. Insurance policies required by the Contract Documents shall not be canceled, altered, or changed, without first having given thirty (30) days written notice to the Owner, with a copy sent to the Architect, except ten(10) days written notice for non-payment of premium.
   1. Copies of all policies, endorsements, and insurance certificates, including new, renewed, altered, and/or changed during this Contract shall be delivered to the Owner within ten (10) days of effective date(s), with a copy sent to the Architect, by the Contractor.

F. Refer to General Conditions of the Contract for additional information and requirements regarding minimum insurance and indemnity requirements.

G. Special Provision: Nothing in this or other paragraphs of the Contract Documents shall create or give to third parties any claim or right of action beyond such as may legally exist irrespective of the Contract.

1.22 ACCESSIBILITY OF ALL COMPLETED WORK:

A. All products and installations of the Work of this Contract, shall be as designed by the fabricator, manufacturer, etc., and installed by the Contractor, Subcontractors, etc., so as to provide full accessibility to the handicapped and/or disabled, unless specifically indicated otherwise. This shall include in part, the following:
   1. Mounting heights of all electrical devices, switches, etc., all designated plumbing fixtures, and their operation, in all areas except mechanical and electrical rooms, and service areas which are not accessible at any time to the public or Owner’s administrative (not service or maintenance) personnel.
   2. Signage.
   3. Door operation and hardware.
   4. Elevator (if any).
   5. Slip resistance of all completed flooring and walkway surfaces both interior and exterior.

B. Comply with the more stringent requirements of at least the following, either the latest edition or latest adopted edition of the locality, and all revisions and amendments thereto:
   1. Uniform Federal Accessibility Standards (UFAS).
   2. Americans With Disabilities Act of 1990 (ADA) “Accessibility Guidelines” (ADA-AG), and all revisions and amendments thereto.
   5. International Building Code, as applicable at the project locale.
1.23 CONTRACTOR PROGRAMS AND CONDUCT OF PERSONNEL:

A. The Contractor shall implement programs and make literature available to all construction and administration personnel to encourage making this project a safe place to work, including in part the following requirements: A project site free of any substance abuse, which does not allow any consumption of alcohol, and which does not allow any work to be performed while under the influence of any debilitating substance.

1. The Contractor and every Subcontractor shall have as part of their personnel, safety, substance abuse prevention, and/or quality programs, mandatory drug testing at pre-employment, post-accident, and at random during employees’ tenure with their firms. Each such entity shall be prepared to provide non-confidential verification to the Owner that such testing is consistently on-going, upon Owner’s request for same.

B. Programs shall be as acceptable to or recommended by one or more of the following:

1. Contractor’s Underwriter for Worker’s Compensation or liability insurance.
2. OSHA.
3. Associated General Contractors.

C. Conduct of all personnel employed for the Work of this project shall be held to a high standard and shall not be offensive to others on or around the site, including in part, pedestrians, the public, the Owner, Owner’s Consultants, etc.

1. The Contractor and their employees shall limit any discussion of the Work of this project to the Owner’s representative named in the front of this Project Manual, inspecting authorities with jurisdiction, and the Architect; In no instance shall this project be discussed with others, except as may otherwise be indicated herein.

2. The Contractor’s personnel and Subcontractors shall not enter the Owner’s building, nor use the Owner’s telephones (except in emergencies), or the Owner’s restrooms.

D. The Contractor shall immediately dismiss and escort off of the project site, any personnel who are obviously under the influence of alcohol or other debilitating substance, and any personnel exhibiting offensive behavior as described above or by law or by local statute or regulations of authorities having jurisdiction.

1.24 WORK BY OTHERS:

A. The following items of work are to be provided by others, and are Not in Contract (N.I.C.). The Contractor will be required to coordinate with the Owner as necessary to accommodate provisions for these items.

1. Movable furniture, furnishings, office equipment, library equipment, and movable library shelving unless otherwise indicated.

2. Listed Equipment, residential appliances, and items of Alternate work not accepted at this time, and/or indicated “Not In Contract”, “N.I.C.”, “Future”, and/or similar indication.
   a. Unless otherwise indicated, coordination, locating, and providing rough-ins for all power, water supply, gas, drains, drain lines, condensate drain outlet, and other utilities required for such equipment, casework, etc., and preparation required for the addition of future finishes (same as level of finish required for the finishes included in Bid, just prior to finishes being added), shall be included in Base Bid;
1.25 SELECTIVE DEMOLITION:

   A. Section 02225 - “Demolition,” is applicable to the entire Work of this project and not just to Division 2 where it occurs.

END OF SECTION 01015
SECTION 01095
REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

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

1.02 DEFINITIONS:
A. General: Basic Contract definitions are included in the Conditions of the Contract.
B. Indicated: The term “indicated” refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Where terms such as “shown,” “noted,” “scheduled,” and “specified” are used, it is to help the reader locate the reference; no limitation on location is intended.
C. Directed: Terms such as “directed,” “requested,” “authorized,” “selected,” “approved,” “required,” and “permitted” mean “directed by the Architect,” “requested by the Architect,” and similar phrases.
D. Approve: The term “approved,” where used in conjunction with the Architect’s action on the Contractor’s submittals, applications, and requests, is limited to the Architect’s duties and responsibilities as stated in the Conditions of the Contract.
E. Regulation: The term “Regulations” includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
F. Furnish: The term “furnish” is used to mean “supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.”
G. Install: The term “install” is used to describe operations at project site including the actual “unloading, temporary storage, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.”
H. Provide: The term “provide” means “to furnish and install, complete and ready for the intended use.”
I. Installer:
   1. An “Installer” is the Contractor or an entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.
   2. The term “experienced,” when used with the term “Installer,” means having a minimum of five previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.
J. Trades: Use of titles such as “carpentry” is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as “carpenter.” It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
K. Project Site is the space available to the Contractor for performance of construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of
the Project Site is shown on the Drawings, and may or may not be identical with the description of the land on which the Project is to be built.

1. If areas available are not indicated, they will be as mutually agreed by Owner and Contractor at Preconstruction Conference and as modified during construction.

L. Testing Laboratories: A “testing laboratory” is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

M. OFOI: Owner Furnished, Owner Installed.

1. Equipment indicated on the drawings with the (OFOI) symbol designates the Owner will supply and deliver to the project site any equipment and finish items specified in these specifications and the Owner install the equipment and finish items in place ready for intended use.

2. The Owner shall furnish all standard integral parts of the equipment and finishes, and tailgate-deliver items to project site.

3. Owner shall receive items at site and give written receipt for items at time of delivery, noting visible defects or omissions. If such declaration is not given, the Owner shall assume responsibility for such defects and omissions. Contractor shall be responsible for cooperating with the Owner who shall provide unloading, handling and proper storage of equipment prior to installation at the site. The Owner and the Contractor will coordinate deliveries of equipment and finish items to coincide with construction schedule to minimize storage of equipment before installation.

4. Owner shall uncrate, assemble, set items in place, and install items in accordance with manufacturer's instructions.

5. Contractor shall provide utility rough-in for equipment items where required regardless of equipment responsibility designation unless specifically noted otherwise.

6. Contractor shall be responsible for verification of utility requirements for approved equipment items. Upon request, the Owner shall make available dimensions and power characteristics of the Owner-furnished items.

N. OFCI: Owner Furnished, Contractor Installed.

1.03 SPECIFICATION FORMAT AND CONTENT EXPLANATION:

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute’s 16-Division format and MASTERFORMAT numbering system.

B. Specification Content: This Specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language:
   a. Language used in Specifications and other Contract Documents is the abbreviated type. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated shall be interpolated as the sense required. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the context of the Contract Documents so indicates.

2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
1.04  INDUSTRY STANDARDS:

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

B. Publication Dates: Comply with the standard in effect as of the date of the Contract Documents.

C. Conflicting Requirements:
   1. Where compliance with two or more standards is specified, and the standards may establish different or conflicting requirements for minimum quantities or quality levels. Refer requirements that are different, but apparently equal, and uncertainties to the Architect for a decision before proceeding.
   2. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

D. Copies of Standards:
   1. Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entity’s construction activity. Copies of applicable standards are not bound with the Contract Documents.
   2. Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

1.05  DRAWING SYMBOLS:

A. General: Except as otherwise indicated, graphic symbols used on drawings are those symbols recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by “Architectural Graphic Standards”, published by John Wiley & Sons, Inc., seventh edition.

B. Mechanical/Electrical Drawings: Graphic symbols used on mechanical and electrical drawings are generally aligned with symbols recommended by ASHRAE. Where appropriate, these symbols are supplemented by more specific symbols as recommended by other recognized technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to the Architect/Engineer for clarification before proceeding.

1.06  SUBMITTALS:

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

PART 2 - PRODUCTS - NOT USED
PART 3 - EXECUTION - NOT USED

END OF SECTION 01095
SECTION 01100
SUMMARY OF THE WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS AND GENERAL INFORMATION
A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.02 PROJECT/WORK IDENTIFICATION
A. General: Project name is "LIMESTONE COUNTY TEMPORARY COURTHOUSE, for LIMESTONE COUNTY, Athens, Alabama", as shown on the Contract Documents prepared by Goodwyn, Mills and Cawood, Inc., dated October 11, 2013.
B. Contract Documents indicate the work of the Contract and related requirements and conditions that have an impact on the project.
C. Summary by References: Work of the Contract can be summarized by references to the Contract, General Conditions, Supplementary Conditions (if any), the Project Manual, Technical Specification Sections, Drawings, Addenda and modifications to the Contract Documents issued subsequent to the initial printing of this Project Manual and the Drawings, and including but not necessarily limited to printed material referenced by any of these. It is recognized that the Work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions, and other forces outside the contract documents.
D. Abbreviated Written Summary: Briefly and without force and effect upon the contract documents, the Work of the Contract can be summarized as follows:
   1. The Work includes renovations of existing construction, and related work, as required to complete the facilities as indicated on the Drawings and in the Project Manual.
      a. The temporary courthouse will be a renovation to an existing building. The Contractor shall be responsible for removing portions of existing wall, flooring, ceiling tile, and light fixtures. The new building work will include new gypsum wall assemblies, ceilings, light fixtures, flooring and base. Additional toilet fixtures will be added and main electrical panel will be relocated to a new location. The contract will also require the Contractor to provide a new roof as an alternate. Note: this project will be run by a Construction Manager.
   2. The Occupants of the existing building will temporarily vacate the building during the duration of construction.

1.03 CONTRACTOR USE OF PREMISES
A. General: During the entire construction period the Contractor shall have the exclusive use of the premises for construction operations, including full use of the site as shown on the Drawings.
   1. Limitations of exclusive use of the site:
      a. Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to applicable rules and regulations affecting the work while engaged in project construction. See site plan for egress and ingress to site, or if not indicated, same shall be as designated by the Owner.
      b. Keep existing public roads, driveways and entrances serving the premises clear and available at all times. Do not use these areas for parking or storage of materials. Remove dirt, mud, debris, etc., from site, sidewalks, streets, and public right-of-way as it occurs.
c. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary, obtain and pay for such storage off site in a fully bonded and insured facility acceptable to the Owner, with all items stored clearly identified as being assigned to this project.

d. Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running, or the ignition key in place.

e. The Owner, and their representatives, the Architect and their Consultants, as well as authorities having jurisdiction will require site accessibility for inspections, observations, and perhaps other purposes, related to the planned new construction. The Contractor shall assist in such accessibility, to at least the point of providing and maintaining reasonably accessible dry paths to work in progress.

f. Construction operations shall not effect in any manner, the on-going operations of the Owner, immediately adjacent facilities, adjacent property owners or businesses, or others. Refer to Division 1 Section “Special Conditions” for additional information and requirements regarding coordination with Owner’s activities.

   1) Construction equipment shall not come in contact with or swing over existing facilities to remain, public areas, occupied buildings, right-of-ways, etc., which are to remain.

g. The Contractor and their employees shall limit any discussion of the Work of this project to the Owner’s representatives named in the front of this Project Manual, Consultants employed, inspecting authorities with jurisdiction, and the Architect. In no instance shall this project be discussed with others, except as may otherwise be indicated herein.

h. Parking on-site, if any, shall be limited to the “staging areas” indicated on the Drawings, or if not indicated, as mutually agreed between the Owner, Architect, and Contractor at the Pre-Construction Conference.

i. Smoking or other use of tobacco products shall not be permitted within the Owner’s facilities or on roofs.

j. The use or presence of alcohol and/or other debilitating substances shall not be permitted on the project site.

k. Firearms and/or other weapons shall not be permitted on the project site.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION 01100
SECTION 01270
UNIT PRICES

PART 1 - GENERAL
1.01 SUMMARY
A. This Section specifies administrative and procedural requirements for unit prices.
   1. A unit price is an amount proposed by Bidders and stated on "Attachment A to Proposal Form", as a price per unit of measurement for materials and/or services that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased, in accordance the General Conditions and/or other provisions of the Bid and Contract Documents.
   2. Unit prices shall include all necessary material, labor, fees, layout, supervision (field and home office), general expenses, insurance, bonds, overhead, profit and applicable taxes, for unit item of work in place.
   3. Refer to other Division 1 Sections and individual Specification Sections for construction activities requiring the establishment of unit prices. Methods of approval, verification, measurement and payment for unit prices are specified in those sections.
B. Related work specified elsewhere includes:
   1. Section 01015 - Special Conditions.
   2. Division 3 - Concrete Sections.
   3. Division 8 - Doors and Windows Sections.
   4. Division 9 - Finishes Sections.
   5. Division 16 - Electrical Lighting Section.
C. Schedule:
   1. A "Unit Price Schedule" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials and methods described under each unit price.
   2. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this work measured by an independent surveyor acceptable to the Contractor at the Owner's expense.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION
3.01 ITEMIZED UNIT PRICE SCHEDULE
A. Item No. 1 - Sealed Concrete Floor:
   1. Description: Provide concrete floor with sealer, in accordance with Section 03366 - Sealed Concrete Floor.
   2. Unit of Measure: Square Foot (SF) of concrete floor with sealer, installed.
B. Item No. 2 - Floor Trench:
   1. Description: Provide extra trench for plumbing piping or electrical conduit, where directed by Architect or Engineer. This consists of cutting concrete, trenching, installing piping, backfilling with drainage fill, installing vapor barrier, installing new concrete. See drawings.
   2. Unit of Measure: Linear Foot (LF), of floor trench installed.
C. Item No. 3 - VCT Flooring:
   1. Description: Provide VCT flooring, in accordance with Section 09650 - Resilient Flooring, in location directed by Architect.
   2. Unit of Measure: Square Foot (SF) of VCT Flooring tile, in place.
D. Item No. 4 - Rubber Base:
   1. Description: Provide rubber base as specified in Section 09650 - Resilient Flooring in locations directed by Architect.
   2. Unit of Measure: Linear Foot (LF) of rubber base, in place.

E. Item No. 5 - Carpet:
   1. Description: Provide new carpet, to match other new carpet, in location directed by Architect.
   2. Unit of Measure: Square Foot (SF) of carpet, in place.

F. Item No. 6 - Ceiling Tile and Grid, Lay-In (LAC-1):
   1. Description: Provide suspended lay-in ceiling and grid, LAC-1, in accordance with Section 09511 - Suspended Acoustical Ceilings, in location directed by Architect.
   2. Unit of Measure: Square Foot (SF) of ceiling, in place.

G. Item No. 7 - Wood Doors:
   1. Description: Provide additional wood doors in accordance with Section 08211 - Flush Wood Doors. Include hardware.
   2. Unit of Measure: Each (EA) wood door, in place.

H. Item No. 8 - Hollow Metal Frames:
   1. Description: Provide additional hollow metal door frames as specified in Section 08110 - Steel Doors and Frames, where directed by Architect.
   2. Unit of Measure: Each (EA) hollow metal frame, in place.

I. Item No. 9 - 2 x 4 Light Fixtures:
   1. Description: Provide new light fixture, with all components, installed in location directed by Architect.
   2. Unit of Measure: Each (EA) light fixture, installed.

END OF SECTION 01270
SECTION 01290
PAYMENT PROCEDURES

PART 1 - GENERAL

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

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

1.03 DEFINITIONS
A. Schedule of Values: A statement acceptable to the Owner and Architect 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.

1.04 SCHEDULE OF VALUES
A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
   1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
      a. Application for Payment forms with Continuation Sheets.
      b. Submittals Schedule.
      c. 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.
B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
   1. Identification: Include the following Project identification on the Schedule of Values:
      a. Project name and location.
      b. Contractor's name and address.
      c. Date of submittal.
   2. Submit draft of Schedule of Values that will accompany Application for Payment.
   3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
      a. Related Specification Section or Division.
      b. Description of the Work.
      c. Name of subcontractor.
      d. Name of manufacturer or fabricator.
      e. Name of supplier.
      f. Change Orders (numbers) that affect value.
      g. Dollar value.
         1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
   4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training in the amount of 5 percent of the Contract Sum.

5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.

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

8. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

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

### 1.05 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by approving authority and paid for by Owner.
   1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

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

C. Payment Application Forms: Use Application and Certificate for Payment form stipulated in front-end documents as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Approving authority will return incomplete applications without action.
   1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
   2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments.
   1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
   1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
   2. When an application shows completion of an item, submit final or full waivers.
   3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
   4. Submit final Application for Payment with or preceded by 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 waivers of lien on forms, executed in a manner acceptable to Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
   1. List of subcontractors.
   2. Schedule of Values.
   3. Contractor's Construction Schedule (preliminary if not final).
   4. Products list.
   5. Schedule of unit prices.
   7. List of Contractor's staff assignments.
   8. List of Contractor's principal consultants.
   11. Initial progress report.
   13. Certificates of insurance and insurance policies.
   15. Data needed to acquire Owner's insurance.
   16. Initial settlement survey and damage report if required.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
   1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
   2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
   1. Evidence of completion of Project closeout requirements.
   2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
   3. Updated final statement, accounting for final changes to the Contract Sum.
   5. Evidence that claims have been settled.
6. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 - PRODUCTS - NOT USED
PART 3 - EXECUTION - NOT USED

END OF SECTION 01290
SECTION 01300
ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Requests For Information
B. Preconstruction meeting.
C. Progress meetings.
D. Submittals for review, information, and project closeout.
E. Number of copies of submittals.

1.02 RELATED SECTIONS
A. Section 01015 - Special Conditions: Additional Submittal Requirements.
B. Section 01700 - Execution Requirements: Additional coordination requirements.
C. Section 01780 - Closeout Submittals: Project record documents.

1.03 PROJECT COORDINATION
A. Project Coordinator: Construction Manager.
B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for traffic, and parking facilities.
C. During construction, coordinate use of site and facilities through the Project Coordinator.
D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities.
F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
G. Make the following types of submittals to Architect through the Project Coordinator:
   1. Requests for interpretation.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Manufacturer's instructions and field reports.
   6. Applications for payment and change order requests.
   7. Progress schedules.
   8. Coordination drawings.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 REQUEST FOR INFORMATION
A. Send requests for information (RFI's) to Architect following the example form included at the end of this section.
B. Sequentially number the Requests for Information.

C. RFI's may be submitted up until two business days prior to bidding, and must be received at least 48 hours before time scheduled for bidding.

3.02 PRECONSTRUCTION MEETING

A. Construction Manager will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   3. Construction Manager
   4. Contractor.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract, and Architect.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Scheduling.
   8. Other items: To be announced.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.

D. 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 off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
   10. Coordination of projected progress.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Other business relating to Work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.
3.04 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 Architect, using the submittal numbering tracking system, for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only 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 01780 - CLOSEOUT SUBMITTALS.

3.05 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 Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.06 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   5. Other types as indicated.

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

3.07 NUMBER OF COPIES OF SUBMITTALS (IF NO ELECTRONIC DOCUMENT SUBMITTAL SERVICE USED)

A. Documents for Review:
   1. Small Size Sheets, Not Larger Than 8-1/2 x 11 inches: Submit four copies: the Contractor shall make his own copies from original returned by the Architect; three copies will be retained by the Architect.
   2. Larger Sheets, Not Larger Than 36 x 48 inches: Submit four opaque reproductions; the Contractor shall make his own copies from original returned by the Architect; three copies will be retained by the Architect.

B. Documents for Information: Submit three copies.

C. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.
D. Samples: Submit no less than 3-each of any sample or color chart which is required or otherwise requested, unless more are required in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

E. Refer to Section 01015 - "Special Conditions" for additional information and requirements.

3.08 SUBMITTAL PROCEDURES

A. Transmit each submittal with approved form.

B. Transmit each submittal. Sequentially number each transmittal form according to the example shown on the sample Transmittal form provided at the end of this Section. Include the date, project number and name along with number of copies submitted.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. Deliver submittals to Construction Manager at business address.

F. Schedule submittals to expedite the Project, and coordinate submission of related items.

G. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.

H. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

I. Provide space for Contractor and Architect review stamps.

J. When revised for resubmission, identify all changes made since previous submission.

K. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

L. Submittals not requested will not be recognized or processed.

END OF SECTION 01300
**005 - 09650 - 01A**

- **Consecutive Submittal For Project**
- **Specification Section**
- **First submittal for spec section**
  - 02 = 2nd submittal for spec section
- **A = First time submitted for that section/item.**
  - **B = Indicates resubmittal**
  - **C = 3rd submittal for same item**

***

INCLUDE ARCHITECT'S PROJECT NUMBER ON ALL SUBMITTAL TRANSMITTALS

**Architect's Project No. & Name: ABHM130022R – Limestone COUNTY TEMPORARY COURTHOUSE for Limestone County Commission Athens, Alabama**
REQUEST FOR INFORMATION

RFI No. ______________________

DATE: ______________________ PROJECT NAME: ______________________

GM&C PROJECT No. ________________

FROM: ________________________ PROJECT MANAGER: ______________________

______________________________ GOODWYN, MILLS & CAWOOD, INC.

______________________________ 2701 First Avenue South, Suite 100

______________________________ Birmingham, AL 35233

REQUEST:

SIGNATURE: ______________________

SUGGESTION:

RESPONSE: ROUTING: ________________ DATE REC'D: ________________

SIGNATURE: ______________________ DATE RET'D: __________________

DISTRIBUTION: O Contract Administrator  O Consultant  O ______  O ______  O _______

*** SEND THIS FORM TO THE CONTRACT ADMINISTRATION COORDINATOR ***
**TRANSMITTAL**

No. ____

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Shop Drawing / Submittal No. (see example below) | Description
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RESPONSE: ROUTING: _________________ DATE REC'D: _________________

SIGNATURE: _________________ DATE RET'D: _________________

Shop Drawing / Submittal Number Example 005 - 09650 - 01A

Consecutive submittal for Project

Specification Section

First submittal for spec section

02 = 2nd submittal for spec section

A = First time submitted for that section/item

B = Indicates resubmittal

C = Third submittal for same item

*** SEND THIS FORM TO THE CONTRACT ADMINISTRATION COORDINATOR ***
PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Quality assurance submittals.
B. Mock-ups.
C. Control of installation.
D. Tolerances.
E. Testing and inspection services.
F. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

A. Section 01095 - Reference Standards and Definitions.
B. Section 01300 - Administrative Requirements: Submittal procedures.
C. Section 01600 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS


1.04 SUBMITTALS

A. Testing Agency Qualifications:
   1. Prior to start of Work, 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.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   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/inspection.

h. Date of test/inspection.

i. Results of test/inspection.

j. Conformance with Contract Documents.

k. When requested by Architect, provide interpretation of results.

2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.

1. Indicate material or product conforms to 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 Architect.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.

1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

G. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.

1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.05 TESTING AND INSPECTION AGENCIES

A. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

C. Contractor Employed Agency:


2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.

3. Laboratory: Authorized to operate in the State in which the Project is located.

4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

5. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.
D. Refer to Section 01015 - "Special Conditions" for additional information and requirements.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers’ instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. See individual specification sections for testing required.

B. Testing Agency Duties:
   1. Test samples of mixes submitted by Contractor.
   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 Architect and Contractor of observed irregularities or non-conformance of Work or products.
6. Perform additional tests and inspections required by Architect.
7. Submit reports of all tests/inspections specified.

C. Limits on Testing/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.

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re-testing will be charged to the Contractor by deducting testing charges from the Contract Price.

F. Refer to Section 01015 - "Special Conditions" for additional information and requirements.

3.05 MANUFACTURERS' FIELD SERVICES
   A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
   B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT
   A. Replace Work or portions of the Work not conforming to specified requirements.
   B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION 01400
SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Temporary utilities.
B. Temporary telecommunications services.
C. Temporary sanitary facilities.
D. Temporary Controls: Barriers, enclosures, and fencing.
E. Security requirements.
F. Vehicular access and parking.
G. Waste removal facilities and services.
H. Field offices.

1.02 RELATED REQUIREMENTS
A. Section 01585 - Project Signs.

1.03 TEMPORARY UTILITIES
A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
B. Existing facilities may not be used.

1.04 TELECOMMUNICATIONS SERVICES
A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
B. Telecommunications services shall include:
   1. Telephone Lines: One line, minimum; one handset per line.
   2. Internet Connections: Minimum of one; DSL modem or faster.
   3. Cellular phones are an acceptable substitute for items 1 & 2, provided they fulfill requirements of same.

1.05 TEMPORARY SANITARY FACILITIES
A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
B. Maintain daily in clean and sanitary condition.

1.06 BARRIERS
A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
C. Provide protection for plants designated to remain. Replace damaged plants.
D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
1.07 FENCING
   A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks. Provide gates as required by Contractor and/or authorities having jurisdiction, with all related safety and warning signs.
      1. Fencing shall be at least 11-1/2 gauge galvanized chain-link fencing, securely held in place by posts, braces, rails, etc.
   B. Fence shall be approximately 30-feet from perimeter of buildings, unless Drawings indicate otherwise. Extent of fencing shall be as required to maintain a secure worksite.
   C. All such fencing shall be removed upon completion of the work of this project, removed from the site, and any post holes filled and compacted same as adjacent grade or paving, by the Contractor.
   D. Responsibility and maintenance of such fencing and areas within such fencing shall be held by this Contractor beginning at the date of its erection and until its removal, close to the date of project completion.

1.08 EXTERIOR ENCLOSURES
   A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
   B. Contractor shall use portion of parking lot within chain link fence enclosure as lay-down yard. When fencing is removed, or at end of project, these penetrations shall be patched and surfaces re-painted as required.

1.09 INTERIOR ENCLOSURES
   A. Provide temporary partitions and ceilings as indicated to separate work areas from areas not included in renovations, to prevent penetration of dust and moisture into unaffected areas, and to prevent damage to existing materials and equipment.
   B. Construction: Framing and reinforced polyethylene or plywood or gypsum board sheet materials, as indicated on drawings, with closed joints and sealed edges at intersections with existing surfaces:

1.10 SECURITY
   A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
   B. Coordinate with Owner's security program.

1.11 VEHICULAR ACCESS AND PARKING
   A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
   B. Coordinate access and haul routes with governing authorities and Owner.
   C. Provide and maintain access to fire hydrants, free of obstructions.
   D. Provide means of removing mud from vehicle wheels before entering streets.
   E. Designated existing on-site roads may be used for construction traffic.
   F. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.
1.12 WASTE REMOVAL
   A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
   B. Provide containers with lids. Remove trash from site periodically.
   C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
   D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.13 PROJECT SIGNS - SEE SECTION 01585

1.14 FIELD OFFICES
   A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
   B. Provide space for Project meetings, with table and chairs to accommodate 10 persons.
   C. Locate offices a minimum distance of 30 feet from existing and new structures.

1.15 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS
   A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.
   B. Remove underground installations to a minimum depth of 2 feet.
   C. Clean and repair damage caused by installation or use of temporary work.
   D. Restore existing facilities used during construction to original condition.

PART 2 - PRODUCTS - NOT USED
PART 3 - EXECUTION - NOT USED

END OF SECTION 01500
SECTION 01585
PROJECT SIGNS

PART 1 - GENERAL
1.01 SECTION INCLUDES
A. Project informational signs.

1.02 RELATED REQUIREMENTS
A. Section 01015 - Special Conditions: Supplemental sign information.

1.03 REFERENCE STANDARDS
A. FHWA (SHS) - Standard Highway Signs; Federal Highway Administration, U.S. Department of Transportation; 2004.

1.04 QUALITY ASSURANCE
A. Design sign and structure to withstand 50 miles/hr wind velocity.
B. Sign Painter: Experienced as a professional sign painter for minimum three years.
C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

1.05 SUBMITTALS
A. See Section 01300 - Administrative Requirements for submittal procedures.
B. Shop Drawing: Show content, layout, lettering, color, foundation, structure, sizes and grades of members.

PART 2 - PRODUCTS
2.01 SIGN MATERIALS
A. Structure and Framing: wood, structurally adequate.
B. Rough Hardware: Galvanized.
C. Paint and Primers: Exterior quality, two coats; sign background of color as selected. Vinyl lettering acceptable.

2.02 PROJECT INFORMATIONAL SIGNS
A. Painted informational signs: standard products; size lettering to provide legibility at 100 foot distance.
B. Provide at each field office, storage shed, and directional signs to direct traffic into and within site. Relocate as Work progress requires.
C. Provide municipal traffic agency directional traffic signs to and within site.

PART 3 - EXECUTION
3.01 INSTALLATION
A. Install informational signs within one week of beginning project.
B. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
C. Install sign surface plumb and level, with butt joints. Anchor securely.
D. Paint exposed surfaces of sign, supports, and framing.
3.02 MAINTENANCE
   A. Maintain signs and supports clean, repair deterioration and damage.

3.03 REMOVAL
   A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION 01585
SECTION 01600
PRODUCT REQUIREMENTS

PART 1 - GENERAL
1.01 SECTION INCLUDES
A. General product requirements.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations and procedures.
E. Procedures for Owner-supplied products.
F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS
A. Section 01015 - Special Conditions: Additional information and requirements concerning Substitutions.
B. Section 01400 - Quality Requirements: Product quality monitoring.

1.03 SUBMITTALS
A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.
B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 - PRODUCTS
2.01 NEW PRODUCTS
A. Provide new products unless specifically required or permitted by the Contract Documents.
B. Do not use products having any of the following characteristics:
   1. Made of wood from newly cut old growth timber.
C. Where all other criteria are met, Contractor shall give preference to products that:
   1. Are extracted, harvested, and/or manufactured closer to the location of the project.
   2. Have longer documented life span under normal use.
   3. Result in less construction waste.
   4. Are made of vegetable materials that are rapidly renewable.
2.02 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.

2.03 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 PROCEDURES
   A. Acceptance of suppliers, manufacturers, and/or products shall be limited to those named, unless others are properly submitted during bidding in accordance with substitution procedures, and subsequently accepted.
   B. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
      1. Where more or less days were originally stated in individual Sections of the Project Manual, the time limits for such submittals shall be as originally stated. Where no time limit is stated, the time limit stated in Instructions to Bidders shall apply.
   C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
   D. A request for substitution constitutes a representation that the submitter:
      1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
      2. Will provide the same warranty for the substitution as for the specified product.
      3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
      4. Waives claims for additional costs or time extension that may subsequently become apparent.
      5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
   E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.
      1. Submittals during construction other than those pre-qualified or pre-accepted will not be reviewed, but instead returned for re-submittal, without exception.
   F. Substitution Submittal Procedure. A proper pre-bid submittal for "pre-qualified" or "pre-accepted" consideration and review, shall be one which includes at least the following:
      1. Submit request for substitution for consideration. Limit each request to one proposed substitution.
         a. Use Substitution Request form attached at end of this Section.
2. Submit with cover letter which outlines the purpose of the submittal, Architect's specifications which apply, and each variation from the original specification.

3. Submit product data (all current and relevant manufacturer's published data), certified test results attesting to the proposed product equivalence, and additional information as required so that a review can be quickly made by comparing the submittal item to item to the original specification. Include samples and other data as requested for the original item. Burden of proof is on proposer.

4. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 OWNER-SUPPLIED PRODUCTS

A. Owner's Responsibilities:
   1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
   2. Arrange and pay for 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.

B. Contractor's Responsibilities:
   1. Review Owner reviewed shop drawings, product data, and samples.
   2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
   3. Handle, store, install and finish products.
   4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. 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.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. 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 01600
**SUBSTITUTION REQUEST**

Project: ____________________________  Substitution Request Number: ____________________________

From: ____________________________

To: ____________________________  Date: ____________________________

Attn: ____________________________  A/E Project No.: ____________________________

Re: ____________________________  Contract For: ____________________________

Specification Title: ____________________________  Description: ____________________________

Section: ____________________________  Page and Paragraph: ____________________________

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Proposed Substitution: ____________________________

Trade Name: ____________________________

Manufacturer: ____________________________  Model No.: ____________________________

Mfg. Address ____________________________  City, State, zip: ____________________________  Phone: ____________________________

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

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

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The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

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Submitted by: ____________________________

Signed by: ____________________________

Firm: ____________________________

Address: ____________________________

Telephone: ____________________________  E-mail: ____________________________

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**A/E's REVIEW AND ACTION**

- [ ] Substitution approved - Make submittals in accordance with Specifications, Substitution Procedures.
- [ ] Substitution approved as noted - Make submittals in accordance with Specifications Substitution Procedures.
- [ ] Substitution rejected - Use specified materials.
- [ ] Substitution Request received too late - Use specified materials.

Signed by: ____________________________  Date: ____________________________

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Supporting Data Attached:  [ ] Drawings  [ ] Product Data  [ ] Samples  [ ] Tests  [ ] Reports  [ ]

**INCOMPLETE INFORMATION WILL BE GROUNDS FOR REJECTION**
SECTION 01700  
EXECUTION REQUIREMENTS  

PART 1 - GENERAL  

1.01 SECTION INCLUDES  
A. Examination, preparation, and general installation procedures.  
B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.  
C. Pre-installation meetings.  
D. Cutting and patching.  
E. Surveying for laying out the work.  
F. Cleaning and protection.  
G. Closeout procedures, except payment procedures.  
H. General requirements for maintenance service.  

1.02 RELATED REQUIREMENTS  
A. Section 01300 - Administrative Requirements: Submittals procedures.  
B. Section 01400 - Quality Requirements: Testing and inspection procedures.  
C. Section 01500 - Temporary Facilities and Controls: Temporary exterior enclosures.  
D. Section 01500 - Temporary Facilities and Controls: Temporary interior partitions.  
E. Section 01780 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.  
F. Section 02225 - Demolition: Selective demolition of building elements for alterations purposes.  
G. 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  

1.04 SUBMITTALS  
A. See Section 01300 - Administrative Requirements, for submittal procedures.  
B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.  
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.  
   2. Identify demolition firm and submit qualifications.  
   3. Include a summary of safety procedures.  
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.  
   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. Alternatives to cutting and patching.
   f. Effect on work of Owner or separate Contractor.
   g. Written permission of affected separate Contractor.
   h. 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.
   1. Minimum of 3 years of documented experience.
B. For survey work, employ a Professional Land Surveyor licensed in the State in which the Project is located and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.
C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.06 PROJECT CONDITIONS
A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
B. Protect site from puddling or running water.
C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
D. 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.
E. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
F. Pest Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
G. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
H. 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.
1. Contractor shall schedule ordering of products, taking lead-times into account, and shall be responsible for any cost associated with expediting delivery of specified items in order to keep project on schedule.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown 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.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. 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 01600.

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.

1. Every trade shall examine substrate to determine if it is adequate to receive the work of that section prior to initiating work.

2. Notify Contractor of any deficiencies needing correction.

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 misfabrication.

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 Architect 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 Architect, 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 Architect of any discrepancies discovered.
C. Contractor shall locate and protect survey control and reference points.
D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
G. Utilize Standards of Practice for Professional Land Surveyors.
H. 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, ground floor elevations.
I. Periodically verify layouts by same means.
J. 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 shown.
   2. Report discrepancies to Architect 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 rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.
   3. Relocate items indicated on drawings.
   4. 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.
   5. 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.
   1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
   2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
   3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.

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-conforming 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 skilled and experienced 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 07840, to full thickness of the penetrated element.

J. Patching:
   1. 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.
   2. 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.
   3. Match color, texture, and appearance.
   4. 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. Prohibit traffic from landscaped areas.
   H. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.10 ADJUSTING
   A. Adjust operating products and equipment to ensure smooth and unhindered operation.
   B. Testing, adjusting, and balancing HVAC systems: See appropriate Division 15 Section.

3.11 FINAL CLEANING
   A. Execute final cleaning after Substantial Completion but before making final application for payment.
   B. Use cleaning materials that are nonhazardous.
C. 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.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Replace filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, and drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Substantial Completion.

D. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.

E. Accompany Project Coordinator on preliminary final inspection.

F.Notify Architect when work is considered finally complete.

G. Complete items of work determined by Architect's final inspection.

3.13 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION 01700
SECTION 01780
CLOSEOUT SUBMITTALS

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. General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
   B. Section 01300 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
   C. Individual Product Sections: Specific requirements for operation and maintenance data.
   D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS
   A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment. All record documents, warranties and O&M manuals are to be submitted in paper format (1 copy) along with 3 CD's of PDF's of the documents.
   B. At completion of Project, the Contractor shall submit to Architect a complete set of clearly marked-up Project Documents, as follows:
      1. One (1) Original Set clearly marked as-built, record drawings and specifications.
      2. Three (3) CD's or DVDs: Each with as-built record drawings and as-built record specifications along with O&M Manuals and Warranties.
   C. Operation and Maintenance Data:
      1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect 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 Architect comments. Revise content of all document sets as required prior to final submission.
      4. Submit one paper set and three CD's of revised final documents in final form within 10 days after final inspection, each with as-built record drawings and as-built record specifications along with O&M Manuals and Warranties as referenced above.
   D. 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.
4. Submit CD's with PDF's of as-built record drawings and as-built record specifications along with O&M Manuals and Warranties as referenced above.

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.

G. Scan marked-up Record Drawings and Specifications onto two (2) CD's or DVD's (each with as-built record drawings and as-built record specifications).

3.02 OPERATION AND MAINTENANCE DATA

A. 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.


D. Additional information as specified in individual product specification sections.

E. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

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. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

C. Include color coded wiring diagrams as installed.

D. 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.

E. 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.

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operation and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Provide control diagrams by controls manufacturer as installed.

K. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

N. Include test and balancing reports.

O. Additional Requirements: As specified in individual product specification sections.
3.05 OPERATION AND MAINTENANCE MANUALS

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

B. Prepare data in the form of an instructional manual.

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. Provide tabbed dividers for each separate product and system, with typed description of product and major component parts of equipment.

F. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

G. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

H. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

I. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.

J. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

K. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

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 the 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. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.

F. 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.

G. 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.

H. 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 01780
SECTION 02225
DEMOLITION

PART 1 - GENERAL
1.01 SECTION INCLUDES
A. Building demolition excluding removal of hazardous materials and toxic substances.
B. Selective demolition of building elements for alteration purposes.
C. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 01500 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
C. Section 01600 - Product Requirements: Handling and storage of items removed for salvage and relocation.
D. Section 01700 - Execution Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Site Plan: Showing:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.
C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.
D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE
A. Demolition Firm Qualifications:
   1. Company specializing in the type of work required.
   2. Minimum of 5 years of documented experience.
   3. Engage an experienced firm that has successfully completed at least five verifiable demolition projects similar to that indicated for this Project.
B. Regulatory Requirements: Comply with governing EPA notification regulations before starting demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
1. Where required by local Health Department or other authorities having jurisdiction, provide certificate of pest and rodent eradication and subsequent inspection completed prior to and after building demolition.

C. Predemolition Conference: Demolition will be reviewed at required Preconstruction Conference for the Project.
   1. In addition, conduct predemolition conferences at Project site with Owner's representatives, to provide final notice to and coordination with Owner's representatives and on-site personnel.

D. Notices: Contractor shall provide all notices required by Code, applicable regulations, ordinances and/or local and other authorities having jurisdiction.
   1. All notices shall be in writing, with copies provided to the Owner and Architect.

PART 2 PRODUCTS

2.01 MATERIALS
   A. Not used.

PART 3 EXECUTION

3.01 SCOPE
   A. Extent of demolition is indicated on Demolition Plan.
   B. Remove items indicated.
   C. Salvage, relocate, or recycle as directed and as applicable.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS
   A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
      1. Obtain required permits.
      2. Comply with applicable requirements of NFPA 241.
      3. Use of explosives is not permitted.
      4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
      5. Provide, erect, and maintain temporary barriers and security devices.
      6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
      7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
      8. Do not close or obstruct roadways or sidewalks without permit.
      9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
     10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
   B. Do not begin removal until receipt of Notification To Proceed from Owner.
   C. Do not begin removal until built elements to be salvaged or relocated have been removed.
   D. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
   E. Protect existing structures and other elements that are not to be removed.
      1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
   1. Removal of asbestos shall be subject to state and local regulatory requirements.

H. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Dismantle existing construction and separate materials.
   2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.03 EXISTING UTILITIES
   A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
   B. Protect existing utilities to remain from damage.
   C. Do not disrupt public utilities without permit from authority having jurisdiction.
   D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
   E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
   F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
   G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS
   A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
      1. Verify that construction and utility arrangements are as shown.
      2. Report discrepancies to Architect or Engineer before disturbing existing installation.
      3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
   B. Separate areas in which demolition is being conducted from other areas that are still occupied.
      1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01500 in locations indicated on drawings.
   C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
   D. Remove existing work as indicated and as required to accomplish new work.
      1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
      2. Remove items indicated on drawings.
E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL
   A. Remove debris, junk, and trash and legally dispose of off-site.
   B. Remove from site all materials not to be reused on site; do not burn or bury.
   C. Leave site in clean condition, ready for subsequent work.
   D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02225
SECTION 03310

CONCRETE

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:
   1. Formwork.
   2. Reinforcing.
   3. Cast-in-place concrete including mix design, placement procedures, and finishes.

B. Cast-in-place concrete includes the following:
   1. Foundations and footings.
   2. Slabs-on-grade.
   3. Concrete fill on metal deck.
   4. Equipment pads and bases.

C. Related Documents: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

D. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Section 04810, "Unit Masonry Assemblies": Concrete fill for masonry lintels.
   2. Section 05500, "Metal Fabrications": Metal items to be built into concrete.
   3. Section 07900, "Sealants and Joint Fillers": Sealants and joint fillers in concrete work.
   4. Respective Sections of Division 15 and 16, as applicable, for furnishing of inserts, anchorage and erection items required for mechanical and electrical work.
   5. Divisions 15 and 16, as applicable, for furnishing and setting of conduit, pipes and sleeves for mechanical and electrical equipment.

1.2 SUBMITTALS:

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others if requested by Architect.

C. Shop drawings for reinforcement detailing fabricating, bending, and placing concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, bent bar diagrams, and arrangement of concrete reinforcement. Include special reinforcing required for openings through concrete structures.

D. Samples of materials as requested by Architect, including names, sources, and descriptions, as
follows:

1. Color finishes.
2. Normal weight aggregates.
3. Reglets.
4. Waterstops.
5. Vapor retarder/barrier.

E. Laboratory test reports for concrete materials and mix design test.

F. Minutes of preinstallation conference.

1.3 QUALITY ASSURANCE:

A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. ACI 301, "Specifications for Structural Concrete for Buildings".
2. ACI 302, "Guide for Concrete Floor and Slab Construction".
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 309, "Guide for Consolidation of Concrete".
7. ACI 311, "Recommended Practice for Concrete Inspection".
8. ACI 318, "Building Code Requirements for Reinforced Concrete".
9. ACI 347, "Recommended Practice for Concrete Formwork".
11. American Welding Society, AWS D1.4 "Structural Welding Code - Reinforcing Steel".

B. Concrete Testing Service: Engage a testing agency acceptable to Architect to perform material evaluation tests and to design concrete mixes.

C. Materials and installed work may require testing and retesting at any time during progress of Work. Tests, including retesting of rejected materials for installed Work, shall be done at Contractor's expense.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings" and the following:

1. At least 35 days prior to submitting design mixes, conduct a meeting to review detailed requirements for preparing concrete design mixes and to determine procedures for satisfactory concrete operations. Review requirements for submittals, status of coordinating work, and availability of materials. Establish preliminary work progress schedule and procedures for materials inspection, testing, and certifications. Require representatives of each entity directly concerned with cast-in-place concrete to attend conference, including, but not limited to, the following:

   a. Contractor's superintendent.
   b. Agency responsible for concrete design mixes.
c. Agency responsible for field quality control.
d. Ready-mix concrete producer.
e. Concrete subcontractor.
f. Primary admixture manufacturers.

PART 2 - PRODUCTS

2.1 **FORM MATERIALS:**

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

1. Use overlaid plywood complying with U.S. Product Standard PS-1 "A-C or B-B High Density Overlaid Concrete Form," Class I.

2. Use plywood complying with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood," Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.

B. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Form Release Agent: Provide commercial formulation form release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling of concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to the plane of the exposed concrete surface.

E. Provide ties that, when removed, will leave holes not larger than 1 inch in diameter in the concrete surface.

2.2 **REINFORCING MATERIALS:**

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Steel Wire: ASTM A 82, plain, cold-drawn steel.


E. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar-type supports complying with CRSI specifications.
1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2. For exposed-to-view concrete surfaces where legs of supports are in contact with forms, provide supports with legs that are protected by plastic (CRSI, Class 1) or stainless steel (CRSI, Class 2).

F. Threaded Dowels: Continuous threaded high-strength steel bars equal to "Lasstud" by Richmond Screw Anchor Co., Inc. Provide inserts compatible with dowels, designed for ultimate pull-out force indicated on the drawings.

G. Mechanical Splices: Equal to "Cadweld Rebar Splices", as manufactured by Erico Products, Inc., "C" Series, for developing 125% of minimum ASTM specified yield strengths, unless otherwise noted on drawings.

H. Steel Shapes, Plates and Rods: Conform to ASTM A 36, "Specification for Structural Steel".

I. Do Not Weld Reinforcing Steel: Unless specifically noted on drawings. If welding is shown, conform to latest revision of AWS D12.1, "Reinforcing Steel Welding Code of the American Welding Society". Perform all welding with certified welders qualified per AWS.

2.3 CONCRETE MATERIALS:

A. Portland Cement: ASTM C 150, Type I.
   1. Use one brand of cement throughout Project unless otherwise acceptable to Architect.

B. Fly Ash: ASTM C 618, Type F or C.
   1. Limit use of fly ash to not exceed 20 percent of cement content by weight.

C. Normal-Weight Aggregates: ASTM C 33 and as specified. Provide aggregates from a single source for exposed concrete.
   1. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances that cause spalling.
   2. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Architect.

D. Water: Potable.

E. Admixtures, General: Provide concrete admixtures that contain not more than 0.1 percent chloride ions.

F. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Air-Tite, Cormix Construction Chemicals.
      b. Air-Mix or Perma-Air, Euclid Chemical Co.
G. Water-Reducing Admixture: ASTM C 494, Type A.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. PSI N, Cormix Construction Chemicals.
   b. Eucon WR-75, Euclid Chemical Co.
   c. WRDA, W.R. Grace & Co.
   d. Pozzolith Normal or Polyheed, Master Builders, Inc.
   e. Plastocrete 161, Sika Corp.

H. High-Range Water-Reducing Admixture: ASTM C 494, Type F or Type G.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Eucon 37, Euclid Chemical Co.
   b. WRDA 19 or Daracem, W.R. Grace & Co.
   c. Rheobuild or Polyheed, Master Builders, Inc.
   d. Sikament 300, Sika Corp.

I. Water-Reducing, Accelerating Admixture: ASTM C 494, Type E.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Accelguard 80, Euclid Chemical Co.
   c. Pozzutec 20, Master Builders, Inc.

J. Water-Reducing, Retarding Admixture: ASTM C 494, Type D.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Eucon Retarder 75, Euclid Chemical Co.
   b. Daratard-17, W.R. Grace & Co.
   c. Pozzolith R, Master Builders, Inc.
   d. Protard, Prokrete Industries.
   e. Plastiment, Sika Corporation.

2.4 RELATED MATERIALS:

A. Reglets: Where sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 0.0217-inch-thick (26-gage) galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.

B. Vapor Barrier:

1. Vapor Barrier, General Use (except as indicated below):
   a. Product: Plastic vapor barrier. Include manufacturer’s recommended adhesive or pressure-sensitive tape for sealing joints, laps and penetrations, preformed
boots for penetrations, and all other components required for a complete, proper and vaporproof installation.

1) Classification: Must exceed ASTM E 1745 Class “A”.
2) Permeance: ASTM E96: 0.03 perms or less.
3) Thickness: Not less than 10 mils.

b. Manufacturer/Product:

2) “Perminator 10 mil”, W.R. Meadows
3) “Griffolyn Type-105”, Reef Industries, Inc.
4) “Stego Wrap Class A”, Stego Industries, LLC.
5) “VaporBlock VB10”, Raven Inc.
6) “Viper Vaporcheck 10-mil”, Insulation Solutions, Inc.

b. Locations for Use: Continuous below all new and opened building slabs, and other structural slabs, porches, stoops, pads, covered (below roofs) areas, etc., on grade, and turned-down to tops of footings.

2. Vapor Barrier, Below Wood Flooring: Provide below and 5’-0” beyond all wood flooring; Premolded seven-ply membrane consisting of reinforced core and carrier sheet with fortified bitumen layers, protective weathercoating, and plastic anti-stick sheet. Provide manufacturer's recommended mastics and gusset tape.

a. Product/Manufacturer: Subject to compliance with requirements, provide “Premoulded Membrane Vapor Seal with Plasmatic Core,” as manufactured by W.R. Meadows, Inc.; Austell, GA.

b. Locations for Use: Continuous below and 5’-0” beyond all wood flooring.

C. Nonslip Aggregate Finish: Provide fused aluminum oxide granules or crushed emery as the abrasive aggregate for a nonslip finish, with emery aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent ferric oxide. Use material that is factory-graded, packaged, rustproof, nonglazing, and unaffected by freezing, moisture, and cleaning materials.

D. Colored Wear-Resistant Finish: Packaged dry combination of materials consisting of portland cement, graded quartz aggregate, coloring pigments, and plasticizing admixture. Use coloring pigments that are finely ground nonfading mineral oxides interground with cement. Color as selected by Architect from manufacturers' standards, unless otherwise indicated.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Quartz Tuff, Dayton-Superior.
b. Surflex, Euclid Chemical Co.
c. Colorundum, A.C. Horn, Inc.
d. Quartz Plate, L&M Construction Chemicals, Inc.
e. Colorcron, Master Builders, Inc.
f. Lithochrome Color Hardener, L.M. Scofield Co.
g. Harcol Redi-Mix, Sonneborn-Chemrex.
h. Hard Top, Symons Corp.

E. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
F. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
   1. Waterproof paper.
   2. Polyethylene film.
   3. Polyethylene-coated burlap.

G. Liquid Membrane-Forming Curing Compound: Liquid-type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.55 kg/sq. meter when applied at 200 sq. ft./gal.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Spartan-Cote, The Burke Co.
      b. Day-Chem Cure and Seal, Dayton Superior Corp.
      c. Eucocure, Euclid Chemical Co.
      d. Horn Clear Seal, A.C. Horn, Inc.
      e. L&M Cure R, L&M Construction Chemicals, Inc.
      f. Masterkure, Master Builders, Inc.
      g. CS-309, W.R. Meadows, Inc.
      h. Kure-N-Seal, Sonneborn-Chemrex.

H. Water-Based Acrylic Membrane Curing Compound: ASTM C 309, Type I, Class B.
   1. Provide material that has a maximum volatile organic compound (VOC) rating of 350 g/L.
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. Sealco - VOC, Cormix Construction Chemicals.
      b. Safe Cure and Seal, Dayton Superior Corp.
      c. Aqua-Cure, Euclid Chemical Co.
      d. Dress & Seal WB, L&M Construction Chemicals, Inc.
      e. Masterkure 100W, Master Builders, Inc.

I. V.O.C. Compliant Acrylic Curing and Sealing Type (30 Percent): Liquid type membrane-forming curing compound complying with ASTM C 309, Type 1, Class A and B. Provide 30 percent solids minimum, for surfaces indicated to be sealed.

J. Safe Cure and Seal: 30 percent (J-19), Dayton Superior Inc.

K. Evaporation Control:
   1. Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
      a. Products: Subject to compliance with requirements, provide one of the following:
         1. Eucobar, Euclid Chemical Co.
         2. E-Con, L&M Construction Chemicals, Inc.
         3. Confilm, Master Builders, Inc.

L. V.O.C. Compliant Evaporation Control: Sure Film (J-74), Dayton Superior Inc.
M. Underlayment Compound: Free-flowing, self-leveling, pumpable, cement-based compound for applications from 1 inch thick to feathered edges.

1. Products: Subject to compliance with requirements, provide one of the following:
   b. LevelLayer II, Dayton Superior Corp.
   c. Flo-Top, Euclid Chemical Co.
   d. Gyp-Crete, Gyp-Crete Corp.
   e. Levelex, L&M Construction Chemicals, Inc.
   f. Underlayment 110, Master Builders, Inc.
   g. Thoro Underlayment Self-Leveling, Thoro System Products.

N. Bonding Agent: Polyvinyl acetate or acrylic base.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Polyvinyl Acetate (Interior Only):
      1. Superior Concrete Bonder, Dayton Superior Corp.
      2. Euco Weld, Euclid Chemical Co.
      3. Weld-Crete, Larsen Products Corp.
      4. Everweld, L&M Construction Chemicals, Inc.
      5. Ready Bond, Symons Corp.
   b. Acrylic or Styrene Butadiene:
      1. Acrylic Bondcrete, The Burke Co.
      2. Day-Chem Ad Bond, Dayton Superior Corp.
      3. SBR Latex, Euclid Chemical Co.
      5. Hornweld, A.C. Horn, Inc.
      6. Everbond, L&M Construction Chemicals, Inc.
      7. Acryl-Set, Master Builders Inc.

O. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Resi-Bond (J-58), Dayton Superior.
   b. Euco Epoxy System #452 or #620, Euclid Chemical Co.
   c. Epoxytite Binder 2390, A.C. Horn, Inc.
   d. Epabond, L&M Construction Chemicals, Inc.
   e. Concrexive Standard Liquid, Master Builders, Inc.
   g. Sikadur 32 Hi-Mod, Sika Corp.

P. Interior Epoxy Sealer: Use a maximum 35 percent type.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Epoxy-Plus; Dayton Superior Inc.
   b. Eucopoly 1; Euclid Chemical
c. Oauerseal 30E; Non-Crete, Inc.
d. Rescon R117; Symons Corp.
e. Son-No-Mar; Sonneborn, Div./Chem Rex Inc.
f. Super Seal 35; L & M Const. Chem. Co.

Q. V.O.C. Compliant Urethane Sealer:
   1. Day Chem Urethane V.O.C. (J-39); Dayton Superior Inc.

2.5 PROPORTIONING AND DESIGNING MIXES:

A. Prepare design mixes for each type and strength of concrete by either laboratory trial mixtures or field experience methods as specified in ACI 318-89 Section 5.3. If trial mixtures method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing, unless otherwise acceptable to Architect.

B. Trial mix designs and strength tests, made by qualified independent material laboratory, in accordance with ACI 318-89 Section 5.3 are required for the following types of concrete:
   1. Normal weight concrete with specified strength in excess of 3000 psi.
   2. All concrete designs for which a suitable experience record is not available.

C. Mix design based on a record of past performance in accordance with ACI 318-89 Section 5.3, may be provided by qualified concrete supplier or precast concrete manufacturer for concrete designs. Mix design shall be certified by an independent testing laboratory.

D. All concrete mix designs shall include the following information:
   1. Proportions of cement, fine and coarse aggregate and water.
   2. Water/cement ratio, design strength, slump and air content.
   3. Type of cement and aggregates.
   4. Type and dosage of all admixtures.
   5. Type, color and dosage of integral coloring compounds, where applicable.
   6. Special requirements for pumping.
   7. Any special characteristics of the mix which require precautions in the mixing, placing or finishing techniques to achieve the finished product specified.

E. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by Architect.

F. Concrete for exposed slab on grade and slab on deck shall be a mix with 50% slag and 50% gray cement. Samples shall be submitted to Architect for review with concrete mix design submittal.

G. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:
   1. Subjected to freezing and thawing: W/C 0.45.
2. Subjected to deicers/watertight: W/C 0.40.
3. Subjected to brackish water, salt spray, or deicers: W/C 0.40.

H. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
1. Ramps and sloping surfaces: Not more than 3 inches.
2. Reinforced foundation systems: Not less than 1 inch and not more than 3 inches.
3. Concrete containing high-range water-reducing admixture (superplasticizer): Not more than 8 inches after adding admixture to site-verified 2-to-3-inch slump concrete.
4. Other concrete: Not less than 3 inches and not more than 5 inches.

2.6 ADMIXTURES:

A. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.

B. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg.F (10 deg.C).

C. Use high-range water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water-cement ratios below 0.50.

D. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within the following limits:

1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure:
   a. 4.5 percent (moderate exposure); 5.5 percent (severe exposure) for 1-1/2-inch maximum aggregate.
   b. 4.5 percent (moderate exposure); 6.0 percent (severe exposure) for 1-inch maximum aggregate.
   c. 5.0 percent (moderate exposure); 6.0 percent (severe exposure) for 3/4-inch maximum aggregate.
   d. 5.5 percent (moderate exposure); 7.0 percent (severe exposure) for 1/2-inch maximum aggregate.

2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent air.

E. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.

1. When air temperature is between 85 deg.F (30 deg.C) and 90 deg.F (32 deg.C), reduce
mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg.F (32 deg.C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 GENERAL:

A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing steel.

3.2 FORMS:

A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:

1. Provide Class A tolerances for concrete surfaces exposed to view.
2. Provide Class C tolerances for other concrete surfaces.

B. Construct forms to sizes, shapes, lines, and dimensions shown and to obtain accurate alignment, location, grades, level, and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like for easy removal.

D. Provide temporary openings for clean-outs and inspections where interior area of formwork is inaccessible before and during concrete placement. Securely brace temporary openings and set tightly to forms to prevent losing concrete mortar. Locate temporary openings in forms at inconspicuous locations.

E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.3 VAPOR RETARDER/BARRIER INSTALLATION:

A. General: Place vapor retarder/barrier sheeting in position with longest dimension parallel with direction of pour.

B. Lap joints 6 inches and seal with manufacturer's recommended mastic or pressure-sensitive tape.

3.4 PLACING REINFORCEMENT:

A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as specified.

1. Avoiding cutting or puncturing vapor retarder/barrier during reinforcement placement and concreting operations. Repair damages before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect.

D. Place reinforcement to maintain minimum coverages as indicated for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS:

A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Architect.

B. Provide keyways at least 1-1/2 inches deep in construction joints in walls and slabs and between walls and footings. Bulkheads designed and accepted for this purpose may be used for slabs.

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across
construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.

D. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

E. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Joint fillers and sealants are specified in Section 07900, "Sealants and Joint Fillers".

F. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch wide by one-fourth of slab depth or inserts 1/4 inch wide by one-fourth of slab depth, unless otherwise indicated.

1. Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.

2. Contraction joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.

3. If joint pattern is not shown, provide joints not exceeding 15 feet in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).

4. Joint fillers and sealants are specified in Division 7 Section "Joint Sealants."

3.6 INSTALLING EMBEDDED ITEMS:

A. General: Set and build into formwork anchorage devices and other embedded items required for other work that is attached to or supported by cast-in-place concrete. Use setting drawings, diagrams, instructions, and directions provided by suppliers of items to be attached.

B. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, relieving angles, and other conditions.

C. Install dovetail anchor slots in concrete structures as indicated on drawings.

D. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.7 PREPARING FORM SURFACES:

A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.

B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to manufacturer's instructions.
1. Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

### 3.8 CONCRETE PLACEMENT:

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.


C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.

D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.

2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.

E. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.

1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.

2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

3. Maintain reinforcing in proper position on chairs during concrete placement.

F. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

G. When air temperature has fallen to or is expected to fall below 40 deg.F (4 deg.C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg.F (10 deg.C) and not more than 80 deg.F (27 deg.C) at point of placement.
1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

H. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg.F (32 deg.C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.

3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.

4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Architect.

3.9 FINISHING FORMED SURFACES:

A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

B. Smooth-Formed Finish: Provide a smooth-formed finish on formed concrete surfaces exposed to view or to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.

C. Smooth-Rubbed Finish: Provide smooth-rubbed finish on scheduled concrete surfaces that have received smooth-formed finish treatment not later than 1 day after form removal.

1. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.
3.10 MONOLITHIC SLAB FINISHES:

A. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and where indicated.

1. After placing slabs, finish surface to tolerances specified in Section 3.11. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.

B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and where indicated.

1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, when surface water has disappeared, or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances specified in Section 3.11. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or another thin film-finish coating system.

1. After floating, begin first trowel-finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and finish surfaces to tolerances specified in Section 3.11. Grind smooth any surface defects that would telegraph through applied floor covering system.

D. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply a trowel finish as specified, then immediately follow by slightly scarifying the surface with a fine broom.

E. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

F. Colored Wear-Resistant Finish: Apply a colored wear-resistant finish to monolithic slab surface indicated.

1. Apply dry shake materials for the colored wear-resistant finish at a rate of 100 lb per 100 sq. ft., unless a greater amount is recommended by material manufacturer.
2. Cast a trial slab approximately 10 feet square to determine actual application rate, color, and finish, as acceptable to Architect.

3. Immediately following the first floating operation, uniformly distribute with mechanical spreader approximately two-thirds of the required weight of the dry shake material over the concrete surface, and embed by power floating. Follow floating operation with second shake application, uniformly distributing remainder of dry shake material with overlapping applications to ensure uniform color, and embed by power floating.

4. After broadcasting and floating, apply a trowel finish as specified. Cure slab surface with a curing compound recommended by the dry shake material manufacturer. Apply the curing compound immediately after the final finishing.

3.11 FLOOR FLATNESS/LEVELNESS REQUIREMENTS:

A. After placing slabs, finish surface to the following tolerances of F(F) (floor flatness) and F(L) (floor levelness) measured according to ASTM E 1155:

<table>
<thead>
<tr>
<th>FINISH</th>
<th>SLAB-ON-GRADE</th>
<th>FRAMED FLOOR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OVERALL LOCAL</td>
<td>OVERALL LOCAL</td>
</tr>
<tr>
<td></td>
<td>FF  FL  FF  FL</td>
<td>FF  FF</td>
</tr>
<tr>
<td>Scratch Finish</td>
<td>18  15  15   13</td>
<td>25  22</td>
</tr>
<tr>
<td>Float Finish</td>
<td>20  17  18   15</td>
<td>25  22</td>
</tr>
<tr>
<td>Trowel Finish</td>
<td>25  22  20   17</td>
<td>25  22</td>
</tr>
</tbody>
</table>

Specified overall F-numbers apply to the whole floor, taken as one. Minimum local F-numbers apply to each slab, bounded by construction joints.

3.12 MISCELLANEOUS CONCRETE ITEMS:

A. Filling In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

3.13 CONCRETE CURING AND PROTECTION:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and
B. No curing agents or sealers are to be applied to the concrete slab where Resilient Athletic Flooring is scheduled.

C. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

D. Curing Methods: Cure concrete by curing compound, by moist curing, by moisture-retaining cover curing, or by combining these methods, as specified.

1. Provide moisture curing by the following methods:
   a. Keep concrete surface continuously wet by covering with water.
   b. Use continuous water-fog spray.
   c. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 4-inch lap over adjacent absorptive covers.

2. Provide moisture-retaining cover curing as follows:
   a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Apply curing compound on exposed interior slabs and on exterior slabs, walks, and curbs as follows:
   a. Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller according to manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
   b. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.

E. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

F. Curing Unformed Surfaces: Cure unformed surfaces, including slabs, floor topping, and other flat surfaces, by applying the appropriate curing method.

1. Final cure concrete surfaces to receive finish flooring with a moisture-retaining cover, unless otherwise directed.

3.14 REMOVING FORMS:

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

B. Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days or until concrete has attained at least 75 percent of design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

C. Form-facing material may be removed 4 days after placement only if shores and other vertical supports have been arranged to permit removal of form-facing material without loosening or disturbing shores and supports.

3.15 REUSING FORMS:

A. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-coating compound as specified for new formwork.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use patched forms for exposed concrete surfaces except as acceptable to Architect.

3.16 CONCRETE SURFACE REPAIRS:

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to Architect.

B. Mix dry-pack mortar, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing.

   1. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.

   2. For surfaces exposed to view, blend white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

C. Repairing Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out
form tie holes and fill with dry-pack mortar or precast cement cone plugs secured in place with bonding agent.

1. Repair concealed formed surfaces, where possible, containing defects that affect the concrete's durability. If defects cannot be repaired, remove and replace the concrete.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.

1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch wide or that penetrate to the reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.
2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.
3. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect.
4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

E. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.

F. Repair methods not specified above may be used, subject to acceptance of Architect.

3.17 QUALITY CONTROL TESTING DURING CONSTRUCTION:

A. General: The Owner will employ a testing agency to perform tests and to submit test reports.

B. Sampling and testing for quality control during concrete placement may include the following, as directed by Architect.

1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
   a. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
   b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg.F (4 deg.C) and below, when 80 deg.F (27 deg.C) and above, and one test for each set of compressive-strength specimens.

Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.

Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 25 cu. yd. of each concrete class placed in any one day, or for each 5000 sq ft of surface are placed; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

1. Any additional cylinder required by the Contractor for early strength gain tests for form stripping or post-tensioning are Contractor’s responsibility and shall be paid for by Contractor.

2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.

3. When total quantity of a given class of concrete is less than 50 cu. yd., Architect may waive strength testing if adequate evidence of satisfactory strength is provided.

4. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

5. 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.

6. Test results will be reported in writing to Architect, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.

7. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.

8. Additional Tests: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

END OF CONCRETE
SECTION 03366
SEALED CONCRETE FLOOR

PART 1 - GENERAL
1.01 SUMMARY
A. Section Includes:
   1. Floors denoted on Finish Schedule as SC (Sealed Concrete).
B. Related Sections
   1. Drawings and general provisions of Contract, including General Conditions and Division 1 Specification Sections, apply to the work of this Section.
   2. Section 03310 - Concrete.

1.02 SUBMITTALS
A. Contractor shall submit specified manufacturer's complete technical data sheets for all products to be used, including installation instructions.

1.03 QUALITY ASSURANCE
A. Manufacturer Qualifications: Manufacturer of specified sealer shall have a minimum 10 years experience in the production of the specified products.
B. Contractor Qualifications: Contractor must have a minimum 3 years experience in sealing applications and successfully completed not less than 6 projects comparable in scale and complexity.
C. Regulatory Requirements
   1. Products shall comply with the United States Clean Air Act for maximum Volatile Organic Compound (VOC) content as specified in PART 2 of this section.

1.04 DELIVERY, STORAGE AND HANDLING
A. Deliver the specified products in original, unopened containers with legible manufacturer's identification and information.
B. Store specified products in conditions recommended by the manufacturer.

1.05 JOB SITE CONDITIONS
A. Environmental Conditions: Maintain an ambient temperature of between 50°F and 90°F during application and at least 48 hours after application.
B. Protection: Precautions shall be taken to avoid damage or contamination of any surfaces near the work zone. Protect completed stain work from moisture or contamination.

PART 2 - PRODUCTS
2.01 MANUFACTURERS
D. Substitutions: See Section 01600 - Product Requirements.

2.02 PRODUCTS

PART 3 - EXECUTION

3.01 EXAMINATION
A. Verification of Conditions: Contractor shall examine areas and conditions under which work will be performed and identify conditions detrimental to proper and timely completion of work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION
A. New Concrete
   1. Apply sealer/densifier immediately after final finishing when the concrete surface won't be marred by foot traffic or after joints have been cut and cleaned or anytime thereafter.
   2. If the sealer-densifier is not applied at the time of concrete placement, immediately prior to sealing, the concrete must be thoroughly cleaned. The surface should be swept, and then pressure washed or scrubbed using a rotary floor machine. Use of suitable, high quality commercial detergents will facilitate cleaning. The surface must be rinsed after cleaning until the rinse water is completely clean. Allow floor to dry completely prior to application of floor sealer. All floor latents to be removed prior to sealing.

3.03 APPLICATION OF CLEAR SEALER
A. The surface shall be sealed with a clear sealer produced of the type specified under Products above.
B. Apply at the rates and method recommended by manufacturer in written instructions which the installer shall have at the job site.
C. Maintain a wet edge at all times.
D. Allow sealer to completely dry before applying additional coats.
E. Apply second coat of sealer at 90° to the direction of the first coat using the same application method and rates.

3.04 PROTECTION
A. Diaper all hydraulic powered equipment to avoid staining of the concrete.
B. Do not allow any trade to park any vehicles on the inside slab. If necessary to complete their scope of work, drop cloths will be placed under vehicles at all times.
C. Protect slab during masonry work with 1/2-inch plyboard around work area.
D. Place no steel on interior slab to avoid rust stains and gouges. If construction dictates necessity of this, interior slab will be protected with 1/2-inch plyboard.
E. Do not allow acids and acidic detergents to come into contact with slab.
F. Inform all trades that the slab must be protected at all times.
G. Protect finished work until fully cured in accordance with manufacturer's recommendations.
H. Protect completed floor from damage until Substantial Completion.
   1. Do not allow vehicle and pedestrian traffic on unprotected floor.
   2. Do not allow construction materials, equipment, and tools on unprotected floor.
I. Immediately remove mortar splatter, spilled liquids, oil, grease, paint, coatings, and other surface contaminants which could adversely affect completed floor.
J. Repair damaged areas of completed floor to satisfaction of Architect.
K. Protect floor from traffic for at least 72 hours after final application of sealer.

3.05 MAINTENANCE

A. Sealed floors should be maintained by sweeping. Spills should be cleaned when they occur and dirt shall be rinsed off with water. Heavily soiled areas may be wet-cleaned by mopping or by scrubbing with a rotary floor machine equipped with a scrubbing brush and a suitable, high quality commercial detergent. Interior floors that require polishing should be maintained using a compatible, premium-grade, emulsion-type, commercial floor polish, following manufacturer's instructions and safety requirements.

END OF SECTION 03366
SECTION 04810
UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Concrete Block.
B. Mortar and Grout.
C. Reinforcement and Anchorage.
D. Flashings.
E. Lintels.
F. Accessories.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 01400 - Quality Requirements.
C. Section 05500 - Metal Fabrications: Loose steel lintels.
D. Section 07140 - Fluid-Applied Waterproofing: Spray-Applied Air Barrier on masonry surfaces.
E. Section 07212 - Thermal Insulation: Insulation for cavity between wythes.
F. Section 07900 - Joint Sealers: Backing rod and sealant at control and expansion joints.

1.03 REFERENCE STANDARDS

A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.
E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
J. ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2012.
S. ASTM D2822 - Asphalt Roof Cement.

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, masonry accessories, and other manufactured products indicated, including certifications that each item and type complies with specified requirements. Also, submit product data for flashings and accessories.
C. Samples: Flashings: Submit two 4 x 4 inch samples of masonry flashings.
D. Shop drawings for reinforcing, if any, detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315(Details and Detailing of Concrete Reinforcing), showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.
E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE
A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.
B. Fire Rated Assemblies: Conform to applicable code for fire performance requirements for fire rated masonry construction. Where indicated, provide materials and construction identical to those of assemblies whose fire resistance has been determined per ASTM E 119 by a testing and inspecting organization, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.
C. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.
D. Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
E. Single-Source Responsibility for Through-Wall Flashings: Self-adhering membrane flashings associated with through-wall flashings in this Section shall be manufactured by the manufacturer of the water/air barrier coating specified in Section 07140 - Fluid Applied Waterproofing, for material compatibility and single-source manufacturing responsibility.
F. Subcontractors: Subcontractors shall have been established in their own firms for at least 5 verifiable years and shall have successfully completed at least 5 verifiable projects of this size, scope, and complexity. Furnish names and telephone numbers of General Contractors for each project submitted for consideration of experience requirements.

1.06 PRE-INSTALLATION MEETING
A. Convene one week before starting work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
B. Store cementitious materials and insulation off the ground, under cover, and in dry location.
C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
D. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

1.08 ENVIRONMENTAL REQUIREMENTS
A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530.1/ASCE 6/TMS 602 or applicable building code, whichever is more stringent.

PART 2 - PRODUCTS
2.01 CONCRETE MASONRY UNITS
A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations. Furnish 8 inch deep units if depth is not indicated on the drawings.
   2. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, control joint edges, bonding, and other detailed conditions.
      a. Outside Corner Units: Provide square edged units for outside corners unless otherwise indicated.
      b. Provide one quarter notched foundation block and other preformed shapes, if any, as indicated on the drawings.
   3. Load-Bearing Units: ASTM C 90, normal weight.
      a. Hollow block, as indicated.
      b. Unit Compressive Strength: Provide units with minimum average net area compressive strength of 1,900 psi.
      c. Weight Classification at Above Grade Locations: Lightweight, except provide Normal Weight units where required to achieve required fire-ratings according to manufacturer's testing and/or by "calculated fire resistance" as may be allowed by applicable building code.
      d. Exposed faces: Manufacturer's standard color and texture where indicated.
      a. Hollow block, as indicated.
      b. Unit Compressive Strength: Provide units with minimum average net area compressive strength of 1,900 psi.
      c. Weight Classification: Lightweight.
2.02 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91.

B. Portland Cement: ASTM C 150, Type I; color as required to produce approved color sample, or white in the absence of an approved color selection.
   1. Not more than 0.60 percent alkali.
   2. Hydrated Lime: ASTM C207, Type S.

C. Water: Clean and potable.

D. Accelerating Admixture: Nonchloride type for use in cold weather.

2.03 REINFORCEMENT AND ANCHORAGE

A. Manufacturers of Joint Reinforcement and Anchors:
   5. Substitutions: See Section 01600 - Product Requirements.

B. Reinforcing Steel: ASTM A615/A615M Grade 60 (420) deformed billet bars; uncoated.

C. Single Wythe Joint Reinforcement: Ladder type; ASTM A 82/A 82M steel wire, hot dip galvanized after fabrication to ASTM A 153/A 153M, Class B; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.

D. Anchor Bolts: Steel bolts complying with A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations, as indicated on the Drawings, or if not indicated, as required for the intended use:
   1. Headed bolts.
   2. Nonheaded bolts, straight.
   3. Nonheaded bolts, bent in manner indicated.

E. Post-Installed Anchors, Where indicated or required:
   1. Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing laboratory.
      a. Type: Expansion anchors.
      b. Material: Zinc-plated carbon steel, hot-dipped galvanized after fabrication, or Zamac, or other non-corrosive or coated material in compliance with requirements and submitted for prior approval.
      c. For post-installed anchors in grouted concrete masonry units: Capability to sustain, without failure, a load equal to 6-times loads imposed by masonry.

2.04 FLASHINGS

A. Stainless Steel Flashing: Type 304, soft temper; 24 gauge, 0.0250 inches thick for through-wall applications; 26 gauge otherwise; finish 2B to 2D. Comply with ASTM A 666.
1. Shop-fabricated Metal Flashing (typical below parapet caps and all other tops of walls exposed at the exterior of building and other locations on site), covered with self-adhering flashing to make watertight.

2. Low-profile concealed through-wall sheet metal flashing, fabricated with ribs at 3-inch intervals along length of material, to provide an integral bond with solid mortar bedding at each side.

3. Height: 3/8-inch.

4. Width: 1-inch less than wall thickness (set in-place 1/2-inch back from each exterior wall face).

5. Product: Shop-fabricated stainless steel, fabricated to specific project requirements. Cover with self-adhered, rubberized asphalt flashing for cavity wall application.

6. Location: Masonry cavity flashing at relief angles and as noted.
   a. Waterproofing membrane shall terminate onto stainless steel pan. Termination shall be a minimum of 1" back from face of exterior masonry wall.
   b. Stainless steel flashing shall be end-dammed at termination between through-wall flashing and dissimilar systems.
   c. Provide minimum 2" tall back dams, and minimum 2" tall end dams.

2.05 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:
      d. Substitutions: See Section 01600 - Product Requirements.

B. Joint Filler: Closed cell rubber; oversized 50 percent to joint width; self expanding; by maximum lengths available.
   1. Manufacturers:
      e. Substitutions: See Section 01600 - Product Requirements.

C. Building Paper: ASTM D226, Type I ("No.15") asphalt felt.

D. Termination Bar: Stainless steel bar designed to terminate and seal top of flashing in cavity wall. Bar shall be of lipped design for sealing of top edge, with a compatible sealant as specified in Section 07900 - Joint Sealers. Bar shall have pre-drilled holes 8" o.c. for attachment to substrate with appropriate non-corrosive fasteners. Bar shall be 3/4" wide by 1/8" thick.
   1. Termination bar shall be encapsulated with sealant which is compatible with water/air barrier coating. (Acrylic latex sealant shall NOT be used.)

E. Weeps: Polyester mesh with cotton rope. Color: as selected.
   1. Manufacturers:
      c. Substitutions: See Section 01600 - Product Requirements.

   1. Manufacturers:


G. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.06 MORTAR AND GROUT MIXES

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
   1. Masonry below grade and in contact with earth: Type M.
   2. Exterior, loadbearing masonry: Type S.
   3. Exterior, non-loadbearing masonry: Type S.
   4. Interior, loadbearing masonry: Type S.
   5. Interior, non-loadbearing masonry: Type N.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Grout: ASTM C476. Consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.
   1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry, if any.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

D. Do not proceed until all unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

C. Mason is to coordinate with electrical, mechanical, plumbing, and any other trade that will have in-wall work, prior to starting of masonry work.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

3.04 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.
   1. Mix units from several pallets or cubes as they are placed.

3.05 COURSING
   A. Establish lines, levels, and coursing indicated. Protect from displacement.
   B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
   C. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement type joints, returns, and offsets. Avoid the use of less than half size units at corners, jambs, and where possible at other locations.
   D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2-inches. Bond and interlock each course of each wythe at corners.
   E. Stopping and Resuming Work: In each course, rack back 1/2 unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.
   F. Built-In Work:
      1. As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
      2. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
      3. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
   G. Fill cores in hollow concrete masonry units with grout 3 courses (24-inches) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
   H. Concrete Masonry Units:
      1. Bond: Running, unless indicated otherwise.
      2. Coursing: One unit and one mortar joint to equal 8 inches.
      3. Mortar Joints: Concave, unless indicated otherwise.

3.06 PLACING AND BONDING
   A. Lay hollow masonry units with face shell bedding on head and bed joints.
   B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
   C. Remove excess mortar and mortar smears as work progresses; both outside and inside the cavity.
   D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
   E. Interlock intersections and external corners. Do not use units with less than nominal 4 inch horizontal face dimensions at corners or jambs.
   F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges. Use wet cutting methods to control dust.

H. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

I. Isolate masonry partitions from vertical structural framing members with a control joint.

J. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.07 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

B. Install cavity vents in veneer and cavity walls at 24 inches on center horizontally near top of walls.

3.08 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide concrete unit masonry that develops the following installed compressive strengths (f'\( m \)): f'\( m \) = 1,500 psi.

3.09 REINFORCEMENT AND ANCHORAGE - GENERAL

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

E. Reinforce joint corners and intersections with strap anchors 16 inches on center.

F. Embed tie section in masonry joints. Provide not less than 1 inch air space between back of masonry veneer wythe and face of sheathing.

3.10 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

A. Install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches.

E. Reinforce joint corners and intersections with strap anchors 16 inches on center.

3.11 MASONRY FLASHINGS

A. Install flashings in accordance with Drawings, approved shop drawings, and manufacturer's recommended installation instructions.

B. Whether or not specifically indicated, install embedded concealed flashing and weep holes in masonry at shelf angles, lintels, ledges, and other obstructions to divert water to exterior at all locations where downward flow of water will be interrupted.

1. Extend flashings full width at such interruptions and at least 8 inches into adjacent masonry or turn up at least 8 inches to form watertight pan at non-masonry construction.

2. Remove or cover protrusions or sharp edges that could puncture flashings.
3. Seal lapped ends and penetrations of flashing with approved mastic or approved equivalent before covering with mortar.

C. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing. Place flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive/sealant/tape, as recommended by flashing manufacturer before covering with mortar.
   1. Where indicated or required by manufacturer, provide continuous seal at top edge, using their recommended materials.

D. Cover all flashing splices with a third piece of flashing, fully bedded in medium modulus silicone such as Dow 795, Tremco Spectrem 2, Pecora 895, or approved equal.

E. Extend metal flashings through exterior face of masonry and turn down to form drip. Install joint sealer below drip edge to prevent moisture migration under flashing.

F. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 8 inches on back-up wall (at stud walls), and seal top edge with termination bar and sealant; except turned up a minimum of 8 inches at back-up masonry walls and extended through back-up wall to within 1/2-inch of its interior face.

G. At heads and sills, extend flashing as specified above unless otherwise indicated, but turn up ends not less than 2 inches to form a pan.

H. Lap end joints of flashings at least 6 inches and seal watertight with mastic or elastic sealant.

I. Install stainless steel metal drip edge when using flexible flashing.

J. Prior to starting the installation of flashing, an inplace mock-up will be required.

K. Coordinate step flashing with roof installer.

3.12 LINTELS
   A. Install galvanized loose steel lintels over openings.

   B. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled in accordance with the Structural drawings.

   C. Maintain minimum 8 inch bearing on each side of opening.

3.13 GROUTED COMPONENTS
   A. Lap splices minimum 24 bar diameters or as required by Structural drawings.

   B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

   C. Place and consolidate grout fill without displacing reinforcing.

   D. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.14 CONTROL AND EXPANSION JOINTS
   A. Do not continue horizontal joint reinforcement through control and expansion joints. Install control and expansion joints in unit masonry where existing in floor slabs, walls, and roof, and as otherwise indicated. Build in related items as the masonry progresses.

   B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant. Use firestop materials at fire-rated walls, as specified.
C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

D. Provide control joints at locations indicated or as approved by Architect, and not to exceed the following at continuous straight runs:
1. Exterior walls: 30'-0" o.c. maximum along continuous runs of masonry.
2. Interior walls: 40'-0" o.c. maximum.
3. Also provide control joints at inside corners, and within 2'-0" of outside corners.

E. Size control joint in accordance with Section 07900 for sealant performance.
1. Joint width: 3/8" up to 16' spacing; 1/2" for 16'-22' spacing, and 5/8" for 22'-30' spacing.
2. Joints shall be clear of mortar. Seal with silicone sealant, with optional compressible joint filler.

3.15 BUILT-IN WORK
A. As work progresses, install built-in metal door frames, glazed frames, fabricated metal frames, window frames, anchor bolts, and plates and other items to be built into the work and furnished under other sections.
B. Install built-in items plumb, level, and true to line.
C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
   1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
D. Do not build into masonry construction organic materials that are subject to deterioration.

3.16 TOLERANCES
A. Maximum Variation from Alignment of Columns: 1/4 inch.
B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.
H. Maximum Variation for Vertical Alignment of Head Joints: 1/4 inch in 10 ft, 1/2" maximum.

3.17 CUTTING AND FITTING
A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01400.
B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140 for conformance to requirements of this specification.
C. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.
D. Use Volume Boxes.
3.19 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.
   1. Clean glass unit masonry as work progresses. Remove mortar fins and smears immediately, using a clean, wet sponge or a scrub brush with still fiber bristles. Do not use harsh cleaners, acids, abrasives, steel wool, or wire brushes when removing mortar or cleaning glass unit masonry.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.

C. Remove excess mortar and mortar droppings. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.

D. Replace defective mortar. Match adjacent work.

E. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
   1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
   2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
   3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
   4. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
   5. Clean brick by means of bucket and brush hand-cleaning method described in BIA "Technical Note No. 20 Revised", to clean brick masonry made of clay or shale, except use detergent as the masonry cleaner.
   6. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.
   7. Comply with masonry manufacturer's instructions.

3.20 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

B. Protection of Masonry:
   1. During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
   2. Extend cover a minimum of 24-inches down both sides and hold cover securely in place.
   3. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24-inches down face next to unconstructed wythe and hold cover in place.

C. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

D. Stain Prevention:
1. Prevent grout, mortar, and soil from staining the face of masonry to be left exposed, painted, and/or to receive any other coatings. Remove immediately any grout, mortar, and soil that come in contact with such masonry.

2. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface, until landscaping or other improvements indicated adjacent to completed masonry work are in place.

3. Protect sills, ledges, and projections from mortar droppings.

4. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings, coatings, water repellents, and/or any other damage.

END OF SECTION 04810
SECTION 05400
COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Formed steel stud exterior wall and interior wall framing.

1.02 RELATED REQUIREMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
   B. Section 04810 - Unit Masonry Assemblies: Veneer masonry supported by wall stud metal framing.
   C. Section 05310 - Steel Deck.
   D. Section 06100 - Rough Carpentry: Wood blocking and miscellaneous framing.
   E. Section 07212 - Board and Batt Insulation: Insulation within framing members.
   F. Section 07900 - Joint Sealers.
   G. Section 09260 - Gypsum Board Assemblies: Lightweight, non-load bearing metal stud framing.
   H. Section 09260 - Gypsum Board Assemblies: Gypsum-based sheathing.
   I. Section 09511 - Suspended Acoustical Ceilings: Ceiling suspension system.

1.03 REFERENCE STANDARDS
   A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
   D. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2011c.
   F. AWS D1.3 - Structural Welding Code - Sheet Steel; American Welding Society; 2008.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.05 SYSTEM DESCRIPTION
   A. Horizontal Deflection: Design to permit maximum deflection of 1/600 of span at locations with brick or stucco veneer, and 1/360 at all other locations.
   B. Vertical Deflection: Design non-axial loadbearing framing to accommodate not less than 1/2 in vertical deflection.
C. Design wall system to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.

D. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

E. Work described in this Section includes galvanized steel stud framing systems for use at any new exterior metal stud walls and framing, interior load-bearing walls, and other locations as indicated on drawings.

1. Studs and runner tracks at exterior walls and interior load-bearing walls (if any) shall be 6-inches depth x 1-5/8-inches width x gauge indicated on the Drawings, and spaced at sixteen inches (16") o.c., unless otherwise indicated, with continuous bridging channels and/or stud tracks as bridging channels, as indicated, and framed structural headers at all openings.

2. Joists and rafters (if any) and their stringers (at ends over bearing locations), bridging, and web stiffeners shall be as indicated herein, unless indicated otherwise on the Drawings; joists shall be spaced sixteen (16) inches o.c., directly over bearing studs or immediately adjacent to studs where anchored to sides of stud walls, unless otherwise indicated or accepted in writing by Architect.

3. Typical stud and joist sections shall be C-shape, and at least 1-5/8-inches width.

4. Galvanized steel strap bracing shall be provided, continuous at top and bottom runner tracks and at bridging locations at all curved stud walls.

5. Structural channels, studs, and joists, and other framing shall be as indicated on the Structural Drawings.

1.06 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.

C. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.

D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.

1. Indicate stud and ceiling joist layout.

2. Describe method for securing studs to tracks and for bolted or welded framing connections.

3. Provide design engineer's stamp on shop drawings.

4. Provide calculations for loadings and stresses of specially fabricated framing, stamped by a Professional Structural Engineer.

5. Provide details and calculations for factory-made framing connectors, stamped by a Professional Structural Engineer.

E. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention.

F. Shop drawings shall bear the current State seal and license number of the manufacturer's and/or fabricator's Design Engineer.

1.07 QUALITY ASSURANCE

A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
B. Calculate structural properties of framing members in accordance with requirements of AISI North American Specification for the Design of Cold-Formed Steel Structural Members.

C. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.

D. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

E. Design structural elements under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

1.08 PROJECT CONDITIONS

A. Verify that field measurements are as indicated on shop drawings.

B. Coordinate work of this section with the placement of components within the stud framing system as specified in Section 09260 - Gypsum Board Assemblies.

1.09 DELIVERY, STORAGE AND HANDLING

A. Protect metal framing units from rusting and damage. Deliver to project site in manufacturer's unopened containers or bundles, fully identified with name, brand, type and grade. Store off ground in a dry ventilated space or protect with breathable waterproof tarpaulins.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Metal Framing:
   1. Bostwick Steel Framing Co.
   2. Dale Industries Inc.
   6. Milcor Division, Inryco Inc.
   11. Unimast Incorporated
   12. U.S. Gypsum Co

2.02 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.

2.03 FRAMING MATERIALS

A. System Components: With each type of metal framing and headers required, provide manufacturer's standard steel runners (tracks), blocking, bridging, lintels, clip angles, shoes, reinforcements, fasteners, and accessories as recommended by manufacturer for applications indicated, as needed to provide a complete metal framing system.

B. Materials and Finishes:
1. For 16-gage and heavier units, fabricate metal framing components of structural quality steel sheet with a minimum yield point of 40,000 psi; ASTM A 446, A 570, or A 611.
2. For 18-gage and lighter units, fabricate metal framing components of commercial quality steel sheet with a minimum yield point of 33,000 psi; ASTM A 446, A 570, or A 611.
3. Provide galvanized finish to metal framing components complying with ASTM A 653 for minimum G60 coating.
   a. Finish of installation accessories to match that of main framing components, unless otherwise indicated.

C. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
   1. Gage and depth: As required to meet specified performance levels.
   2. Galvanized in accordance with ASTM A653/A653M G60/Z180 coating.

D. Framing Connectors: Factory-made, formed steel sheet.
   1. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold Formed Steel Structural Members.
   2. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
      a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
      b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
   3. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

2.04 ACCESSORIES

A. Stud Wall Bridging: 1-1/2-inches x 16-gage Cold Rolled Channel, unless otherwise indicated, anchored to each stud with 16-gage clip angles, or welded connections (where allowed by manufacturer), and 16-gage splice plates, with spacing at 4'-0" or 4'-6" o.c. vertically, through pre-punched slots in studs.

B. Solid Joist Bridging: 1-5/8-inches x same gauge and depth as joists, unless otherwise indicated, anchored to joists webs with 2-inch x 2-inch x 16-gage clip angles, or welded (where allowed by manufacturer) with continuous rows spaced at mid-span minimum, or 5'-0" o.c. maximum at clear span where span exceeds 10'-0".

C. Strap Bracing: 1-1/2-inches x 20-gage galvanized steel, anchored at ends, splices, and each stud with typical framing screws. Placement at curved walls shall align with radius or curve indicated at each such location.

D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.05 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
B. Anchorage Devices: Powder actuated.
C. Anchorage Devices: Power actuated and Screws with sleeves.
E. Welding: In conformance with AWS D1.1 and AWS D1.3.

2.06 FABRICATION
A. General: Framing components may be prefabricated into assemblies before erection. Fabricate panels plumb, square, true to line, and braced against racking with joints welded. Perform lifting of prefabricated units to prevent damage or distortion.
B. Fabricate units in jig templates to hold members in proper alignment and position and to assure consistent component placement.
C. Fastenings: Attach similar components by welding. Attach dissimilar components by welding, bolting, or screw fasteners, as standard with manufacturer. Wire tying of framing components is not permitted.
   1. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
D. Fabrication Tolerances: Fabricate units to a maximum allowable tolerance variation from plumb, level, and true to line 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 (3 mm) 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 (3 mm).
E. Headers: Form from at least two equal size C-shapes in a back-to-back or box type configuration.

2.07 SHOP FABRICATED ASSEMBLIES
A. Shop fabricate metal framing to the greatest extent possible.
B. Fabricate assemblies of framed sections of sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.
C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verify that building framing components are ready to receive work.

3.02 INSTALLATION - GENERAL
A. Manufacturer's Instructions: Install metal framing system in accordance with manufacturer's current printed or written instructions and recommendations, unless otherwise indicated.
B. Runner Tracks:
   1. Install continuous tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure tracks at all walls anchored to concrete floor and roof structure with threaded studs in expansion shields spaced 18-inches o.c., unless otherwise indicated.
   2. Track shall be spliced with channel insert fastened with two (2) sheet metal screws, bolts or rivets at each side, each flange, each corner. Provide fasteners at corners and ends of tracks.
C. Set studs plumb, except as needed for diagonal bracing or required for non-plumb walls or warped surfaces and similar requirements.
D. Where stud system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners and bridging to supporting structure.
E. Install supplemental framing, blocking and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with stud manufacturer's recommendations and industry standards in each case, considering weight or loading resulting from item supported.
F. Erection Tolerances: Bolt or weld panels (at both horizontal and vertical junctures) to produce flush, even, true to line joints.
   1. Step in face and jog in alignment between panels not to exceed 1/16-inch.

3.03 INSTALLATION OF STUDS
A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.
B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners or by welding at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.
C. Place studs at 12 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using fastener method.
D. Frame wall openings larger than 2'-0" square with double stud at each jamb of frame except where more than two (2) are either shown or indicated in manufacturer's written instructions. Install cripple studs below and king studs and jack studs on each side/end of headers, minimum same size and gauge as wall studs where occurs, and anchor together securely. Install runner tracks and jack studs above and below headers at wall openings. Anchor tracks to jamb studs with stud shoes or by welding, and space jack studs same as full-height studs of wall. Secure stud system wall opening frame in manner indicated. Attach structural sheathing to each component.
E. Install horizontal bridging in all walls, and the additional strap bracing at curved walls as steel framing progresses. Install at spacing indicated and in compliance with stud manufacturer's written recommendations.
F. Frame both sides of expansion and control joints, with separate studs; do not bridge the joint with components of stud system
G. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
H. Install load bearing studs full length in one piece. Splicing of studs is not permitted.
I. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.
J. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
K. Install intermediate studs above and below openings to align with wall stud spacing.
L. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
M. Attach cross studs to studs for attachment of fixtures anchored to walls.
N. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
O. Touch-up field welds and damaged galvanized surfaces with primer.

3.04 FIELD QUALITY CONTROL

A. Testing (if required): All field quality-control testing shall be performed by a qualified independent testing agency. Refer to Section 01015 - “Special Conditions” and Section 01400 - "Quality Requirements" for additional information and requirements.
1. Field and shop welds will be subject to inspection and testing.
2. Testing agency will report test results promptly and in writing to Contractor and Architect.
3. Remove and replace Work that does not comply with specified requirements.
4. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

3.05 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

3.06 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Variation of any Member from Plane: 1/16 inch.

END OF SECTION 05400
PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Shop fabricated steel items.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 03300 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
C. Section 04810 - Unit Masonry Assemblies: Placement of metal fabrications in masonry.
D. Section 05520 - Handrails and Railings.
E. Section 09900 - Paints and Coatings: Paint finish.

1.03 REFERENCE STANDARDS
G. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2009.
H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.
K. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
M. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.04 DESCRIPTION OF WORK
A. Work described in this section includes metal fabrications, which include items made from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems specified elsewhere. Types of work in this section includes metal fabrications for:
1. Rough hardware.
2. Loose bearing and leveling plates.
3. Loose steel lintels.
4. Miscellaneous framing and supports.
5. Guard posts (bollards), with concrete fill and matching metal domed cap welded on post.
6. Anchor plates, channels and/or angles with anchor bolts; galvanized.

1.05 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
C. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
D. Samples: Submit representative samples of materials and finished products as may be requested by Architect.

1.06 QUALITY ASSURANCE
A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.07 PROJECT CONDITIONS
A. Field Measurements: Where fabrications are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
   1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabrication without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting acceptable to fabricator's professional engineer, and in a manner that will not affect structural performance, deflection, safety, etc.

1.08 COORDINATION
A. Coordinate installation of anchorages for metal fabrications and supports. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation, without delaying the work of this section or the Work of the project.

PART 2 - PRODUCTS
2.01 MATERIALS
A. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

2.02 MATERIALS - STEEL
A. Steel Sections: ASTM A36/A36M.
B. Steel Tubing: ASTM A500, Grade B cold-formed structural tubing.

C. Plates: ASTM A283.


E. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, galvanized to ASTM A153/A153M where connecting galvanized components.

F. Structural Steel Sheet: Hot-rolled, ASTM A 570; or cold-rolled ASTM A 611, Class 1; of grade required for design loading.

G. Galvanized Structural Sheet Steel: ASTM A 446, of grade required for design loading. Coating designation as indicated, or if not indicated, G90.

H. Steel Pipe: ASTM A 53; Type and grade (If applicable) as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (schedule 40), unless otherwise indicated.


J. Malleable Iron Castings: ASTM A 47, grade as selected by fabricator.

K. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

L. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153

M. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

N. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

O. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.03 MATERIALS - ACCESSORIES

A. Grout: Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE-CRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

B. Fasteners:
   1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.

C. Paint:
   1. Metal Primer Paint: Southern Coating "Heavy Duty RIP Primer 1-0900", Tnemec "10-99 Primer", or approved equivalent.
   2. Primer selected must be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Section 09900 - PAINTING.
   3. Galvanizing Repair Paint: High zinc dust content paint for re-galvanizing welds in galvanized steel, complying with Military Specifications MIL-P-21035 (Ships), or SSPC-Paint-20.
   4. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12, except containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.
2.04 FABRICATION
   A. Fit and shop assemble items in largest practical sections, for delivery to site.
   B. Fabricate items with joints tightly fitted and secured.
   C. Continuously seal joined members by continuous welds.
   D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
   E. Exposed Mechanical Fastenings (if any): Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
   F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.05 FABRICATED ITEMS
   A. Bollards: Steel pipe, concrete filled, crowned metal cap, as detailed; galvanized finish.
   B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
   C. Lintels: As detailed; galvanized finish.
   D. Miscellaneous framing and supports:
      1. Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required to complete work.
      2. Fabricate miscellaneous units to sizes, shapes and profiles shown or, if not shown, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
      3. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed. Except as otherwise shown, space anchors 24-inches o.c. and provide minimum anchor units of 1-1/4-inches wide x 1/4-inch x 8-inch long steel straps.
      4. Galvanize exterior miscellaneous frames and supports
   E. Rough hardware:
      1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in DIVISION 6 sections.
      2. Fabricate items of sizes, shapes and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.06 FINISHES - STEEL
   A. Prime paint all steel items.
      1. Exceptions: Galvanize items to be embedded in concrete or masonry and items specified for exterior finish.
      2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
   B. Prepare surfaces to be primed in accordance with SSPC-SP2.
C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

D. Surface Preparation:
   1. Prepare ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specification and environmental exposure conditions of installed metal fabrications:
   2. Exterior (SSPC Zone 1B): SSPC-SP6 "Commercial Blast Cleaning."
   3. Interiors (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning."

E. Prime Painting: One coat.

F. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements.

G. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

H. Lintels: Paint after galvanizing.

I. ASTM A 386 for galvanizing assembled steel products.

2.07 FABRICATION GENERAL

A. Workmanship:
   1. Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.
   2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32-inch unless otherwise shown. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
   3. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
   4. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown, or if not shown, Phillips flat-head (countersunk) screws or bolts.
   5. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
   6. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.
   7. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.

2.08 FABRICATION TOLERANCES

A. Squarness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.
PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal and aluminum where site welding is required.
B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.
C. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.
D. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete insets, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Install manufactured items in accordance with manufacturer's directions.
C. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
D. Field weld components indicated.
E. Perform field welding in accordance with AWS D1.1/D1.1M.
F. Obtain approval prior to site cutting or making adjustments not scheduled.
G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION 05500
SECTION 05520
HANDRAILS AND RAILINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Wall-mounted railings.
B. Handrailings not specified with stairs.
C. Free-standing railings at ramps, steps, or as noted.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 03310 - Concrete: Placement of anchors in concrete.
C. Section 04810 - Unit Masonry Assemblies: Placement of anchors in masonry.
D. Section 05500 - Metal Fabrications: Metal angles, and metal panel infill material.
E. Section 09900 - Paints and Coatings: Paint finish.

1.03 REFERENCE STANDARDS
B. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
D. SSPC-Paint 15 - Steel Joist Shop Paint; The Society for Protective Coatings; 1999 (Ed. 2004).

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer's product specifications and installation instructions for products and processes used in handrails and railings, including finishes and grout.
C. Shop Drawings shall indicate loading requirements as specified herein and be certified, sealed, and signed by a Registered Structural Engineer in the State in which the Project is located, to be in conformance with all requirements as specified herein and in accordance with all State and local codes and regulations.
   1. Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
   2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   3. Include the design engineer's stamp or seal on each sheet of shop drawings.
D. Samples: Submit samples for each type of metal finish indicated. Prepare samples on metal of same gauge and alloy to be used in work. Where normal color and texture variations are to be expected, provide "range" samples showing limits of such variations.
   1. Include samples of fittings and brackets proposed for use.
   2. Include sample of typical welded connection.
E. Samples: Submit two, 12 inch long samples of each type of handrail. Submit two samples of elbow, Tee, wall bracket, escutcheon, and end stop.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store handrails and railing systems in clean, dry location away from uncured concrete and masonry, protected against damage of any kind. Cover with waterproof tarpaulin or polyethylene sheeting; allow for air circulation inside the covering.

B. Refer to Division 1 Sections "Summary of Work" and "Special Conditions" for additional information and minimum requirements regarding stored materials.

PART 2 - PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

A. Structural Performance: Design, engineer, fabricate, and install the following metal fabrications to withstand the following structural loads without exceeding the allowable design working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each respective component of each metal fabrication.

1. Top Rail or Guard Rail: Design to be capable of withstanding the following loads:
   a. Concentrated load of 300 pounds applied at any point non-concurrently, vertically downward, or horizontally.
   b. Uniform load of 100 pounds per lineal foot applied non-concurrently, vertically downward, or horizontally.
   c. Concentrated and uniform loads above need not be assumed to act concurrently.

2. Handrails Not Serving as Top Rails or Guard Rails: Design to be capable of withstanding the following loads:
   a. Concentrated load of 200 pounds applied at any point non-concurrently, vertically downward, or horizontally.
   b. Uniform load of 50 pounds per lineal foot applied non-concurrently, vertically downward, or horizontally.
   c. Concentrated and uniform loads above need not be assumed to act concurrently.

3. Infill Area of Handrail and Screenwall System: Capable of withstanding a horizontal concentrated load of 200 pounds applied to one square foot at any point in the system including panels, intermediate rail balusters, or other elements composing the infill area.
   a. Above load need not be assumed to act concurrently with uniform horizontal loads on top rails of railing systems in determining stress on guardrails.

B. Dimensions: See drawings for configurations and heights.

1. Top Rail: Profile, as detailed.
2. Bottom Rail: Profile, as detailed.
3. Posts: Profile as detailed.
5. Infill: As detailed.
6. Pickets:
   a. Horizontal Spacing: Maximum 4 inches on center, unless shown otherwise.
   b. Top Mounting: Welded to underside of top rail.
   c. Bottom Mounting: Welded to bottom rail, unless otherwise indicated on drawings.
C. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
   1. For anchorage to concrete, provide inserts to be cast into concrete, for welding anchors.
D. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.02 STEEL RAILING SYSTEM
   A. Steel Tube: ASTM A 500, Grade B cold-formed structural tubing.
   B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, galvanized finish.
   C. Wall-Mounted Rails: Steel fabrications, as detailed.
   D. Top Rail: Steel fabrications, as detailed.
   E. Bottom Rail: Steel fabrications, as detailed.
   F. Infill: Metal panel infill material.
   G. Posts: As detailed.
   H. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
   I. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.
   J. Straight Splice Connectors: Steel concealed spigots.
   K. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 MISCELLANEOUS MATERIALS
   A. Nonshrink Nonmetallic Grout: Pre-mixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
   B. Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded, complying with applicable AWS Specifications, and as required for color match, strength, and compatibility in fabricated items.
   C. Fasteners:
      1. Use fasteners of same basic metal as the fastened metal, unless otherwise indicated. Do not use metals which are corrosive or incompatible with materials joined.
      2. Provide concealed fasteners for interconnection of handrail and railing components where welding is not feasible and for their attachment to other work, except where otherwise indicated.
   D. Anchors and Inserts: Provide anchors of proper type, size, and material for type of loading and installation condition shown, as recommended by manufacturer, unless otherwise indicated. Use non-ferrous metal or hot-dipped galvanized anchors and inserts for exterior locations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.04 FABRICATION
   A. Accurately form components to suit specific project conditions and for proper connection to building structure.
B. Fit and shop assemble components in largest practical sizes for delivery to site.
C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
D. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

2.05 FINISHES
A. Interior Railings: Shop primed, for Paint Finish:
   1. Preparation: Remove mill scale, and clean substrate in accordance with manufacturer's recommendations.
B. Exterior Railings: Shop primed, for Paint Finish:
   1. Preparation: Remove mill scale, and clean substrate in accordance with manufacturer's recommendations.
C. Finish Coats: See Section 09900 - PAINTS AND COATINGS.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION
A. Clean and strip primed steel items to bare metal where site welding is required.
B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.
C. Take field measurements prior to fabrication.

3.03 INSTALLATION
A. Fit exposed connections accurately together to form tight, hairline joints.
B. Perform cutting, drilling and fitting required for installation of handrails and railings. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
C. Install in accordance with manufacturer's instructions.
D. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
E. Anchor railings securely to structure.
F. Field weld anchors as indicated on shop drawings. Touch-up welds with primer. Grind welds smooth.
   1. Comply with applicable AWS specification for procedures of manual shielded metal-arc welding, for appearance and quality of welds made, and for methods used in correcting welding work. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth, fill, sand, apply cold-process galvanizing repair paint, and touch-up shop paint coat.
G. Conceal anchor bolts and screws whenever possible.
H. Adjust handrails and railings prior to anchoring to ensure matching alignment at abutting joints. Space posts at interval indicated, but not less than that required by design loadings.

3.04 ANCHORING POSTS
A. Anchor posts to metal surfaces with manufacturer's standard fittings designed for this purpose, unless otherwise indicated.
B. Anchor posts in concrete and stone by core drilling holes not less than 5" deep (excluding depth of stone veneer), and 3/4" greater than outside dimensions of posts. Clean holes of all loose material, insert posts and fill annular space between post and concrete with non-shrink, non-metallic grout, mixed and placed to comply with grout manufacturer's directions.
   1. Seal around rail penetration with pourable sealer, as specified in Section 07900 - Joint Sealers.
   2. Cover anchorage joint with flange or escutcheon plate attached to post after filling of annular space.

3.05 RAILING CONNECTIONS
A. Welded Connections: Use fully welded joints for permanently connecting railing components by welding. Cope or butt components to provide 100-percent contact or use manufacturer's standard fittings designed for this purpose.

3.06 ANCHORING RAILING ENDS
A. Anchor railing ends into concrete or masonry with manufacturer's standard fittings designed for this purpose, unless otherwise indicated.
B. Anchor railing ends to metal surfaces by welding using manufacturer's standard concealed fittings, unless otherwise indicated.
C. Expansion Joints: Provide expansion joints at locations indicated, or if not indicated, at intervals not to exceed 40 feet. Provide slip-joint internal sleeve, extending 2" beyond joint on either side; fasten internal sleeve securely to one side, locate joint within 6" of post.

3.07 ATTACHMENT OF HANDRAILS TO WALLS
A. General: Secure handrails to walls with manufacturer's standard wall brackets and end fittings, unless otherwise indicated.
B. For concrete and solid masonry, use drilled-in expansion shields and concealed hanger bolts, unless otherwise indicated.
C. For hollow masonry anchorage, use toggle bolts with square heads, unless otherwise indicated.
D. For stud partitions, use lag bolts fastened to 2 x 12 treated wood blocking between studs. Coordinate with spacing of studs for accurate location of blocking members.

3.08 TOLERANCES
A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.

3.09 PROTECTION
A. Protect finishes of railings and handrails from damage during construction period by use of temporary protection coverings approved by railing manufacturer. Remove protective covering at project completion or when directed by Architect.
B. Restore finishes damaged during installation and construction period so that no evidence remains of correction work. Return items which cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units as required.

C. Remove all burrs and uneven surfaces, fill gaps, and insure a smooth rail.

END OF SECTION 05520
SECTION 06100
ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Non-structural dimension lumber framing.
B. Rough opening framing for doors, windows, and roof openings.
C. Roof-mounted curbs.
D. Roofing nailers.
E. Roofing cant strips.
F. Preservative treated wood materials.
G. Fire retardant treated wood materials.
H. Communications and electrical room mounting boards.
I. Concealed wood blocking, nailers, and supports.
J. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 05500 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
C. Section 07620 - Sheet Metal Flashing and Trim: Sill flashings.
D. Section 09260 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011
E. PS 1 - Structural Plywood; 2009.
F. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2010.
G. RIS (GR) - Standard Specifications for Grades of California Redwood Lumber; Redwood Inspection Service; 2000.
H. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002.
I. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; West Coast Lumber Inspection Bureau; 2004, and supplements.
J. WWPA G-5 - Western Lumber Grading Rules; Western Wood Products Association; 2011.
1.04 SUBMITTALS
   A. See Section 01300 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide technical data on wood preservative materials and application instructions.
   C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
   B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS
   A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
      1. Species: Southern Pine, unless otherwise indicated.
      2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
      3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
   B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS
   A. Lumber grading agencies, and the abbreviations used to reference them, include the following:
      1. Northeastern Lumber Manufacturer's Association (NeLMA).
      2. National Lumber Grades Authority (NLGA).
      3. Redwood Inspection Service (RIS).
      4. Southern Pine Inspection Bureau (SPIB).
      5. West Coast Lumber Inspection Bureau (WCLIB).
      6. Western Wood Products Association (WWPA).
   B. Sizes: Nominal sizes as indicated on drawings, S4S.
   C. Moisture Content: S-dry or MC19.
   D. Joist, Rafters, and Small Beam Framing (2 by 6 through 4 by 16):
      1. Machine stress-rated (MSR) as follows:
         b. E (minimum modulus of elasticity): 1,600,000 psi.
      2. Species: Southern Pine, No. 2.
      3. Extent: As required, or indicated.
   E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
      1. Lumber: S4S, No. 2 or Standard Grade.
      2. Boards: Standard or No. 3.
2.03 EXPOSED BOARDS
A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
B. Moisture Content: Kiln-dry (15 percent maximum).
C. Surfacing: S4S.
D. Species: Southern Pine.
E. Grade: No. 2, 2 Common, or Construction.

2.04 CONSTRUCTION PANELS
A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
B. Other Applications:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.

2.05 ACCESSORIES
A. Fasteners and Anchors:
   1. Metal and Finish: AISI Type 304 or 316 Stainless steel for fire-retardant wood and preservative-treated wood locations; hot-dipped galvanized steel per ASTM A 153/ A 153M for rough carpentry exposed to weather, in ground contact, or area of high relative humidity; unfinished steel elsewhere. Acceptable to manufacturer of wood treatment materials and manufacturer of fasteners.
   2. Anchors: Toggle bolt type for anchorage to hollow masonry.
B. Metal Framing Anchors:
   1. General: Provide metal framing anchors of type, size, metal, and finish indicated that comply with requirements specified including the following:
      a. Current Evaluation/Research Reports: Provide products for which model code evaluation/research reports exist that are acceptable to authorities having jurisdiction and that evidence compliance of metal framing anchors for application indicated with the building code in effect for this Project.
      b. Allowable Design Loads: Provide products for which manufacturer publishes allowable design loads that are determined from empirical data or by rational engineering analysis and that are demonstrated by comprehensive testing performed by a qualified independent testing laboratory.
   2. Galvanized Steel Sheet: Steel sheet zinc-coated by hot-dip process on continuous lines prior to fabrication to comply with ASTM A 525 for Coating Designation G90 and with ASTM A 446, Grade A (structural quality); ASTM A 526 (commercial quality); or ASTM A 527 (lock-forming quality); as standard with manufacturer for type of anchor indicated.
      a. Use galvanized steel framing anchors for rough carpentry exposed to weather, in ground contact, or in area of high relative humidity, and all other locations, and at every point of bearing.
C. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
   1. For contact with preservative treated wood in exposed locations, provide minimum G185
galvanizing per ASTM A653/A653M.


G. Lag Bolts: ANSI B18.2.1.

H. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and where
indicated, flat washers.

2.06 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for
wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating
compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an
ALSC-accredited testing agency, certifying level and type of treatment in accordance with
AWPA standards.

B. Fire Retardant Treatment:
   1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated
and pressure impregnated; capable of providing a maximum flame spread rating of 25 when
tested in accordance with ASTM E84, with no evidence of significant combustion when test is
extended for an additional 20 minutes both before and after accelerated weathering test
performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and
15 percent for plywood.
      b. Do not use treated wood in direct contact with the ground.
   2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low
temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of
providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84,
with no evidence of significant combustion when test is extended for an additional 20 minutes.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and
15 percent for plywood.
      b. All interior rough carpentry items in buildings of Type I or Type II construction are to be
fire retardant treated.
      c. All concealed wood blocking, framing and sheathing in buildings of Type I or Type II
construction shall be fire retardant treated.
      d. Review Life Safety Sheets and provide fire retardant treated wood blocking in all rated
walls.
      e. Do not use treated wood in applications exposed to weather or where the wood may
become wet.

C. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B,
Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
   1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
a. Treat lumber exposed to weather.
2. Treat lumber in contact with roofing, flashing, or waterproofing.
3. Treat lumber in contact with masonry or concrete.
4. Treat lumber less than 18 inches above grade.
   a. Treat lumber in other locations as indicated.
5. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft retention.
   a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
   b. Treat plywood in contact with roofing, flashing, or waterproofing.
   c. Treat plywood in contact with masonry or concrete.
   d. Treat plywood less than 18 inches above grade.
   e. Treat plywood in other locations as indicated.

D. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA U1, Use Category UC4A, Commodity Specification A using waterborne preservative to 0.4 lb/cu ft retention.
1. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.
2. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.

2.07 ENGINEERED WOOD PRODUCTS
A. General: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that evidence compliance with building code in effect for Project.
1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent testing agency.

PART 3 - EXECUTION
3.01 PREPARATION
A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL
A. Select material sizes to minimize waste.
B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS
A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
B. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

E. Specifically, provide the following non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Chalkboards and marker boards.
   8. Wall paneling and trim.
   9. Joints of rigid wall coverings that occur between studs.

3.04 ROOF-RELATED CARPENTRY
   A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
   B. Provide wood curb at all roof openings except where specifically indicated otherwise. Form corners by alternating lapping side members.

3.05 INSTALLATION OF CONSTRUCTION PANELS
   A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
      1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
      2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
      3. Install adjacent boards without gaps.
      4. Size and Location: As indicated on drawings.

3.06 TOLERANCES
   A. Framing Members: 1/4 inch from true position, maximum.
   B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 CLEANING
   A. Waste Disposal: Comply with the requirements of Section 01500.
      1. Comply with applicable regulations.
      2. Do not burn scrap on project site.
      3. Do not burn scraps that have been pressure treated.
      4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.
   B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
   C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 06100
SECTION 06200
FINISH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Finish carpentry items.
B. Wood casings and moldings.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 06100 - Rough Carpentry: Support framing, grounds, and concealed blocking.
C. Section 06400 - Architectural Woodwork: Wood frames, countertops, etc.
D. Section 08211 - Flush Wood Doors.
E. Section 09900 - Paints and Coatings: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS
A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.
B. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; Hardwood Plywood & Veneer Association; 2009.
C. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements for submittal procedures.
B. Product Data:
   1. Provide instructions for attachment hardware.
C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot.
   2. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.
D. Samples: Submit two samples of finish plywood, 8x8 inch in size illustrating wood grain and specified finish.
E. Samples: Submit two samples of wood trim 6 inch long.

1.05 QUALITY ASSURANCE
A. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Premium grade.
B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.06 REGULATORY REQUIREMENTS
A. Conform to applicable code for fire retardant requirements.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Protect work from moisture damage.
1.08 PROJECT CONDITIONS
   A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
   B. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

PART 2 - PRODUCTS

2.01 MATERIALS - GENERAL
   A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI Architectural Woodwork Quality Standards Illustrated for Premium Grade.

2.02 WOOD-BASED COMPONENTS
   A. Wood fabricated from old growth timber is not permitted.

2.03 LUMBER MATERIALS
   A. Softwood Lumber: SYP species, maximum moisture content of 6 percent.
   B. Hardwood Lumber: white or yellow poplar species (coordinate with other wood trim), maximum moisture content of 6 percent.

2.04 SHEET MATERIALS
   A. Softwood Plywood: PS 1 Grade A-B; Veneer core; SYP face species, (or similar species permitted by reference standards).
   B. Hardwood Plywood: HPVA HP-1, Grade AA, Type I at exterior, Type II at Interior; Veneer core, type of glue recommended for application; Natural Birch face species, Rotary cut.

2.05 PLASTIC LAMINATE MATERIALS
   A. Plastic Laminate: NEMA LD 3, HGS; color as selected; finish as selected.

2.06 ADHESIVE
   A. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

2.07 FASTENINGS
   A. Fasteners: Of size and type to suit application; galvanized finish in concealed locations and stainless steel finish in exposed locations.
   B. Concealed Joint Fasteners: Threaded steel.

2.08 ACCESSORIES
   A. Lumber for Shimming, Blocking: Softwood lumber of SYP species.
   B. Primer: Alkyd primer sealer.
   C. Wood Filler: Solvent base, tinted to match surface finish color.

2.09 FABRICATION
   A. Shop assemble work for delivery to site, permitting passage through building openings.
   B. Cap exposed plastic laminate finish edges with material of same finish and pattern.
   C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
D. 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.

2.10 SHOP FINISHING
A. Sand work smooth and set exposed nails and screws.
B. Apply wood filler in exposed nail and screw indentations.
C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
D. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 5 - Finishing for Grade specified and as follows:
   1. Transparent:
      a. System - 1, Lacquer, Nitrocellulose.
      b. Sheen: Flat.
   2. Opaque:
      a. System - 1, Lacquer, Nitrocellulose.
      b. Color: As selected by Architect.
      c. Sheen: Flat.
E. Prime paint surfaces in contact with cementitious materials.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verify adequacy of backing and support framing.

3.02 INSTALLATION
A. Install work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards requirements for grade indicated.
B. Set and secure materials and components in place, plumb and level.
C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
D. Install trim with wall adhesive by gun application.
E. Match grains and color so that individual pieces do not stand out.

3.03 PREPARATION FOR SITE FINISHING
A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
B. Site Finishing: See Section 09900.
C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.04 TOLERANCES
A. Maximum Variation from True Position: 1/16 inch.
B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06200
SECTION 06400
ARCHITECTURAL WOODWORK

PART 1 - GENERAL
1.01 SECTION INCLUDES
A. Laminate clad countertops.
B. Wood cabinets.
C. Closet and utility shelving (paint on site, under Section 09900).
D. Wood frames, sidelights, panels, base, window sills, and miscellaneous trim (paint on site, under Section 09900), stained (transparent finish) or painted (opaque finish) where indicated.
E. Hardware for architectural woodwork.
F. Related work and trim for above items.
G. Extent of each type of architectural woodwork is indicated on drawings and in schedules.
H. Architectural woodwork and components for opaque finish are intended to be finish painted on-site, under Section 09900.
I. Architectural woodwork and components for natural, stained and/or transparent finish are intended to be painted in woodwork fabricator's shop under controlled conditions, under the work of this Section.

1.02 RELATED DOCUMENTS
A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
B. Related work specified elsewhere includes:
   1. Section 06100 - Rough Carpentry.
   2. Section 06200 - Finish Carpentry.
   4. Section 09900 - Paints And Coatings.
   5. Section 12345 - Plastic Laminate Casework.

1.03 SUBMITTALS:
A. Shop Drawings: Submit shop drawings showing location of each item, dimensioned plans and elevations, large scale details, attachment devices and other components.
   1. Manufacturer's current and complete product data, for manufactured units of work, including color selection data and samples; and design load capacities for wood columns, and their plinths and anchorage systems.
B. Samples: Submit the following samples:
   1. Lumber and panel products with or for transparent finish; 6-inches x 3/4-inch x 18-inches, for each species and cut, finished on 1-side and 1-edge.
   2. Exposed Cabinet Hardware Support Hardware: One unit of each type and finish, which will be returned for use on the project, upon request by the Contractor.
   3. Plastic Laminate Products: Manufacturer's standard samples, approximately 4-inches x 4-inches, with finish as required for this project, and representative color range anticipated.

1.04 QUALITY ASSURANCE:
A. AWI Quality Standard: Comply with applicable requirements of "Architectural Woodwork Quality Standards" published by the Architectural Woodwork Institute (AWI), except as otherwise indicated.
B. Fabricator Qualifications: Fabricators shall be experienced firms specializing in the types of architectural woodwork required for this project for at least 5-verifiable years and on at least 10-verifiable projects of similar size, scope, complexity, and quality as this project.

C. Installer Qualifications: Arrange for installation of architectural woodwork by the fabricator, or by a firm under the control and direction of the fabricator, which can demonstrate at least 5-verifiable years successful experience in installing architectural woodwork items on at least 5-verifiable projects, similar in type and quality to those required for this project.

1.05 DELIVERY, STORAGE, AND HANDLING:
A. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

B. Do not deliver woodwork, until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, woodwork must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.06 PROJECT CONDITIONS:
A. Conditioning: Woodwork Manufacturer and Installer shall advise Contractor of temperature and humidity requirements for woodwork installation and storage areas. Do not install woodwork until required temperature and relative humidity have been stabilized and will be maintained in installation areas.

B. Maintain temperature and humidity in installation area as required to maintain moisture content of installed woodwork within a 1.0-percent tolerance of optimum moisture content, from date of installation through remainder of construction period. Require Woodwork Manufacturer to establish optimum moisture content and required temperature and humidity conditions.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:
A. Wood Cabinet Manufacturers: Subject to compliance with requirements, provide premium grade, custom made cabinets and woodwork from a millwork shop complying with requirements of "Quality Assurance" article above.

B. Plastic Laminate Manufacturer: Subject to compliance with requirements, provide solid, stippled, textured, and/or patterned high pressure decorative laminates of one of the following:
   1. Wilsonart International.
   2. Formica Corporation.

2.02 FABRICATION, GENERAL:
A. Wood Moisture Content: Comply with requirements of referenced quality standard for moisture content of lumber at time of fabrication and for relative humidity conditions in the installation areas.

B. Fabricate woodwork to dimensions, profiles, and details indicated with dowel, dado, glue and screw construction, with openings and mortises precut, where possible, to receive hardware and other items and work.
   1. Ease edges to a 1/16-inch radius, for corners of cabinets and edges of solid wood (lumber) members less than 1-inch in nominal thickness, 1/8-inch radius for edges of rails and similar members over 1-inch in nominal thickness.
C. Complete fabrication, assembly, hardware application, and other work before shipment to project site to 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.

D. Pre-Cut Openings: Fabricate architectural woodwork with pre-cut openings, where possible, to receive hardware, appliances, plumbing fixtures, electrical work and similar items. Locate openings accurately and use templates or roughing-in diagrams for proper size and shape. Smooth edges of cutoffs and, where located in countertops and similar exposures seal edges of cutouts with a water-resistant coating.

E. Measurements: Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain field measurements and verify dimensions and shop drawing details as required for accurate fit. A tight fit of less than 1/8-inch is expected.

F. Products in this Section shall be constructed only of materials that are formaldehyde-free.

2.03 FIRE-RETARDANT MATERIALS:

A. Where fire-retardant treated lumber is indicated, provide materials which are pressure impregnated with fire-retardant chemicals and comply with the following requirements:
   1. As required to comply with referenced standards and finish classifications necessary as per the Standard Building Code, NFPA 101 - Life Safety Code, authorities having jurisdiction, and acceptable in all respects for indoor use and finish requirements.
   2. Fire-Retardant Chemicals: Use chemicals of type and for applications indicated which do not bleed-through or otherwise adversely affect finishes. Do not use colorants in solution to distinguish treated lumber from untreated lumber.

B. Fire Performance Characteristics: Provide materials which are identical to those tested per ASTM methods and time periods indicated, are marked and listed for fire performance characteristics by Underwriters Laboratories, Inc., or other testing and inspecting agency acceptable to authorities having jurisdiction, and comply with the following requirements:
   1. Mill lumber after treatment, within limits set for wood removal which does not affect listed fire performance characteristics, using a woodworking plant certified by testing and inspecting agency.

C. Marking: Identify treated lumber with separable paper classification marking of inspecting and testing agency, unless otherwise indicated.

D. Surface Burning Characteristics: Not exceeding values required by latest edition of the "Standard Building Code" and "NFPA 101" (with amendments), tested per ASTM E 84 for standard time period.
   1. Flame Spread: Per Code.
   2. Smoke Developed: Per Code.

E. Kiln-dry woodwork after treatment to levels required for non-fire-retardant treated woodwork materials. Maintain moisture content required by kiln drying, before and after treatment.
   1. Discard treated lumber which does not comply with requirements of referenced woodworking standard. Do not use twisted, warped, bowed, discolored, or otherwise damaged or defective lumber.

2.04 STANDING AND RUNNING TRIM:

A. Quality Standard: Comply with AWI Section 300.
B. Rout or groove backs of flat trim members, kerf backs of other wide flat members, except for members with ends exposed in finished work.

C. Assemble Casings in plant except where limitations of access to place of installation require field assembly.

D. Interior Trim for Transparent Finish (typical finish unless specifically indicated otherwise): Comply with the following requirements:
   1. Grade: Premium, Grade I.
   2. Lumber Species: Select White Birch.
   3. Cut: Plain Sliced.
   4. Locations: Provide stained transparent finish within rooms which have new woodwork with transparent finish, unless indicated otherwise.

E. Interior Trim for Opaque Finish (only where specifically indicated, if any): Comply with the following requirements:
   1. Grade: Custom, Grade II.
   2. Lumber Species: Any closed-grain hardwood listed in referenced woodworking standard.
   3. Cut: Plain or Rotary cut.
   4. Locations: Provide opaque finish within rooms which have new woodwork with opaque finish, unless indicated otherwise.

2.05 ARCHITECTURAL COUNTER TOPS:

A. Quality Standard: Comply with applicable 400 and its Divisions 400B and 400C.

B. Type of Top - Laminate Clad:
   1. Grade: Premium; Grade I.
   2. Edge Treatment: Refer to Drawings.
   3. Core: Minimum 47-lb. density particle board, except at least 3/4-inch A-B plywood with exterior glue (approved for interior use), at tops with sinks and/or plumbing fixtures.

2.06 CABINET HARDWARE AND ACCESSORY MATERIALS:

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items which are specified in Section 08710 - Finish Hardware.

B. Cabinet Hardware Schedule: Refer to schedule at end of this section for cabinet hardware required for architectural cabinets.

C. Hardware Standard: Comply with ANSI/BHMA A156.9 "American National Standard for Cabinet Hardware" for items indicated by reference to BHMA numbers or referenced to this standard.

D. Hardware Finishes: Comply with BHMA 1301 for finishes indicated by BHMA Code Numbers or if not otherwise indicated, provide finishes complying with requirements indicated.
   1. For exposed hardware comply with requirements indicated for finish and base indicated at the end of this Section.
   2. For concealed hardware provide manufacturer's standard finishes which comply with product class requirements of ANSI/BHMA A156.9, and which match exposed hardware on same cabinet unit.

2.07 CLOSET AND UTILITY SHELVING:

A. Quality Standard: Comply with AWI Section 600.
B. Shelving for Opaque Finish: Comply with the following requirements:
   1. Grade: Custom.
   2. Shelving Material: Birch faced veneer core plywood.
   4. Thickness: 1-inch at wood shelves, unless indicated otherwise

C. Shelving for Transparent Finish: Comply with the following requirements:
   1. Location: Only in rooms where specifically indicated on Drawings.
   2. Grade: Premium.
   3. Species: AWI Veneer Grade A, Select Red Oak, or White or Yellow Poplar, Rotary Cut (unless scheduled otherwise).
   4. Thickness (plywood): 1-inch (minimum), with solid wood nosing.
   5. Lumber for shelving, only where indicated on the Drawings: 5/4-inch with nosings as indicated.

2.08 CLOSET AND UTILITY SHELVING HARDWARE:
   A. Adjustable Shelf Standards and Related Supports:
      1. Provide standards and supports of type indicated, with matching finish on fasteners and accessories.
      2. Horizontal Slotted Type:
         a. Mortise mounted, 5/8-inch wide x 3/16-inch high x length indicated, plated steel.
         b. Equivalent to K & V No. 255, BRN.
      3. Support Type:
         a. Closed shelf rest, bronze plated steel.
         b. Equivalent to K & V No. 256, BRN.
      4. Closet Hanger Rod and Support:
         a. Rod: Equivalent to K&V No. 770-1.
         b. Supports: Equivalent to K&V No. 734 and No. 735, one (1) each per rod.

2.09 FASTENERS AND ANCHORS:
   A. Screws: Select material, type, size and finish required for each use. Comply with FS FF-S-111 for applicable requirements.
   B. Nails: Select material, type, size and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
   C. Anchors: Select material, type, size and finish required by each substrate for secure anchorage. Provide non-ferrous metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion-resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.

2.10 FINISHING OF INTERIOR ARCHITECTURAL WOODWORK:
   A. Quality Standard: Comply with AWI Section 1500, unless otherwise indicated.
   B. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing of concealed surfaces and similar preparations for finishing of architectural woodwork, as applicable to each unit of work.
   C. Melamine cladded interiors for wood cabinets: To match HPDL.

2.11 ARCHITECTURAL WOOD VENEER CABINETS:
   A. Quality Standard:
1. Comply with AWI Section 400 and its Divisions 400B and 400C.
2. Grade: Premium.
3. Design: Flush overlay European style with concealed adjustable hinges, and as otherwise indicated on the Drawings.

B. Wood Veneer Cladding: As follows:
1. Grade: Premium, Grade I.
2. Lumber Species: Select White Birch, unless scheduled otherwise.
3. Cut: Plain sliced.

C. Hardboard: AHA A135.4 (tempered).

D. Core Materials:
1. MR Moisture Resistant Medium Density Fiberboard: Average 47-pound density grade, ANSI A208.2.

PART 3 - EXECUTION

3.01 PREPARATION:
A. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.

B. Pre-Installation Meeting: Meet at project site prior to delivery of architectural woodwork and review coordination and environmental controls required for proper installation and ambient conditioning in areas to receive work. Include in meeting the Contractor; Architect and other Owner Representatives (if any); Installers of architectural woodwork, wet work such as plastering, other finishes, painting, mechanical work and electrical work; and firms or persons responsible for continued operation (whether temporary or permanent) of HVAC system as required to maintain temperature and humidity conditions. Proceed with woodwork installation only when everyone concerned agrees that required ambient conditions can be maintained.

C. Deliver concrete inserts and similar anchoring devices to be built into substrates, well in advance of time substrates are to be built.
   1. Coordinate location and placement of concealed treated blocking (by others) prior to finish materials installations.

D. Prior to installation of architectural woodwork, examine shop fabricated work for completion, and complete work as required, including back priming and removal of packing.

3.02 INSTALLATION:
A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.

B. Install woodwork plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8'-0" for plumb and level (including tops); and with no variations in flushness of adjoining surfaces.

C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
   1. Seal all hardware cuts, routed slots, etc., before installation of hardware.

D. Anchor woodwork to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fasteners heads are required, use fine
finishing nails for exposed nailing, countersunk and filled flush with woodwork, and matching final finish where transparent finish is indicated.

E. Standing and Running Trim, and Sills: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners and comply with referenced Quality Standards for joinery.

F. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated. Maintain veneer sequence matching (if any) of cabinets with transparent finish.
1. Install cabinets with no more than 1/8-inch in 96-inches sag, bow, or other variation from a straight line.

G. Wood Storage Shelving: Complete the assembly of units and install in the areas indicated, including hardware and accessories as indicated.

H. Tops: Anchor securely to base units and other support systems indicated. Caulk space between backsplash and wall with specified sealant.
1. Install countertops with no more than 1/8-inch in 96-inches (3 mm in 2400-mm) sag, bow, or other variation from a straight line.

I. Wood Panels: Anchor panels to supporting substrate with concealed panel-hanger clips and by blind nailing on backup strips, splined-connection strips, and similar associated trim and framing. Do not face nail unless otherwise indicated.
1. Install flush panels with no more than 1/16-inch in 96-inches vertical cup or bow and 1/8-inch in 96-inches horizontal variation from a true plane.

J. Refer to Section 09900 - Paints And Coatings, for final finishing of installed architectural woodwork which is indicated to be painted on-site.

3.03 ADJUSTMENT, CLEANING, FINISHING, AND PROTECTION:

A. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate and adjust hardware.

C. Clean woodwork on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

D. Complete the finishing work specified as work of this section, to whatever extent not completed at shop or prior to installation of woodwork.

E. Provide final protection and maintain conditions, in a manner acceptable to Fabricator and Installer, which ensures architectural woodwork being without damage or deterioration at time of substantial completion.

3.04 CABINET HARDWARE SCHEDULE:

A. General: Subject to requirements and finishes stated above, furnish the following items in quantities and at locations indicated, by named manufacturers or equivalent products acceptable to Architect.
1. Cabinet hardware shall be Brushed Nickle finish.

B. General: Finish shall match hardware finish specified in Section 08710 - Finish Hardware in room(s) where occurs.
1. Design intent is to have all hardware in matching finish in all locations.
C. Cabinet Hinges: Equivalent to 5-knuckle exposed self-closing hinges as manufactured by Julius Blum, Inc., Grass or Stanley.
   1. Finish shall match hardware finish specified in Section 08710 - "Finish Hardware" in room(s) where occurs.

D. Cabinet Door and Drawer Pulls:
   1. Wire pulls, equivalent to Stanley No. 4484, (ANSI B12012), 4-inches long, with 1-inch clearance; Pull design shall comply with the Americans with Disability Act (ADA).
      a. Finish shall match hardware finish specified in Section 08710 - Finish Hardware.

E. Cabinet Door Catches: Manufacturer's standard 2-screw sill mounted unit made of molded nylon, lipped over sill to form bumper and hold in place, with 2-screw mounted heavy door mounted unit with nylon roller; provide spring-mounted units where required.
   1. Acceptable Manufacturers: Any of manufacturers listed for other cabinet hardware.

F. Drawer Slides: Heavy Duty, non-corrosive (galvanized) full extension ball bearing slides rated at 100-pounds, with positive stop, and self-closing and lift-out disconnect features; Model No. 1429, as manufactured by Knape & Vogt, or equivalent by Blum or Grant.
   1. At legal size drawers, use K&V No. 1483 or equivalent, rated at 150-pounds, with same features as noted above.

G. Shelf Standards: Manufacturer's standard steel units with anchors and supports 5/8-inch wide x 3/16-inch high, adjustable on 1/2-inch centers; Series 255, as manufactured by K&V, or equivalent by Grant or Stanley.
   1. Wood Cabinets: Model No. 255 BRN with No. 256 BRN supports and matching fasteners.
   2. Omit standards where fixed shelves are indicated.
   3. All standards to be recess mounted (flush in routed dados), unless specifically indicated otherwise.

END OF SECTION 06400
SECTION 07212
BOARD AND BATT INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Batt insulation and vapor retarder in walls where indicated, and over interior ceiling construction.
B. Batt insulation in walls where indicated.
C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 05400 - Cold Formed Metal Framing: Board insulation as wall sheathing.
C. Section 07240 - Exterior Insulation and Finish System: Board insulation on exterior side of walls, finished with weatherproof coating.
D. Section 09260 - Gypsum Board Assemblies: Supporting structure for batt insulation.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.05 FIELD CONDITIONS
A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 - PRODUCTS

2.01 APPLICATIONS
A. Insulation in Metal Framed Walls: Batt insulation with no vapor retarder.
B. Insulation Above Ceilings: Batt insulation with no vapor retarder.

2.02 BATT INSULATION MATERIALS
A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor's option.
B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
   2. Formaldehyde Content: Zero.
   3. Thermal Resistance: R of 30, unless indicated otherwise.
4. Thickness: As required to meet the following requirements:
   c. Interior walls: Thickness of Studs.
5. Facing: Unfaced.
6. Manufacturers:
C. Mineral Fiber Batt Insulation (Sound attenuation blankets or similar wording): Flexible preformed batt or blanket, complying with ASTM C 665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E 84.
   1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
   2. Formaldehyde Content: Zero.
   3. Thickness: As required to meet the following requirements:
      c. Interior walls: Thickness of Studs.
4. Manufacturers:
   d. Substitutions: See Section 01600 - Product Requirements.

2.03 ACCESSORIES
A. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.
B. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

3.02 BATT INSTALLATION
A. Install insulation in accordance with manufacturer's instructions.
B. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
C. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
D. Place insulation batts on top of ceiling tiles.

3.03 PROTECTION
A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07212
SECTION 07620
SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Fabricated sheet metal items, including flashings and counterflashings.
   B. Self-Adhering Flashing.

1.02 RELATED REQUIREMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
   B. Section 01400 - Quality Requirements: General requirements for mock-ups.
   C. Section 04810 - Unit Masonry Assemblies: Through-wall flashings in masonry.
   D. Section 06100 - Rough Carpentry: Wood nailers.
   E. Section 07900 - Joint Sealers.

1.03 REFERENCE STANDARDS
   F. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2012.

1.04 SUBMITTALS
   A. See Section 01300 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
   C. Samples: Submit two samples 6x6 inch in size illustrating metal finish color.

1.05 QUALITY ASSURANCE
   A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.
   B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of experience.
   C. Single-Source Responsibility: Self-adhering flashings at rough openings shall be manufactured by manufacturer of water/air barrier coating specified in Section 07140 - Fluid-Applied Waterproofing, for material compatibility and single-source manufacturing responsibility.
1.06 DELIVERY, STORAGE, AND HANDLING
   A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation.  Slope metal sheets to ensure drainage.
   B. Prevent contact with materials that could cause discoloration or staining.

PART 2 - PRODUCTS

2.01 SHEET MATERIALS
   A. Aluminum-zinc alloy coated steel sheet ("Galvalume") conforming to ASTM A792/ A 792M; minimum AZ50 coating, with minimum 50,000 p.s.i. yield.
      1. Finish: 3-coat full strength (70-percent) Kynar 500 resin (20 year) finish.
         a. Color: As selected by Architect from Manufacturer's standard colors.
      2. Thickness: minimum 24-gauge.
   B. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal.
   C. Lead: ASTM B749, 2.5 lb/sq ft thick.
   D. Self-Adhering Flashing - Around Windows, Doors, and Critical Wall Penetrations: Self-adhesive, rubberized asphalt bonded to polyethylene film, cold applied tape, with silicone-coated release sheet; 40 mil thickness; 12" wide roll, or as required. Provide primer when recommended by flashing manufacturer.

2.02 ACCESSORIES
   A. Fasteners: Galvanized steel, with soft neoprene washers.
   B. Primer: Zinc chromate type.
   C. Sealant: Type specified in Section 07900.
   D. Plastic Cement: ASTM D4586, Type I.
   E. Solder: ASTM B32; Sn50 (50/50) type.

2.03 FABRICATION
   A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
   B. Form pieces in longest possible lengths.
   C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
   D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
   E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
   F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

PART 3 - EXECUTION

3.01 EXAMINATION
   A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

B. Apply plastic cement compound between metal flashings and felt flashings.

C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

D. Seal metal joints watertight.

E. Install continuous through-wall flashing and sub-sill flashing with interior end dam prior to setting doors and windows. Typical at head and sill conditions. Jamb flashing to terminate in sub-sill flashing. Install metal head flashing at all window and door heads per manufacturer's standard detail.

F. Apply self-adhered flashing in accordance with manufacturer's recommendations.

END OF SECTION 07620
SECTION 07840
FIRESTOPPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Work described in this Section includes:
   1. Through penetration firestopping in fire rated construction.
   2. Construction-gap firestopping at connections of the same materials and different materials in fire rated construction.
   3. Construction-gap fire stopping occurring within fire rated wall, floor, floor-ceiling, and/or roof-ceiling assemblies.
   4. Construction-gap firestopping at the top of fire rated walls.
   5. Through-penetration smoke-stopping in smoke partitions.

B. Related work Specified elsewhere includes:
   1. For structural, finish, and fire protection materials: Refer to the appropriate Specifications Sections.
   2. Fire dampers and manufactured devices: Refer to Division 15.
   3. Raceway seals and manufactured electrical devices: Refer to Division 16.

C. Unless specifically indicated otherwise, the party, trade, or subcontractor whose work penetrates fire-rated construction and/or fire-rated assemblies, shall be responsible for firestopping around their own penetrations.

D. In the event the General Contractor employs a Specialty Subcontractor for the required firestopping work, they shall notify all prospective Bidders, so as to avoid duplication in pricing.
   1. The Specialty Subcontractor shall provide coordination of requirements and the related work of other trades in advance of and as the Work progresses.

1.03 REFERENCED STANDARDS

A. Underwriters Laboratories - U.L. Fire Resistant Directory:
   1. Through-penetration fire stop devices (XHCR).
   2. Fire resistant ratings (BXUV).
   3. Through-penetration firestop systems (XHEZ).
   4. Fill, void, or cavity material (XHHW).

B. American Society for Testing and Materials Standards:

C. Underwriters Laboratories, Inc.:
   1. UL 1479: Fire Tests of Through-Penetration Firestops.
   2. UL 723: Surface Burning Characteristics of Building Materials.
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 floor-ceiling and roof-ceiling assemblies, and structural floors and walls.

C. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire, gasses, 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 metal 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.

1.05 SYSTEM DESCRIPTION

A. Design Requirements:
   1. Fire Rated Construction: Maintain barrier and structural floor fire ratings including resistance to cold smoke at all penetrations, connections with other surfaces and/or types of construction, at separations required to permit building movement and sound and/or vibration absorption, and at other construction gaps.
   2. Smoke Barrier Construction: Maintain barrier and structural floor resistance to cold smoke at all penetrations, connections with other surfaces and types of construction and at all separations required to permit building movement and sound and/or vibration absorption, and at other construction gaps.

1.06 SUBMITTALS

A. Submit in accordance with General Conditions, Division 1, and Section 01015 - “Special Conditions,” unless specifically indicated otherwise.

B. Product Data: Manufacturer’s written specifications and technical data including the following:
   1. Detailed specifications of construction and fabrication.
   2. Manufacturer’s current written installation instructions.
   3. Summary of test data for each product intended for use and limitations. Include name and address of the required independent testing laboratory and compliances obtained.

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 manufacturers representative shall provide qualified engineering judgments and drawings relating to non-standard applications as needed.

D. Quality Control Submittals: Statement of qualifications.
E. Applicators’ Qualifications Statement: List past projects indicating required experience.

1.07 QUALITY ASSURANCE

A. Specialty Contractor’s Qualifications: Firm experience 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, and to State, Local, and/or other authority having jurisdiction, where applicable.
   2. At least 2-years experience with systems intended for use.
   3. Successfully completed at least five projects of similar size, scope, and complexity using the systems intended for use.

B. Local and State Regulatory Requirements: Submit forms or acceptance for proposed assemblies not conforming to specific UL Firestop System Numbers or UL classified devices and/or systems.

C. Materials shall have been tested to provide fire rating at least equal to that of the construction.

1.08 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping: 
   1. Deliver products in original unopened packaging with legible manufacturer’s identification.
   2. Coordinate delivery with scheduled installation date, so as to allow minimum storage at site.

B. Storage and Protection: Store materials in a clean, dry, ventilated interior location. Store materials off of floor, and protect from soiling, abuse, moisture, and freezing. Follow manufacturer’s written instructions when more stringent.

C. Remove damaged and/or contaminated materials immediately, legally dispose of off site, and Replace, at Contractor’s expense.

1.09 PROJECT CONDITIONS

A. Existing Conditions: 
   1. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding with work.
   2. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.

B. Environmental Requirements: 
   1. Furnish adequate ventilation if using solvents.
   2. Furnish forced air ventilation during installation if required by manufacturer and/or authorities having jurisdiction.
   3. Keep Flammable materials away from sparks or flame.
   4. Provide masking or drop cloths to prevent contamination of adjacent surfaces by firestopping materials.
   5. Comply with manufacturer’s written 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, co-adhesion, abrasive resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, and/or general durability, and/or which appear to deteriorate in any other manner not clearly specified by submitted manufacturer’s data as an inherent quality or characteristic of the material for the exposure indicated. The guarantee period shall be for 1-year from the date of “Substantial Completion.”
PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS AND PRODUCTS

A. Use only those listed in the UL Fire Resistance Directory for the UL System involved.
B. Products shall be as manufactured by one of the following, or pre-approved equivalent:
   1. Dow Corning.
   2. HILTI.
   3. 3M Fire Protection Products.
   5. Rector Seal Corp.
C. All firestopping products must be from a single manufacturer.
D. All trades shall use products from the same manufacturer.

2.02 THROUGH-PENETRATION FIRESTOPPING OF FIRE-RATED CONSTRUCTION

A. Systems or devices listed in the UL Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that they conform 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.
   1. Additional requirements: Withstand the passage of cold smoke either as an inherent property of the system, or by the use of a separate product included as a part of the UL system or device, and designated to perform this function.

2.03 CONSTRUCTION-GAP FIRE STOPPING OF FIRE-RATED CONSTRUCTION

A. Firestopping at construction gaps between edges of floor slabs and exterior wall construction.
B. Firestopping at construction gaps between tops of partitions and under side of structural systems.
C. Firestopping at construction gaps between tops of partitions and underside of fire-rated ceiling or ceiling assembly.
D. Firestopping of control joints in fire rated masonry partitions.
E. Firestopping expansion joints.
F. Acceptable manufacturers and products: Use only those listed in the UL Fire Resistant Directory for the UL System involved.

2.04 SMOKE STOPPING AT SMOKE PARTITIONS

A. Through-penetration smoke-stopping: Any system complying with the requirements for through-penetration firestopping in fire-rated construction, as specified in the “Referenced Standards” is acceptable, provided that the system includes the specified smoke seal or will provide a smoke seal. The length of time of the fire resistance may be disregarded, as applicable.
B. Construction-gap smoke-stopping: Any system complying with the requirement for construction-gap firestopping in fire-rated construction, as specified in the “Referenced Standards” is acceptable, provided that the system includes the specified smoke seal or will provide the smoke seal. The length of time of the fire resistance may be disregarded, as applicable.
2.05 ACCESSORIES
   A. Fill, void, and cavity materials: As classified under category XHHW in the UL Fire Resistance Directory.
   B. Forming materials: As classified under category XHKU in the UL Fire Resistance Directory.

PART 3 - 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. Notify the General Contractor of such conditions.
      1. Verify barrier penetrations are properly sized and in suitable conditions for application of materials.
      2. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 PREPARATION AND CLEANING
   A. Clean surfaces to be in contact with penetration seal materials, of dirt, grease, oil, loose materials, rust or other substances, that may effect proper fitting, adhesion, or the required fire resistance.

3.03 INSTALLATION
   A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer’s written instructions and recommendations.
   B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
   C. Where floor openings without penetrating items are more than 4-inches in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as required for floor system.
   D. Protect materials from damage on surfaces subject to traffic.
   E. Place firestopping in annular space around fire dampers before installation of damper’s anchoring flanges, which are to be installed in accordance with fire damper manufacturer’s written recommendations, unless specifically indicated otherwise.
   F. Where large openings are created in walls, or floors to permit installation of pipes, ducts, cable tray, bus duct, or other items, close unused portions of opening with firestopping material tested for the application.
   G. Install smoke firestopping as specified for firestopping.
   H. 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 intervals of 15'-0" on center.

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 the Architect, building inspector, fire inspector, and/or other authority having jurisdiction.
   C. Perform under this Section patching and repairing of firestopping caused by cutting or penetration by other trades, and/or by any other cause.

3.05 ADJUSTING AND CLEANING
   A. Immediately clean-up spills of liquid components.
B. Neatly cut and trim materials as required.
C. Remove equipment, materials and debris, leaving area in undamaged and clean condition.
D. Legally dispose of excess materials, trash, debris, etc., off of site.

END OF SECTION 07840
SECTION 07900
JOINT SEALERS

PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Sealants and joint backing.

1.02 RELATED REQUIREMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
   B. Section 07140 - Fluid-Applied Waterproofing: Sealants required in conjunction with substrates for fluid-applied waterproofing.
   C. Section 07840 - Firestopping: Firestopping sealants.
   D. Section 08800 - Glazing: Glazing sealants and accessories.

1.03 REFERENCE STANDARDS

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordinate the work with other sections referencing this section.

1.05 SUBMITTALS
   A. See Section 01300 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data indicating sealant chemical characteristics.
   C. Samples: Submit two samples, 6 by 6 inch in size illustrating sealant colors for selection.
   D. Submit results of field sealant adhesion testing to Architect prior to start of work.
   E. Manufacturer's Installation Instructions: Indicate special procedures.

1.06 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
   B. Applicator Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.

1.07 FIELD CONDITIONS
   A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.08 WARRANTY
   A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
   B. Correct defective work within a five year period after Date of Substantial Completion.
   C. Warranty: Include coverage for installed sealants and accessories which fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.
PART 2 - PRODUCTS

2.01 MANUFACTURERS/PRODUCTS

A. Type 1 - Silicone Sealants:

B. Type 2 - Silicone Sealants:
   4. Substitutions: See Section 01 6000 - Product Requirements.

C. Type 3 - Polyurethane Sealants:

D. Acrylic Sealants (ASTM C920):

E. Butyl Sealants:
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SEALANTS

A. Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.

B. Use silicone sealants at all exterior joints.

C. Type 1 - Silicone Sealant: Ultra low-modulus, high-performance, one-part, moisture-curing silicone joint sealant. ASTM C920, Type S, Grade NS, Class 100/50, Uses NT, A, G, M, O; single component.
   1. Color: To be selected by Architect from manufacturer's standard range.

D. Type 2 - Silicone Sealant: Medium modulus, one-part, high-performance, neutral-cure silicone sealant. ASTM C920, Type S, Grade NS, Class 50, Uses NT, A, G, M, O; single component.
   1. Color: To be selected by Architect from manufacturer's standard range.
   2. Applications: Use for: Metal-to-metal, or Window/louvers-to-masonry joints.

E. Type 3 - Polyurethane Sealant: ASTM C920, Type M, Grade NS, Class 50, Uses NT, I, (Class 2), M, A; multi component, chemical curing, capable of continuous water immersion, non-sagging type.
   1. Color: To be selected by Architect from manufacturer's standard range.
2. Applications: Use for: Concrete block-to-concrete block, or concrete block-to-poured in place concrete in cavity wall construction. Joints and penetrations in vertical and horizontal surfaces of concrete, and between metal and concrete, mortar or stone; overhead or ceiling joints; perimeters of metal frames; vertical expansion and control joints in masonry and concrete; and at all miscellaneous locations requiring a joint sealant.

F. Type 4 - Acoustic Sealant: Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning.
   1. Applications: Use for concealed locations only:
      a. Sealant bead between top stud runner and structure, and between bottom stud track and floor.

2.03 ACCESSORIES
   A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
   B. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
   C. Joint Backing For Exterior Silicone Sealants: Jacketed, bi-cellular polyolefin "soft-rod" backer rods, as manufactured by ITP, Nomaco, or approved equal.
   D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

2.04 MISCELLANEOUS MATERIALS
   A. Primer: Provide type recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated.
   B. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.
   C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surface adjacent to joints.

PART 3 - EXECUTION

3.01 EXAMINATION
   A. Verify that substrate surfaces are ready to receive work.
   B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION
   A. Remove loose materials and foreign matter that could impair adhesion of sealant.
   B. Clean and prime joints in accordance with manufacturer's instructions.
   C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
   D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION
   A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
   B. Perform installation in accordance with ASTM C1193.
C. Install bond breaker where joint backing is not used.
D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
F. Tool joints concave.

3.04 FIELD QUALITY CONTROL
A. Perform field sealant testing for all exterior sealants that affect watertightness.
   1. Test each material scheduled as a substrate for silicone sealants to verify substrate priming and preparation requirements.
   2. Field sealant adhesion testing shall be performed by authorized representative of selected sealant manufacturer.
   3. Submit results of field sealant adhesion testing to Architect prior to start of work.
   4. Coordinate results of testing so that substrate preparation and priming requirements are known at time when needed by sealant applicator before sealant installation.

3.05 CLEANING
A. Clean adjacent soiled surfaces.

3.06 PROTECTION
A. Protect sealants until cured.

END OF SECTION 07900
SECTION 08110
STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Non-fire-rated steel doors and frames.
B. Steel frames for wood doors.
C. Fire-rated steel doors and frames.
D. Steel glazing frames.
E. Accessories, including glazing and louvers.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 08710 - Finish Hardware.
C. Section 08800 - Glazing: Glass for doors and borrowed lites.
D. Section 09900 - Paints and Coatings: Field painting.

1.03 REFERENCE STANDARDS
E. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.
F. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute; 2000 (ANSI/DHI A115 Series).

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any. Show anchorage and accessory items.
D. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.

E. Coordinate glazing frames and stops with glass and glazing requirements.

F. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

G. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Provide doors and frames complying with Steel Door Institute “Recommended Specifications: Standard Steel Doors and Frames” (SDI-100) as herein specified.

C. Provide steel doors and frames from a single manufacturer.

D. Fire-Rated Door Assemblies:
   1. Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies that comply with NFPA 80 “Standard for Fire Doors and Windows,” and have been tested, listed and labeled in accordance with ASTM E 152 “Standard Methods of Fire Tests of Door Assemblies” by a nationally recognized independent testing and inspection agency acceptable to authorities having jurisdiction.
   2. Labels mounted on doors and door frames must indicate the time rating of the door/frame assembly.
   3. Provide units listed and labeled by UL.
   4. Attach fire rating label to each fire-rated unit.
   5. Fire rating label must be accessible, permanent (embossed on metal label), and be kept legible at all times.
   6. Labels on frames with transoms or sidelights must identify that the opening assembly includes same.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in accordance with NAAMM HMMA 840.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

C. Deliver hollow metal work cartoned or crated to provide protection during transit and job storage.

D. Inspect hollow metal work upon delivery for damage. Minor damages may be repaired provided finish items are equivalent in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.

E. Store doors and frames at building site under cover. Place units on minimum 4-inch-high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inch spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Steel Doors and Frames, (General):
3. Mesker Industries, Inc.

B. Substitutions: See Section 01600 - Product Requirements.

2.02 DOORS AND FRAMES

A. Requirements for All Doors and Frames:
   2. Door Edge Profile: Beveled on both edges.
   4. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
   5. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
   6. Galvanizing for Units in Wet Areas: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
   7. Finish: Factory primed, for field finishing.

B. Materials:
   3. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, with ASTM A 525, G60 zinc coating, mill phosphatized.
   5. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.

C. Fabrication:
   1. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at project site.
   2. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).
   3. Fabricate exterior doors, panels and frames from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gauge inverted steel channels.
      a. Use galvanizing repair paint for surfaces damaged by fabrication or welding.
   4. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.
   5. Finish Hardware Preparation:
      a. Prepare doors and frames to receive mortise and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A 115 series specifications for door and frame preparation for hardware.
b. Reinforce doors and frames to receive surface applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site.

c. Locate finish hardware as indicated on final shop drawings, or if not indicated, in accordance with “Recommended Locations for Builders' Hardware,” published by Door and Hardware Institute.

6. Shop Painting:
   a. Clean, treat and paint exposed surfaces of steel door and frame units, including galvanized surfaces.
   b. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before application of paint.
   c. Use galvanizing repair paint for surfaces damaged by fabrication or welding, prior to prime coat.
   d. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.
   e. Do not paint fire labels on doors or frames.

D. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 STEEL DOORS

A. Exterior Doors:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
   2. Core: Polystyrene foam.
   3. Top Closures: Flush with top of faces and edges.

B. Interior Doors, Non-Fire-Rated:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
   2. Core: Polystyrene foam.

C. Interior Doors, Fire-Rated:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
   2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C ("positive pressure").
      a. Provide units listed and labeled by UL.
      b. Attach fire rating label to each fire rated unit.
   3. Core: Mineral fiberboard.

2.04 STEEL FRAMES

A. General:
   1. Comply with the requirements of grade specified for corresponding door, except:
      a. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricated frames of minimum 16-gauge cold-rolled furniture steel.
1) Frames for doors 7'-10" or more in height and/or over 3'-5" in width: 14 gauge cold-rolled furniture steel, and one additional hinge, whether or not indicated in hardware schedule.

2. Finish: Factory primed, for field finishing.

3. Frames shall be formed by press brake with corners sharp and true. Corners shall be mitered and accurately fitted, and shall be fully electrically welded and then ground smooth. Removable spreaders shall be welded to the bottom of the frame. Frames shall be accurately mortised for hardware.

4. A minimum of three wall anchors shall be provided at each jamb, except four at doors 7'-10" high or more, and six at doors 10-foot high or more. Anchors shall be attached to door frames, adjustable, suitable for wall conditions and job requirements, and shall be 16 gauge minimum. Floor anchors shall be provided and welded to foot of each jamb with two 5/16" holes for securing to the floor.

5. Reinforcements of adequate gauge shall be provided for strikes, closers and brackets and other surface applied hardware for field drilling and tapping.

6. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.

7. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

8. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.


B. Exterior Door Frames: Fully welded.

1. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.

2. Weatherstripping: Integral, recessed into door edge or frame.

C. Interior Door Frames: Fully welded type.

D. Interior Door Frames, Fire-Rated: Fully welded type.

1. Fire Rating: Same as door, labeled.

E. Frames for Interior Glazing or Borrowed Lights: Construction and face dimensions to match door frames, and as indicated on drawings.

2.05 ACCESSORY MATERIALS

A. Glazing: As specified in Section 08 8000 - Glazing.

B. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.

C. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

1. Provide additional door silencers at doors over 3'-0" wide or 7'-0" in height.

2. Provide silencers equivalent to "GJ64" silencers as manufactured by Glenn-Johnson Corp., for metal frames, when not provided under the work of Section 08710 - "Finish Hardware."

D. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.06 FINISH MATERIALS

A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.
B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 - EXECUTION

3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.

3.02 PREPARATION
A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION
A. General: Install standard steel doors, frames and accessories in accordance with final shop drawings and manufacturer's data, and as herein specified.
B. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.
C. In addition, install fire rated units in accordance with NFPA 80.
D. Coordinate frame anchor placement with wall construction.
E. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
F. Placing Frames:
   1. Comply with provisions of SDI-1-06 “Recommended Erection Instructions for Steel Frames,” unless otherwise indicated.
   2. Remove before installation all spreader bars and braces used for shipping.
   3. Except for frames located at in-place concrete or masonry, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces leaving surfaces smooth and undamaged.
   4. In masonry construction, locate a minimum of 3 wall anchors per jamb at hinge and strike levels. Add 1 wall anchor per jamb at hinge and strike levels for each whole 1'-10" height increment over 6'-0"; Similar at glazed and cased openings.
   5. At in-place concrete or masonry construction, set frames and secure to adjacent construction with machine screws and masonry anchorage devices.
   6. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. Attach wall anchors to studs with tapping screws. Add additional anchors as indicated in paragraphs above.
   7. Install fire-rated frames in accordance with NFPA Std. No. 80
G. Door Installation:
   1. Fit hollow metal doors accurately in frames, within clearances specified in SDI-100.
   2. Place fire-rated doors with clearances as specified in NFPA Std. No. 80.
H. Install silencers after all painting of doors and frames has been completed
I. Coordinate installation of hardware.
J. Coordinate installation of glazing.
K. Coordinate installation of electrical connections to electrical hardware items.
3.04 TOLERANCES
   A. Clearances Between Door and Frame: As specified in ANSI A250.8.
   B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.05 ADJUSTING
   A. Adjust for smooth and balanced door movement.
   B. Prime Coat Touch-up:
      1. Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply
         touch-up of compatible air-drying primer.
      2. Use galvanizing repair paint for galvanized surfaces, prior to prime coat.
   C. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and
      frames undamaged and in complete and proper operating condition.

3.06 SCHEDULE
   A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 08110
SECTION 08211
FLUSH WOOD DOORS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Flush wood doors; flush configuration; fire rated and non-rated.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 06200 - Finish Carpentry.
C. Section 08110 - Steel Doors and Frames.
D. Section 08710 - Door Hardware.
E. Section 08800 - Glazing.

1.03 REFERENCE STANDARDS
A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements for submittal procedures.
B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
C. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing and louvers.
D. Samples: Submit two samples of stain colors, 6 x 6 inches minimum - on actual veneer chosen, for Architect to use to select stain color.
E. Verification Samples: Submit two samples of door veneer, minimum 24 x 24 inches in size illustrating wood grain, stain color, and sheen.
F. Manufacturer's Installation Instructions: Indicate special installation instructions.
G. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
B. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated.
1.06 DELIVERY, STORAGE, AND HANDLING
   A. Package, deliver and store doors in accordance with specified quality standard.
   B. Accept doors on site in manufacturer’s packaging. Inspect for damage.
   C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY
   A. See Section 01780 - Closeout Submittals for additional warranty requirements.
   B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
   C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 - PRODUCTS

2.01 MANUFACTURERS
   A. Wood Veneer Faced Doors:
      5. Substitutions: See Section 01600 - Product Requirements.

2.02 DOORS
   A. All Doors: See drawings for locations and additional requirements.
      1. Quality Level: Premium Grade, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
      2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
   B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
      1. Provide solid core doors at all locations.
      2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with NFPA 252, UL 10B, or UBC Standard 7-2-94 ("neutral pressure"); UL or WH (ITS) labeled without any visible seals when door is open.
         a. Labeling of Fire Doors:
            1) Attach fire rating label to each fire rated unit.
            2) Fire rating label must be accessible, permanent (embossed on metal label), kept legible at all times, and shall contain the fire resistance rating in hours and/or minutes.
      3. Wood veneer facing with factory transparent finish.

2.03 DOOR AND PANEL CORES
   A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated above.
   B. Fire Rated Doors if shown: Mineral core, Type FD, plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
2.04 DOOR FACINGS
   A. Wood Veneer Facing for Transparent Finish: Plain sliced Select White birch, veneer grade as specified above for Door Quality Level, book veneer match, center balance assembly match; unless otherwise indicated.
      1. Vertical Edges: Any option allowed by quality standard for grade.

2.05 ACCESSORIES
   A. Metal Louvers:
      1. Material and Finish: Roll formed steel; pre-painted finish to color as selected, 18 gauge minimum.
      2. Louver Blade: Inverted V blade, sight proof, light proof.
      3. Louver Free Area: 50 percent minimum.
   B. Glazing Stops: Wood, of same species as door facing, mitered corners; prepared for countersink style tamper proof screws.

2.06 DOOR CONSTRUCTION
   A. Fabricate doors in accordance with door quality standard specified.
   B. Cores Constructed with stiles and rails:
      1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
   C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
   D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   E. Provide edge clearances in accordance with the quality standard specified.

2.07 FACTORY FINISHING - WOOD VENEER DOORS
   A. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 5 - Finishing for Grade specified and as follows:
   B. Factory finish doors in accordance with specified quality standard:
      1. Transparent Finish: Transparent catalyzed polyurethane, Premium quality, minimal sheen.
      2. Stain color shall be selected by Architect from manufacturer's full range.

PART 3 - EXECUTION
3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify that opening sizes and tolerances are acceptable.
   C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION
   A. Install doors in accordance with manufacturer's instructions and specified quality standard.
      1. Install fire-rated doors in accordance with NFPA 80 requirements.
   B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
   C. Use machine tools to cut or drill for hardware.
D. Coordinate installation of doors with installation of frames and hardware.
E. Coordinate installation of glazing.
F. Install door louvers plumb and level.

3.03 TOLERANCES
   A. Conform to specified quality standard for fit and clearance tolerances.
   B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING
   A. Adjust doors for smooth and balanced door movement.
   B. Adjust closers for full closure.

3.05 SCHEDULE - SEE DRAWINGS

END OF SECTION 08211
SECTION 08310
ACCESS DOORS AND PANELS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Wall access door and frame units.
B. Access door and frame units, fire-rated and non-fire-rated, in wall and ceiling locations.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 04810-Unit Masonry Assemblies: Openings in masonry.
C. Section 06100-Rough Carpentry: Openings in partitions.
D. Section 07900 - Joint Sealers.
E. Section 09260 - Gypsum Board Assemblies: Openings in gypsum ceilings or partitions.
F. Section 09900 - Paints and Coatings: Field paint finish.
G. Divisions 15 and 16 Sections: Additional access doors provided and installed by Contractors for Plumbing, Mechanical, Electrical and related work.

1.03 SUMMARY
A. This Section includes access doors for installation in the following types of new construction:
   1. Gypsum drywall.
   2. Unit masonry.
   3. As otherwise indicated.
B. Provide fire-rated access doors where indicated or scheduled, and at access openings in all walls of stairs, elevator shafts and equipment rooms, other shafts and plumbing chase walls which are partially or fully open through floors, and at walls and ceilings indicated or required by Code to be fire-rated.

1.04 REFERENCE STANDARDS

1.05 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
   1. Include complete schedule, including types, general locations, sizes, wall and ceiling construction details, finishes, latching or locking provisions, and other data pertinent to installation.
C. Shop Drawings: Indicate exact position of all access door units. Also indicate fabrication and installation of customized access doors and frames, including details of each frame type, elevations of door design types, anchorage and accessory items.
D. Manufacturer's Installation Instructions: Indicate installation requirements.
E. Project Record Documents: Record actual locations of all access units.

1.06 REGULATORY REQUIREMENTS
A. Conform to applicable code for fire rated access doors.
1. Provide access doors of fire rating equivalent to the fire rated assembly in which they are to be installed.
2. Provide products listed and labeled by UL as suitable for the purpose specified and indicated.

B. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in Underwriters Laboratories, Inc.’s “Building Materials Directory” for rating shown.
   1. Provide UL label on each fire-rated access door.
   2. Fire rating label must be accessible, permanent (embossed on metal label), kept legible at all times, and shall contain the fire resistance rating in hours and/or minutes.

1.07 QUALITY ASSURANCE

A. Single-Source Responsibility: Obtain access doors for entire project from one source from a single manufacturer.
B. Size Variations: Obtain Architect’s acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.
C. Coordination: Furnish inserts and anchoring devices that must be built into other work for installation of access doors. Coordinate delivery with other work to avoid delay.

1.08 PROJECT CONDITIONS

A. Coordinate the work with other work requiring access doors.
B. Verification: Obtain specific locations and sizes for required access doors from trades requiring access to concealed equipment, and indicate on submittal schedule.
C. Special-Size Access Doors: Use where required or requested; indicate on schedule.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Wall and Ceiling Access Doors:
   2. Bar-Co., Inc.
   3. Cesco Products
   4. J.L. Industries
   8. The Williams Brothers Corp.
   9. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ACCESS DOORS AND PANELS

A. All Units: Factory fabricated, fully assembled units with corner joints welded, filled, and ground flush; square and without rack or warp; coordinate requirements with assemblies units are to be installed in.
B. Units in Fire Rated Assemblies: Fire rating equivalent to the fire rated assembly in which they are to be installed.

2.03 MATERIALS AND FABRICATION: ACCESS DOOR UNITS - WALLS AND CEILINGS

A. Door and Frame Units: Formed steel.
1. General: Furnish each access door assembly manufactured as an integral unit, complete with all parts, and ready for installation.

2. Steel Access Doors and Frames: Fabricate units of continuous welded steel construction, unless otherwise indicated. Grind welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of support shown.

3. Frames and flanges: 0.058 inch steel.
   a. Fabricate frame with exposed flange, nominal 1-inch wide around perimeter of frame for units installed in the following construction:
      1) Exposed masonry.
      2) Exposed concrete.
      3) Exposed siding.
   b. For gypsum drywall or gypsum veneer plaster, furnish perforated flange frames with drywall bead.
   c. For full-bed plaster and E.I.F.S. applications, furnish frames with galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.

4. Door panels: 0.070-inch single thickness steel sheet.
   a. Painted Flush Panel Doors (non-fire-rated and fire-rated): Fabricate from not less than 16-gage galvanized sheet steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees. Finish with manufacturer's factory-applied prime paint.
      1) Restore any damage to galvanized finish with cold-process galvanizing repair paint, prior to applying factory prime coating, or other finishes.
   b. Stainless Steel Flush Panel Doors: Fabricate from not less than 18-gage stainless steel sheet, with concealed spring hinges or concealed piano hinge set to open 175 degrees. Buff exposed surfaces to #4 satin finish, except where other finishes are indicated.

5. Size: As indicated or as necessary to access and service equipment.

6. Hardware:
   a. Hardware for Fire Rated Units: As required for listing.
   b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
   c. Hinge: 175 degree steel piano hinge with removable pin.
   d. Latch/Lock: Screw driver slot for quarter turn cam latch.

7. Galvanized, hot dipped finish, except where indicated otherwise.

8. Finish: No. 4 finish for stainless units.

B. Non-Fire Rated Door and Frame Units in Walls:
   1. Provide manufacturer's standard flush panel/door and frame.

C. Fire Rated Door and Frame Units in Walls:
   1. For fire rated units, provide manufacturer's standard insulated flush panel/doors, with continuous piano hinge and self-closing mechanism.

D. Locking Devices: Furnish flush, screwdriver-operated cam locks of number required to hold door in flush, smooth plane when closed.

E. Finishes:
   1. Exterior: 3-coat 70% resin “Kynar 500” finish (i.e.: 7-mil prime coat, 9-mil color coat, and 9-mil clear top coat) with minimum 2.4 mil total dry film thickness, in color to match adjacent finish where occurs, unless otherwise selected by Architect from manufacturer's standard non-metallic colors - 15 colors minimum to select from, including white.
   2. Interior, Exposed to Normal View: To match finish on interior. Door "Finish Hardware" (refer to Section 08710), or if not indicated, to match existing hardware in room where occurs.
3. Interior, in Service Areas, Above Ceilings, etc: Factory primed baked enamel.
4. Toilet Rooms, Janitors Rooms, Kitchens, Kitchen Areas, Rooms Where Food is Stored, Prepared, Cooked and/or Served, and Break Rooms: Stainless steel, No. 4, satin finish.

2.04 FABRICATION
   A. Weld, fill, and grind joints to ensure flush and square unit.

PART 3 - EXECUTION

3.01 EXAMINATION
   A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION
   A. Install units in accordance with manufacturer's instructions.
   B. Install frames plumb and level in openings in relation to adjacent finish surfaces. Secure rigidly in place.
   C. Position units to provide convenient access to the concealed work requiring access.
   D. Coordinate installation with work of other trades.
   E. Prepare perimeter of rough openings in concrete, CMU, and clay masonry with mortar/grout full-depth of wall and to size required; use pressure-treated wood as necessary for other concealed blocking, grounds, and supports at any stud wall construction.

3.03 ADJUST AND CLEAN
   A. Adjust hardware and panels after installation for proper operation.
   B. Remove and replace panels or frames that are warped, bowed, or otherwise damaged.

END OF SECTION 08310
SECTION 08410
METAL-FRAMED STOREFRONTS

PART 1 - GENERAL
1.01 SECTION INCLUDES
   A. Aluminum-framed storefront, with vision glass.
   B. Infill panels of glass.
   C. Aluminum doors and frames.
   D. Weatherstripping.
   E. Perimeter sealant.

1.02 RELATED REQUIREMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
   B. Section 05500 - Metal Fabrications: Steel attachment devices.
   C. Section 07840 - Firestopping: Firestop at system junction with structure.
   D. Section 07900 - Joint Sealers: Perimeter sealant and back-up materials.
   E. Section 08710 - Finish Hardware: Door Hardware for aluminum entrances.
   F. Section 08800 - Glazing: Glass, and glazing accessories.

1.03 REFERENCE STANDARDS
   A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2012.
   B. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; American Architectural Manufacturers Association; 2009 (part of AAMA 501).

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordinate with installation of other components that comprise the exterior enclosure.
   B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS
   A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Design Data: Provide framing member structural and physical characteristics, engineering calculations, dimensional limitations.

E. Samples: Submit two samples 12 by 12 inches in size illustrating finished aluminum surface, glass, glazing materials.

F. Submit all storefront materials and accessory products to glazing manufacturer to verify materials compatibility with glazing.

G. Report of field testing for water leakage.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum five years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. See Section 01780 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

D. Warranty shall include language relating to watertightness and air tightness.

E. Provide twenty year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers:
8. Substitutions: See Section 01600 - Product Requirements.

2.02 STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Glazing Rabbet: For 1 inch insulating glazing for exterior applications.
   2. Glazing Position:
      a. Exterior: Outside glazed, center plane

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   2. Cross-Section: As indicated on drawings.

B. Swing Doors: Glazed aluminum.
   2. Top Rail: 5 inches wide.
   4. Bottom Rail: 10 inches wide, minimum.
   5. Glazing: Double glazed.
   7. Finish: Same as storefront.

2.04 PERFORMANCE REQUIREMENTS

A. Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
   1. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

B. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

C. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at specified differential pressure across assembly in accordance with ASTM E 283.

D. Water Leakage: None, when measured in accordance with ASTM E 331 at specified pressure differential.

E. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

F. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

2.05 MATERIALS

B. Fasteners: Stainless steel.
C. Perimeter Sealant: Type specified in Section 07900.
D. Glass: As specified in Section 08800.
E. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
F. Glazing Accessories: As specified in Section 08800.

2.06 FINISHES
A. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
B. Color:
   1. Exterior: To be selected by Architect from manufacturer's full range.
   2. Interior: To be selected by Architect from manufacturer's full range.

2.07 HARDWARE
A. For each door, include weatherstripping.
B. Balance of Door Hardware: As specified in Section 08710.
C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.

2.08 FABRICATION
A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
C. Prepare components to receive anchor devices. Fabricate anchors.
D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
E. Arrange fasteners and attachments to conceal from view.
F. Reinforce components internally for door hardware.
G. Increase gauge or reinforce framing members as required for imposed loads and span conditions.
H. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
   1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verify dimensions, tolerances, and method of attachment with other work.
B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION
A. Install wall system in accordance with manufacturer's instructions.
B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
C. Provide alignment attachments and shims to permanently fasten system to building structure.
D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
E. Provide thermal isolation where components penetrate or disrupt building insulation.
F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
H. Coordinate attachment and seal of perimeter air and vapor barrier materials.
I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
J. Install hardware using templates provided.
K. Install glass in accordance with Section 08800, using glazing method required to achieve performance criteria.
L. Install perimeter sealant in accordance with Section 07900.
M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES
A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL
A. See Section 01400 - Quality Requirements, for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.
B. Test installed storefront for water leakage in accordance with AAMA 501.2.
   1. Extent: 50% of installed storefront units. If a storefront unit fails water testing, then the unit shall be repaired and re-tested at contractor's expense. For every unit storefront unit that fails AAMA 501.2 testing, an additional unit shall be added to testing schedule.
C. Test installed storefront additionally in accordance with ASTM E1105-00 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference. Testing shall include elements of storefront system, and air and watertight transitions between storefront and water/air barrier coating behind adjacent veneer/claddings.
   1. Perform this testing after installation of water/air barrier coating on sheathing behind veneer/claddings, but before veneer/claddings are installed.
   2. Static pressure differential testing shall be performed at not less than 2/3 of the pressure differential scheduled for ASTM E331 testing.

3.05 ADJUSTING
A. Adjust operating hardware for smooth operation.

3.06 CLEANING
A. Remove protective material from pre-finished aluminum surfaces.
B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
C. Remove excess sealant by method acceptable to sealant manufacturer.

3.07 PROTECTION

A. Protect installed products from damage during subsequent construction.

END OF SECTION 08410
SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.01 WORK INCLUDED:

A. The work in this section shall include the furnishing of all items of finish hardware as hereinafter specified, or obviously necessary to complete the building, except those items which are specifically excluded from this section of the specification.

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

1.01 RELATED WORK:

A. The following section of this specification should be examined in order to identify materials or equipment which may be obtained through this Section.

   Section 08110 - “Steel Doors and Frames”
   Section 08125 – “Aluminum Doors and Framers”
   Section 08211 – “Wood Doors”

In addition to the above referenced sections, security and access control specifications include as scope of work items of electrical security hardware being provided as an integral part of the access control system. Hardware schedules submitted for approval by the Section 08700 Finish Hardware supplier should reference these items by description, manufacturer, and model number in their HW sets to insure that the suppliers of doors and frames are fully aware of the critical need of preparing doors and frames to receive these electrical hardware items.

1.02 DESCRIPTION OF WORK:

A. Finish Hardware: Hardware used in building construction but particularly that used on or in connection with doors, frames, cabinets and other movable members. It also has a finished appearance as well as functional purpose and may be considered as a part of the decorative treatment of a room or building.

1.03 QUALITY ASSURANCE:

A. Hardware has been specified herein by manufacturers’ name, brand and catalog numbers for the purpose of establishing a basis for quality, finish, design and operational function. No other products will be furnished unless approved by means of 1.4 Paragraph “D”.

B. To insure a uniform basis of acceptable materials, it is the intention that only manufacturers’ item specified as “acceptable and approved” be furnished for use on this project.
C. Deviation from or modification of items will be permitted only for special instances caused by reason of construction characteristics and for the purpose of providing proper operational function. The contractor shall be responsible for checking any necessary deviations in order that hardware shall fit and function properly.

D. Substitutions: Request for substitutions of items of hardware other than those listed as “acceptable and approved” shall be made to the architect in writing no later than fourteen (14) days prior to bid opening. Approval of substitutions will only be given in writing or by Addenda. Requests for substitutions shall be accompanied by samples and/or detailed information for each manufacturer of each product showing design, functions, material thickness and any other pertinent information needed to compare your product with that specified. Lack of this information will result in a refusal.

E. Supplier: A recognized builders hardware supplier whose principal office and place of business is located within 150 miles of the project site, who has been furnishing hardware in the project’s vicinity for a period of not less than five (5) years; and who is, or has in full time employment an Architectural Hardware Consultant (AHC) in good standing as certified by the American Society of Architectural Hardware Consultants, or equivalent, and who is a direct distributor of the products approved, for warranty purposes. This paragraph will be strictly enforced. All schedules shall be signed and sealed by an AHC.

The supplier must have demonstrated willingness to coordinate field problems, and (upon reasonable compensation) to assist the Owner in re-keying and service operations. He must have a reputation for supplying quality material.

F. Products and installation under the work of this Section shall be in compliance with applicable provisions of published U. S. Justice Department Regulations for the “Americans with Disabilities Act of 1990” (ADA; ADA-AG); ANSI A117.1; and the “Uniform Federal Accessibility Standards” (UFAS), 1988 Edition; And revisions and amendments thereto.

1. Where this requires any substitution of products specified herein, advise Architect in writing for necessary approvals.

1.04 SUBMITTALS:

A. The finish hardware supplier shall, after award of a formal contract submit to the architect, six (6) complete computerized or typewritten (handwritten are not acceptable) copies of the proposed finish hardware schedule for approval. The schedule shall be prepared using the “sequence and format” for the Door and Hardware Institute (DHI). After approval of the schedule the hardware supplier shall provide three (3) copies of this approved schedule to the contractor for file and distribution purposes. Hardware will not be ordered by the hardware supplier until an approved schedule has been received. Horizontal schedules will not be acceptable. Provide vertical format.

Items of security hardware being provided by the security and access control system supplier are to be listed in the HW Schedule prepared by the Section 08700 Finish Hardware supplier. These security hardware items being provided by the security and access control supplier are to be noted as “By Security” and are being noted to insure that doors and frames are correctly prepared to receive these items of electrical security hardware.
B. When submitting schedules for approval, include two manufacturers’ cut sheets on each hardware item proposed. Index it with the use of number or letters or a combination of both, with the hardware schedule. The index numbers/letters are to be in right hand column on the same line as the respective manufacturers’ numbers. All manufacturers’ numbers shall be indexed even when appearing more than once.

C. Templates: The hardware supplier shall provide necessary templates and/or physical hardware to all trades requiring them in order that they may cut, reinforce or otherwise prepare their material or product to receive the hardware item. If physical hardware is required by any manufacturer the hardware supplier shall ship to them such hardware via prepaid freight in sufficient time to prevent any delay in the execution of their work.

D. Furnish complete wiring diagrams, riser diagrams, elevation drawings and operational descriptions of electrical components and systems, listed by opening in the hardware submittals. Elevation drawings shall identify locations of the system components with respect to their placement in the door opening. Operational descriptions shall fully detail how each electrical component will function within the opening, including all conditions of ingress and egress. Provide a copy with each hardware schedule submitted for approval. Supply a copy with delivery of hardware to the jobsite and another copy to the Owner at the time of project completion.

E. Submittal Sequence: Submit final schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work that is critical in the Project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of schedule.

F. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

G. Contract closeout submittals:
   1. Operation and maintenance data: Complete information for installed door hardware.
   2. Warranty: Completed and executed warranty forms.

1.05 DELIVERY, STORAGE, AND HANDLING:

A. All items of hardware to be delivered to the job site shall be of completely packaged with all necessary screws, bolts, miscellaneous parts, instructions and where necessary installation templates for manufacturers’ suggested installation. All boxes are to have a typed label with door hand, room location, item number and keying to conveniently identify them and their intended location in the building.

B. A representative of the general contractor shall receive the hardware when delivered at the job site. A dry locked storage space complete with shelving, shall be set aside for the purpose of unpacking, sorting, checking and storage.

C. Finish hardware shall be delivered to the general contractor by the hardware supplier. Direct factory shipments to the job site are not acceptable.
D. The hardware shall be jointly inventoried by the representative of the general contractor and the hardware supplier.

E. Items damaged in shipment shall be replaced promptly and with proper material without additional cost to the general contractor.

F. All hardware shall be handled in a manner to minimize marring, scratching or damage.

1.06 WARRANTY:

A. All hardware, with the exception of those items listed in Par. 1.7.B, shall have a one year limited warranty.

B. Special warranties:
   1. Door Closers: Ten year period
   2. Locks and Key Cylinders: Ten year period
   3. Exit Devices: Ten year period

1.07 MAINTENANCE:

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

B. Parts kits: Furnish manufacturers' standard parts kits for locksets, exit devices, and door closers.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware are indicated in the hardware schedule at the end of this Section.

2.02 FINISH OF HARDWARE:

A. Finish of hardware items shall conform to ANSI A156.18 unless otherwise specified in the hardware sets, and shall be as follows:
   1. Continuous Hinges  628
   2. Locksets  630
   3. Exit Devices  626
   4. Closers  689
   5. Kick, mop, armor plates  630
   6. Miscellaneous Items  630 or 626
   7. Thresholds and Weather-strip  Clear Anodized Aluminum
   8. Overhead Holders  689

2.03 HINGES AND CONTINUOUS HINGES:
A. Continuous gear hinges to be manufactured of extruded 6063-T5 aluminum alloy with clear anodized finish.

B. All hinges are to be manufactured t template. Uncut hinges shall be non-handed and shall be a pinless assembly of three interlocking extrusions applied to the full height of the door and frame without reinforcing.

C. Vertical door loads shall be carried on chemically lubricated polyacetal thrust bearings. The door and frame leaves shall be continually geared together for the entire hinge length and secured with a full cover channel. Hinge to operate to a full 180 degree swing.

D. Hinges to be milled, anodized and assembled in matching pairs. Fasteners supplied shall be 410 stainless steel, plated and hardened.

E. Provide UL listed continuous hinges at fire doors. Continuous hinges at fire doors shall meet the required UL ratings without the use of auxiliary fused pins or studs.

F. Acceptable and approved only as follows:
   1. Hager
   2. Ives*
   3. Bommer
   4. Select

G. Substitutions allowed only as described under paragraph 1.4.D of this section.

2.04 KEYS AND KEYING:

A. New Standard System – Except as otherwise indicated, provide new (Schlage Everest 29T) master key system for project featuring patented, restricted keys and auxiliary locking pin. Patented key and cylinder design to be valid until 2029. All cores are to be of 7-pin design, and shall be instantly interchangeable without adaptation or modification, into the housing of all locks. Provide temporary brass construction cores for ALL locksets during the construction phase of the project.

B. All locks and cylinders are to be constructed so that a full size interchangeable core is used. The control key is to have the same number of cuts as the master keys and is not to vary in size in any way, other than the depth of the cuts, from the size of the grandmaster, master, sub-master and operating keys.

C. All cores and keys shall be marked to correspond with the schematic key plan as determined during a meeting between the owner and lock manufacturer’s representative. The schematic will describe the proposed grandmaster key plan, and will include future expansion capabilities.

D. All keys and key blanks shall be stamped "DO NOT DUPLICATE". All cores shall be stamped with key set symbol in a concealed location. All keys shall be stamped with key set symbols.

E. All keys shall be of nickel silver material.
F. This master key system shall utilize only one keyway and shall have provisions for future expansion under the grandmaster key. There shall be no deep cuts next to the shanks for any master key level keys.

G. All lock cylinders, cylinder parts, keys and related service equipment must be supplied by a single manufacturer.

H. Furnish keys in the following quantities:
   1. 5 each Master keys per set created
   2. 3 each Change keys each keyed cylinder
   3. 10 each Construction MK
   4. 4 each control keys

2.05 LOCKSETS & LATCHSETS:

A. Accepted and approved as follows:
   1. Corbin Russwin
   2. Schlage
   3. Falcon T Series Interior Doors

2.06 CLOSERS AND AUTOMATIC DOOR OPERATORS:

A. Accepted and approved only as follows:
   1. LCN* 4011 / 4111
   2. Sargent 281
   3. Falcon SC70 Series
B. All closers shall be mounted on interior side of rooms.

C. All closers shall have full covers. Closers shall have forged steel arms equal to the above specifies units. Closers shall be capable of adjustment as required to meet all ADA opening force requirements.

2.07 EXIT DEVICES

A. Accepted and approved only as follows:
   1. Von Duprin 99 Series
   2. Precision
   3. Falcon 25 Series

2.08 FLAT GOODS, PUSH PULLS, AND MISCELLANEOUS DOOR TRIM:

A. Accepted and approved only as follows:
   1. Ives*
   2. Rockwood
   3. Trimco
   4. Balswin
B. It is the responsibility of the hardware supplier to provide proper screw attachments per wall or floor conditions for door stops.

C. Provide stops for each and every interior and exterior opening.

D. Kick plates and armor plates shall be .050” Stainless Steel.

E. Substitutions allowed only as described under paragraph 1.4.D of this Section.

2.09 OVERHEAD HOLDER/STOPS:

A. Accepted and approved only as follows:
   1. Glynn Johnson* 90 and 450 Series

B. Substitutions allowed only as described under paragraph 1.4.D of this section.

2.10 THRESHOLDS AND WEATHERSTRIPPING:

A. Accepted and approved as follows:
   1. Reese
   2. National Guard*
   3. Zero

C. Substitutions allowed only as described under paragraph 1.4.D of this section.

PART 3 – EXECUTION

3.01 INSTALLATION:

A. Mount hardware units at heights indicated in “recommended locations for builders hardware” for (standard steel doors and frames), (custom steel doors and frames), (wood doors and frames) by the Door and Hardware Institute (DHI), except if otherwise specifically indicated or to comply with requirements of governing regulations, requirements for the disabled or handicapped, or if otherwise directed by the Architect.

B. Degree of opening for doors with overhead holders, closers, etc., shall be included in the hardware schedule for the Architect’s approval.

C. All hardware shall be installed by tradesmen skilled in the application of commercial grade hardware.

D. Install each hardware item in compliance with the instructions and recommendations. Securely fasten
all parts to be attached. Fit faces of mortised parts snug and flush. Make sure all operating parts move freely and smoothly without binding, sticking or excessive clearance. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted and finished in another way, the hardware shall be removed and stored prior to the painting or finishing. Items shall then be reinstalled only when the finishes have been completed on the surface to which the hardware is to be applied.

E. After installation, representative templates, instruction sheets and installation details shall be placed in a file folder to be turned over to the owner when the building is accepted. Included shall be at least five each of any special adjusting and/or installation tools furnished with the hardware by the manufacturers.

3.02 ADJUSTING AND CLEANING:

A. Adjust and check each operating item of hardware to ensure correct operation and function. Units which cannot be adjusted to operate as intended for the application made shall be replaced.

B. Final Adjustment: Wherever hardware installation is made more than one month prior to building acceptance or occupancy of a space or area. The installer shall return to the work during the week prior to acceptance or occupancy and make final check and adjustment of all hardware items. Hardware shall be cleaned as necessary to restore current operation, function and finish. Door control devices shall be adjusted to compensate for final operation of heating and ventilating equipment.

3.03 PROTECTION:

A. Whenever hardware is located in areas where it may be subject to damage during construction by handling, cleaning, etc., (e.g., painting, cleaning of bricks) it shall be protected and/or removed from its location until the hazardous condition is terminated.

3.04 GENERAL NOTES:

A. Before installation of any hardware begins the contractor’s installer shall contact the hardware supplier to discuss any special installation requirements for all hardware items. Their discussion shall include, but not be limited to such items as proper closer mounting, proper fasteners to be used for hardware, locksets and exit device backsets, etc.

B. Electric power tools should be used on hardware fasteners so as to prevent damage to screw heads.

C. Hardware supplier should verify all quantities in the following schedule.
3.05 SCHEDULES:

A. The following is a general listing of hardware requirements and is not intended for use as a final hardware schedule. Any items of hardware required by established standards of practice, or to meet state and local codes shall be furnished whether or not specifically called out in the following listed groups.

B. Supplier shall supply hardware for every numbered opening, whether specified in the above hardware sets or not. Hardware shall be same as similar openings.

C. It is intended that hardware for aluminum doors shall be supplied under this section. Hardware supplier shall coordinate this requirement with aluminum door and frame supplier.

HW SET: 1.01

DOOR NUMBER:
109A 125A

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HW SET: 5.02

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COAT HOOK AT OFFICE SPACES ONLY
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**Coat Hook at Office Spaces Only**
HW SET: 7.01

DOOR NUMBER:
118  118A  123

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1  STOREROOM LOCK  T581J  FAL
1  FSIC CORE  23-030  SCH
1  SURFACE CLOSER  SC71 REG  FAL
1  KICK PLATE  8400  IVE
1  FLOOR STOP  FS410  IVE
1  SEALS  5020B  NGP

HW SET: 7.02

DOOR NUMBER:
115  120A  121  125  118B

EACH TO HAVE:
3  HW HINGE  5BB1HW 4.5 X 4.5 NRP  IVE
1  STOREROOM LOCK  T581J  FAL
1  FSIC CORE  23-030  SCH
1  SURFACE CLOSER  SC71 DS  FAL
1  KICK PLATE  8400  IVE
1  SEALS  5020B  NGP
HW SET: A1.01

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SUPPLIER TO FIELD VERIFY EXISTING DOOR, FRAME AND HARDWARE AND COORDINATE NEW HARDWARE AS REQUIRED.
SUPPLIER TO FIELD VERIFY EXISTING HINGES AND COORDINATE NEW HINGES AS REQUIRED MATCHING EXISTING SIZE AND WEIGHT.
HW SET: A1.02

DOOR NUMBER: 104

EACH TO HAVE:

2 PANIC HARDWARE 25-C-E0 FAL
2 CONCEALED CLOSER 2031 LCN
2 FLOOR STOP FS18S IVE
1 SEAL BY ALUM DOOR MFR
1 ASTRAGAL BY ALUM DOOR MFR
2 DOOR BOTTOM BY ALUM DOOR MFR
1 THRESHOLD 613 NGP

SUPPLIER TO FIELD VERIFY EXISTING DOOR, FRAME AND HARDWARE AND COORDINATE NEW HARDWARE AS REQUIRED.
SUPPLIER TO FIELD VERIFY EXISTING HINGES AND COORDINATE NEW HINGES AS REQUIRED MATCHING EXISTING SIZE AND WEIGHT.
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END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES
   A. Glass and plastic glazing.
   B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
   B. Section 08110 - Steel Doors and Frames: Glazed doors and borrowed lites.
   C. Section 08211 - Flush Wood Doors
   D. Section 08410 - Aluminum Entrances and Storefronts: Frames for glazing specified in this Section.
   E. Section 10800 - Toilet, Bath, and Laundry Accessories: Framed Mirrors.

1.03 REFERENCE STANDARDS
   G. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2009.
   H. GANA (SM) - GANA Sealant Manual; Glass Association of North America; 2008.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS
   A. See Section 01300 - Administrative Requirements, for submittal procedures.
   B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
   C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
   D. Samples: Submit two samples 6x6 inch in size of glass units, showing coloration and design, for selection purposes.
   E. Samples: Submit two samples 12x12 inches in size of selected glass units for verification purposes.
   F. Certificates: Certify that products meet or exceed specified requirements.
1.06 QUALITY ASSURANCE
A. Labeling: Furnish each pane of fire resistance-rated glazing and each pane of safety glazing with a permanent identification which meets the requirements of the latest approved edition of the International Building Code.
B. Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual", and SIGMA TM-3000, "Vertical Glazing Guidelines", except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this sector or other referenced standards.
C. Safety Glazing Standard: Where safety glass is indicated or required by authorities having jurisdiction, provide type of products indicated which comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials.
D. Fire Resistance Rated Glass: Provide glass products that meet CPSC 16 CFR 1201, Category I or II requirements for fire-rated and impact-resistant glass and are labeled and listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
E. Insulating Glass Certification Program: Provide insulating glass units permanently marked either on spacers or at least one component pane of units with appropriate certification label of the inspecting and testing organization indicated below.
   1. Insulating Glass Certification Council (IGCC).
      a. Certification: CBA.
G. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

1.07 FIELD CONDITIONS
A. Do not install glazing when ambient temperature is less than 50 degrees F.
B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY
A. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.
B. Polycarbonate Sheet Glazing: Provide a fifteen (15) year warranty to include coverage for breakage, coating failure, abrasion resistance, including replacement of failed units.
C. Replacements Under Warranties: Provide same warranty as original glass and glazing, beginning from date of replacement completion for glass units replaced under Warranty provisions.

PART 2 - PRODUCTS
2.01 GLAZING TYPES
A. Type IG-1 - Sealed Insulating Glass Units: Vision glazing, low-E.
   1. Application(s): All exterior glazing unless otherwise indicated.
   2. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
      a. Tint: As selected.
      b. Coating: Low-E type, on #2 surface.
   3. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
a. Tint: Clear.
6. Total Thickness: 1 inch.

B. Type IG-2 - Sealed Insulating Glass Units: Safety glazing:
1. Applications: Provide this type of glazing in the following locations:
   a. Glazed lites in exterior doors.
   b. Glazed sidelights and panels next to doors.
   c. Other locations required by applicable federal, state, and local codes and regulations.
   d. Other locations indicated on the drawings.
2. Type: Same as other vision glazing except use fully tempered float glass for both outboard and inboard lites.

C. Type S-2 - Fire-Protection-Rated Glazing:
2. Safety Certification: 16 CFR 1201 Category II.
3. Applications: Provide this type of glazing in the following locations:
   a. Glazed lites in fire doors.
   b. Fire windows.
   c. Sidelights, borrow lites, and other glazed openings in partitions indicated as having an hourly fire rating.
   d. Other locations indicated on the drawings.
4. Fire Rating: As indicated on the drawings.
5. Type: Glass-ceramic safety glazing.
7. Glazing Method: As required for fire rating.

D. Mirror Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality Q1 (mirror select); silvering, protective coating and physical characteristics complying with ASTM C1503; 6 mm minimum thick.
1. Sizes noted on Drawings.

2.02 EXTERIOR GLAZING ASSEMBLIES
A. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with ASCE 7.
1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
3. Thicknesses listed are minimum.

2.03 GLASS MATERIALS
A. Fire-Protection-Rated Glazing: Type, thickness, and configuration as required to achieve indicated ratings.
1. IBC Fire Protection Rating: As indicated on drawings.
2. Provide products listed by Underwriters Laboratories or Intertek Warnock Hersey.
3. Labeling: Provide permanent label on each piece giving the IBC rating and other information required by the applicable code.

B. Glass-Ceramic Safety Glazing: UL- or WH-listed as fire-protection-rated glazing and complying with 16 CFR 1201 test requirements for Category II without the use of a surface-applied film.

C. Mirror Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality Q1 (mirror select); silvering, protective coating and physical characteristics complying with ASTM C1503; 6 mm minimum thick.
   1. Sizes noted on Drawings.

2.04 SEALED INSULATING GLASS UNITS

A. Manufacturers:
   1. Any of the manufacturers specified for float glass.
   2. Any fabricator certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty, if any.
   3. Substitutions: Refer to Section 01600 - Product Requirements.

B. Sealed Insulating Glass Units: Types as indicated.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   2. Edge Spacers: Aluminum, bent and soldered corners.
   3. Edge Spacer Color: As selected by Architect.
   4. Edge Seal: Glass to elastomer with supplementary silicone sealant.
   5. Purge interpane space with dry argon air.

2.05 GLAZING COMPOUNDS

A. Manufacturers:
   5. Substitutions: Refer to Section 01600 - Product Requirements.

B. Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; grey color.

C. Butyl Sealant: Single component; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; Shore A hardness of 10 to 20; black color; non-skinning.

D. Acrylic Sealant: Single component, solvent curing, non-bleeding; ASTM C 920, Type S, Grade NS, Class 12-1/2, Uses M and A; cured Shore A hardness of 15 to 25; color as selected.

E. Polysulfide Sealant: Two component; chemical curing, non-sagging type; ASTM C 920, Type M, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; black color.

F. Polyurethane Sealant: Single component, chemical curing, non-staining, non-bleeding; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; Shore A Hardness Range 20 to 35; color as selected.

2.06 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; black color.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; color as selected.

E. Glazing Clips: Manufacturer's standard type.

PART 3 - EXECUTION

3.01 EXAMINATION
A. Verify that openings for glazing are correctly sized and within tolerance.
B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION
A. Clean contact surfaces with solvent and wipe dry.
B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
C. Prime surfaces scheduled to receive sealant.
D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.
E. Install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)
A. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.04 INSTALLATION - EXTERIOR DRY METHOD (TAPE AND GASKET SPLINE GLAZING)
A. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with butyl sealant.
B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
D. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
E. Trim protruding tape edge.

3.05 INSTALLATION - EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)
A. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.
B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
C. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
D. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.
E. Install removable stops, with spacer strips inserted between glazing and applied stops, 1/4 inch below sight line. Place glazing tape on glazing pane or unit with tape flush with sight line.
F. Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.
G. Apply cap bead of sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.06 INSTALLATION - EXTERIOR BUTT GLAZED METHOD (SEALANT ONLY)
A. Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
B. Temporarily secure a small diameter non-adhering foamed rod on back side of joint.
C. Apply sealant to open side of joint in continuous operation; thoroughly fill the joint without displacing the foam rod. Tool the sealant surface smooth to concave profile.
D. Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.
E. Remove masking tape.

3.07 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)
A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.
B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
D. Place glazing tape on free perimeter of glazing in same manner described above.
E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
F. Knife trim protruding tape.

3.08 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT)
A. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.
B. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
D. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.
E. Fill gaps between pane and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.
F. Trim protruding tape edge.

3.09 INSTALLATION - INTERIOR WET METHOD (COMPOUND AND COMPOUND)
A. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch centers, kept 1/4 inch below sight line.
B. Locate and secure glazing pane using glazers' clips.
C. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.10 INSTALLATION - MIRRORS
A. Install mirrors in accordance with GANA recommendations.
B. Install mirrors in correctly sized openings, using setting blocks (neoprene 80 to 90 Shore A durometer hardness), spacer shims, stainless steel clips, and adhesive compatible with mirror coating and wall substrate.
C. Set mirrors plumb and level, free of optical distortion.
D. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

3.11 MANUFACTURER'S FIELD SERVICES
A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
B. Monitor and report installation procedures and unacceptable conditions.

3.12 CLEANING
A. Remove glazing materials from finish surfaces.
B. Remove labels after Work is complete.
C. Clean glass and adjacent surfaces.

3.13 PROTECTION
A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION 08800
SECTION 09260
GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Metal stud wall framing.
B. Metal channel ceiling framing.
C. Fire rated area separation walls.
D. Fiber reinforced backing board.
E. Gypsum wallboard.
F. Moisture-Resistant board.
G. High-Impact gypsum board.
H. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this Section.
B. Section 05400 - Cold Formed Metal Framing: Exterior wind-load-bearing metal stud framing.
C. Section 06100 - Rough Carpentry: Wood blocking product and execution requirements.
D. Section 07212 - Thermal Insulation: Acoustic insulation; and sealants at sheathing.
E. Section 07840 - Firestopping: Top-of-wall assemblies at fire rated walls.
F. Section 07900 - Joint Sealers: Acoustic sealant.

1.03 REFERENCE STANDARDS
F. 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; 2011.
N. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2010.

1.04 SUBMITTALS
A. See Section 01300 - 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, glass mat faced gypsum board, accessories, and joint finishing system.
D. Test Reports: For all stud framing products that do not comply with ASTM C645 or C 754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.05 QUALITY ASSURANCE
A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.
   1. Maintain one copy of standards at project site.
   2. Where indicated, provide materials and construction which are identical with those of assemblies whose fire resistance rating has been determined per ASTM E 119 by a testing and inspecting organization acceptable to authorities having jurisdiction.
B. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 3 years of documented experience.
C. Single Source Responsibility: Comply with one of the following:
   1. Obtain all steel framing and all metal trim from a single manufacturer.
   2. Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.
   3. Provide a confirmation letter from both the gypsum board manufacturer and the joint compound manufacturer that their products are compatible and warrantable if used together.
D. Pre-Construction Conference: Prior to beginning work associated with roof system, the Contractor and appropriate subcontractors shall meet to discuss coordination of the work of the trades associated with the installation of the roof system, suspended acoustical and gypsum board ceiling, suspended mechanical ductwork, suspended light fixtures, etc. This work shall be planned and coordinated to
provide hanger attachments needed by the various trades in a manner that will minimize conflict with installation of the roof system.

1.06 REGULATORY REQUIREMENTS
   A. Conform to applicable code for fire rated assemblies as indicated on drawings.

1.07 DELIVERY, STORAGE AND HANDLING
   A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.
   B. Store materials inside, under cover, and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.
   C. When materials are moved into the building, distribute pallets and loads evenly around work areas so as to avoid overloading structure, causing damage to any materials, interfering with work of other trades, etc.
   D. Handle gypsum boards to prevent damage to edges, ends and surfaces. Do not bend or otherwise damage metal corner beads, trim, etc.

PART 2 - PRODUCTS

2.01 METAL FRAMING MATERIALS
   A. Manufacturers - Metal Framing, Connectors, and Accessories:
      5. United States Gypsum Company
   B. Non-Loadbearing Framing System Components:  ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf. Install with flange edges bent back 90 deg. and doubled over to form 3/16-inch minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and minimum depth as follows:
      1. Metal studs at interior partitions shall be 3-5/8-inches x 20 gauge (362 S162-33), 6-inches x 20 gauge (600 S162-33), or 8-inches x 18 gauge (800 S162-43) at locations indicated on the Drawings, spaced at 16-inches o.c., unless otherwise indicated below or otherwise shown on drawings or required by project conditions. Stud width shall be 1-5/8-inches unless otherwise indicated.
      2. Jamb studs shall be no less than 20 gauge.
         a. Studs shall be joined together at 4'-0" intervals.
      3. Use double studs or 6-inch studs, as indicated or as otherwise required, for chase walls, piping, conduits, or etc.
      4. Metal studs at shaft wall or similar construction shall be type, thickness, depth and configuration indicted, or if not indicated, not less than the studs used in the tested assembly. Minimum thickness of 3-5/8-inch studs shall be 22 gauge, and of 6-inch studs shall be 20 gauge.
      5. Special stud tracks for curved walls shall be equivalent to "Flex-C Trac" galvanized flexible segmented track with slidable side straps, as manufactured by Flex-Ability Concepts, Inc.; Oklahoma City, OK.
7. Ceiling Channels: C shaped.

C. Exterior Non-Loadbearing Studs and Furring for Application of Gypsum Board: As specified in Section 05400.

D. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05400.
1. Studs: "C" shaped with flat or formed webs.
2. Any interior load-bearing studs shall be at least 6-inches depth x 18 gauge (600S162-43), or 8-inches x 18 gauge (800S162-43), unless otherwise indicated on Drawings - galvanized C-studs spaced at 16-inches o.c.

E. Steel Framing Components for Suspended and Furred Ceilings:
1. General: Provide components which comply with ASTM C 754 for materials and sizes, unless otherwise indicated.
2. Wires for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
3. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
4. Steel Studs for Furring Channels: ASTM C 645, with flange edges bent back 90 deg. and doubled over to form 3/16-inch minimum lip (return), minimum thickness of base (uncoated) metal and minimum depth as follows:
   a. Thickness: 20 gauge, unless otherwise indicated.
   b. Depth: As indicated.
   c. Spacing: As indicated in referenced standard and on drawings, but no less than at all edges and 24-inches o.c.
5. Steel Rigid Furring Channels: ASTM C645, hat-shaped, depth of 7/8-inch, and minimum thickness of base (uncoated) metal as follows:
   a. Thickness: 20 gauge at interior and 18 gauge at exterior, unless otherwise indicated.
   b. Spacing: As indicated in referenced standard and on drawings, but not less than at all edges and 16-inches o.c.
   1) At ceilings and soffits indicated to receive more than a single layer of gypsum board, spacing shall be not less than at all edges and 16-inches o.c.
6. Grid Suspension System: ASTM C 645, manufacturer's standard grid suspension system composed of main beams and cross furring members which interlock to form a modular supporting network.
   a. Locations for Use: Provide grid type suspension systems for sloped and horizontal ceiling applications of interior gypsum board products which are not attached directly to primary framing system; Minimum 4-feet x 4-feet grid and cross tees at 2-feet o.c., with minimum installation requirements as required by manufacturer's current written instructions, referenced standards, and as indicated in this Section and Section 09511 - "Acoustical Panel Ceilings". Provide and comply with manufacturer's published requirements for accessories, trim and hanger wire, and as otherwise required to provide flat ceilings without deflection or sag.
   b. Product/Manufacturer: Provide suspended modular grid furring system equivalent to standard drywall suspension system for flat ceilings, with 1-1/2-inch grid faces, and as follows:
      1) Equivalent to "Drywall Suspension System", as manufactured by USG Interiors, or one of the other above named manufacturers.

F. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
G. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and screwed to secondary deflection channel set inside but unattached to top track.
   1. Bottom Track: Unless otherwise indicated or required by project conditions, fire-ratings, etc., provide manufacturer's standard Deep Leg Tracks, unpunched unless otherwise indicated, of size, shape and gauge indicated, with 1-5/16-inch flange.
   2. Deflection Track: Typical at stud walls up to slab or similar fixed structure at top of walls: Provide for no less than 1" of vertical movement, equivalent to one of the following:
      a. Dietrich Double Track System
      b. Dietrich Track-Over-Track System
      c. Dietrich SLP-TRK slotted track system
      d. Dietrich TR-Series with Spazzer 9200 Bar (SPZD)
   3. Special stud tracks for all curved walls shall be equivalent to "Flex-C Trac" galvanized flexible segmented track with slidable side straps, as manufactured by Flex-Ability Concepts, Inc.; Oklahoma City, OK.
   4. Special stud tracks for all arched walls shall be equivalent to "Flex-C Arch" galvanized flexible segmented track with slidable straps, as manufactured by Flex-Ability Concepts, Inc.; Oklahoma City, OK.
   5. Provide deflection track at exterior wall and floor-to-floor walls - typical.

H. Continuous Horizontal Bridging/bracing:
   1. 1-1/2-inch cold-rolled channels (galvanized).
   2. Spacing: 4'-0" or 4'-6" o.c. vertically, through pre-punched slots in studs.
   4. Anchors (bridging channels to studs): 1-1/2-inches x 2-inches x 16 gauge clip angle, 1/4-inch less than stud width, secured with four (4) 5/8-inch S-14 screws. (Anchors required at ends of runs, where snap-in fit to stud slots is not snug or allows stud to move/slide on channels, and at studs on each side of splices in bridging channels).

2.02 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:

B. Impact-Rated Wallboard: Tested to Level 3 soft-body and hard-body impact in accordance with ASTM C1629.
   1. Application: Up to 4'-0" AFF in Court Lobby 101, unless indicated otherwise.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Paper-Faced Type: Gypsum wallboard as defined in ASTM C1396/C1396M.
   4. Type: Fire-resistance rated Type X, UL or WH listed.
   5. Thickness: 5/8 inch.
   7. Products:
b. Temple-Inland Inc; ComfortGuard IR Impact Resistant.
c. Substitutions: See Section 01600 - Product Requirements.

C. Gypsum Wallboard: Paper-faced as defined in ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut, and as follows:
1. Application: Use for vertical surfaces and horizontal surfaces, unless otherwise indicated.
2. Fire Resistant Type: Type X at all locations, unless other type is required by indicated tested assembly.

D. Moisture and Mold-Resistant Paper-Faced Products:
1. Core Type: Type X.
2. Thickness: 5/8 inch.
4. Application: At rooms with toilet fixtures and/or service sinks, entire wall behind sinks, and elsewhere as indicated or wherever water-resistant gypsum board is indicated.
5. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
6. Product:
   a. USG Sheetrock brand "Mold Tough" gypsum panels.
   b. Temple-Inland "ComfortGuard Mold Resistant Gypsum Board".
   c. Substitutions: See Section 01 6000 - Product Requirements.

E. Backing Board For Tile:
1. Fiber-Reinforced Gypsum Panels: As defined in ASTM C1278, mold-resistant, and with water-resistant core. No paper face.
2. Thickness: 5/8 inch.
3. Product:
   a. USG Fiberock brand "Aqua-Tough" Tile backerboard.
   b. Temple-Inland "GreenGlass Tile Backer".
   c. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES
A. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless otherwise indicated.
1. Types: As detailed or required for finished appearance.
2. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead, L-bead, and LC-bead at exposed panel edges.

B. Extruded Moldings and Reveal Moldings: Provide manufacturer's standard alloy 6063-T5 extruded units with 70% resin 2-coat "Kynar 500" baked enamel finish, and as follows:
1. Design: Provide shapes and configurations as indicated on the Drawings.
   a. Form reveal moldings to cover at least two sides and rear of reveal.
   b. At drywall (or plaster) edge, provide continuous expanded metal edge, designed for mudding-in.
   c. At ceiling grid edge, provide continuous edge designed for compatibility with lay-in ceiling grid.
2. Color: To match ceiling grid in same room where occurs, unless indicated otherwise, and color as selected by Architect at any exterior locations.
C. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, coated glass fiber tape for joints and corners of glass-mat faced boards, and where recommended by manufacturer. Joint material shall be compatible with and approved by air barrier manufacturer, where applicable.
   2. Tape: 2 inch wide, creased paper tape for joints and corners of paper faced boards, and where recommended by manufacturer.
   4. Chemical hardening type compound.

D. Level 5 Surface System Options:
   1. High Build Drywall Surfacer: 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.

E. Screws for Attachment to Steel Members Less Than 0.03 inch in Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.

F. Screws for Attachment to Steel Members From 0.033 to 0.112 Inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.

G. Fasteners: Provide fasteners of type, material, size, corrosion resistance, holding power and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum drywall manufacturers for applications indicated.

H. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.

I. Screws: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs.

J. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

K. Adhesive for Attachment to Wood: ASTM C557.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.
   1. Environmental Requirements, General: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C 840, with gypsum board manufacturer's recommendations, and with adhesive manufacturer's recommendations, for before, during, and after installation.
   2. Minimum Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40º.
   3. Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

3.02 SEQUENCING AND SCHEDULING

A. Sequence installation of gypsum board and sheathing with installation of exterior cladding and roofing to comply with requirements indicated below:
   1. Do not leave gypsum sheathing board exposed to weather after its application for more than one month or, if protected as indicated below, for more than 6 months, unless otherwise warranted by manufacturer:
a. Cover exterior surface of sheathing with a temporary air infiltration barrier equivalent to 6-mil polyethylene film. Apply covering immediately after sheathing is installed.
b. Remove covering just prior to installation of asphalt felt, face brick, and similarly applied exterior materials.

3.03 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Do not bridge building expansion and control joints with steel framing or furring members; independently frame both sides of joints with framing or furring members or as indicated.

C. Suspended Ceilings and Soffits: Space framing and furring members at 16 inches on center minimum.
   1. Level ceiling system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.
   3. Suspend ceiling hangers from building structural members and as follows:
      a. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, counter splaying, or other equally effective means.
      b. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapeze or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
      c. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
      d. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure as well as for type of hanger involved, and in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
      e. Secure hangers to structural support by connecting directly to structure where possible; otherwise, connect to anchorage devices or fasteners as indicated or required.
      f. Do not support ceilings directly from permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
      g. Do not attach hangers to steel deck tabs.
      h. Do not attach hangers to steel roof deck. Attach hangers to structural members.
      i. Do not connect or suspend steel framing from ducts, pipes or conduit.
      j. Keep hangers and braces 2-inches clear of ducts, pipes and conduits.
      k. Sway-brace suspended steel framing with hangers used for support.
      l. Install suspended steel framing components in sizes and at spacing indicated but not less than that required by referenced steel framing installation standard
         1) Wire Hangers: 0.1620-inch diameter (8 gauge), 4-feet on center. Install supplementary hangers as necessary at ceiling fixtures to provide a hanger at each corner of each fixture, diffuser, grille, and other ceiling-mounted equipment.
m. Grid Suspension System: Attach perimeter wall track or angle where grid suspension system meets vertical surfaces. Mechanically join main beam and cross furring members to each other and butt-cut to fit into wall track.

4. Install bracing as required at exterior locations to resist wind uplift.

D. Studs: Space studs as permitted by standard.
1. Extend partition framing to structure in all locations unless otherwise indicated.
2. Installation Tolerances: Install each steel framing and furring member so that fastening surface does not vary more than 1/8-inch from plane of faces of adjacent framing.
3. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
4. Extend non-bearing wall partition framing to 6 inches above adjacent ceiling heights, except where partitions are indicated to terminate at suspended ceilings.
   a. Provide studs up to tie to structure at 4'-0" o.c. minimum, from partitions terminating below ceilings
5. Install steel studs and furring in sizes and at spacings, indicated but not less than that required by referenced steel framing installation standard.
6. Install steel studs so that flanges point in the same direction and gypsum boards can be installed in the direction opposite to that of the flange.
7. Install horizontal steel bridging/bracing in all walls, and the additional strap bracing at curved walls as steel framing progresses. Install in compliance with stud manufacturer's recommendations, at spacing indicated
   a. Galvanized steel strap bracing shall be provided continuous at top and bottom runner tracks and at bridging locations at all curved stud walls.
8. Isolate steel framing from building structure to prevent transfer of loading imposed by structural movement, at locations indicated below to comply with details shown on Drawings:
   a. Where edges of suspended ceilings abut building structure horizontally at ceiling perimeters or penetration of structural elements.
   b. Where partition and wall framing abuts overhead structure:
      1) Unless framing is specifically indicated to terminate below ceilings, all framing and gypsum board shall extend up to bottom of structure above.
9. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
10. Install runners (tracks) at floors, ceilings and structural walls and columns, where gypsum drywall stud system abuts other construction.

E. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
1. Frame door openings to comply with details indicated, with GA-219 and with applicable published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
   a. Extend vertical jamb studs (double studs-typical) through suspended ceilings and attach to underside of floor or roof structure above, unless otherwise indicated.
2. Frame openings other than door openings to comply with details indicated, or if none indicated, in same manner as required for door openings; and install framing below sills of openings to match framing required above door heads.
3. Spot grout hollow metal doors for solid core wood doors, hollow metal doors and doors over 32-inches wide. Apply spot grout at each jamb anchor clip just before inserting board into frame.

F. Standard Wall Furring: Install at concrete and masonry 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.

1. Orientation: Horizontal.
2. Spacing: At 16 inches on center minimum.

G. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.

H. Blocking: Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, wood frame openings, toilet accessories, hardware, and heavy trim, shelving, furnishings and equipment services. Bolt or screw steel channels to studs. Comply with Section 06100 for wood blocking.

3.04 BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. General application and finishing of gypsum Board:

1. Cut boards as recommended by manufacturer.
2. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 24-inches in alternate courses of board.
3. Install ceiling boards across framing in the manner which minimizes the number of end-butt joints, and which avoids end joints in the central area of each ceiling. Stagger end joints at least 24- inches.
4. Install wall/partitions boards in manner which minimizes the number of end-butt joints or avoids them entirely where possible. At high walls, install boards horizontally with end joints staggered over studs.
5. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16-inch open space between boards. Do not force into place.
6. Locate either edge or end joints over supports, except in horizontal applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
7. Attach gypsum board to steel studs so that leading edge or end of each board is attached to open (unsupported) edge of stud flange first.
8. Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.

a. Cover both faces of steel stud partition framing with gypsum board in concealed spaces (above ceilings, etc.), except inside double or chase walls which are required to be braced internally.

1) Except where concealed application is required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. area, and may be limited to not less than 75% of full coverage.
2) Fit gypsum board around ducts, pipes, and conduits.
3) Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4-to-1/2-inch-wide joints to install sealant.

b. Fire-stop around penetrations as required by Codes and authorities having jurisdiction. Refer to Section 07840 for additional information and requirements.

9. Where interior partitions are indicated to extend to the structure above, the drywall shall also extend to the structure with the same number of layers as required below the ceiling.

10. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4-inch to 1/2-inch space and trim edge with "U" bead edge trim. Seal joints with acoustical sealant.

11. Gypsum panels applied to walls shall be applied with the bottom edge spaced a minimum of 1/4-inch above the floor.

12. At all interior walls, seal construction at perimeters of partition, partition intersections, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim, and close off sound-flanking paths around or through construction, including sealing of partitions above acoustical ceilings.

a. Offset boxes and similar openings minimum of one stud space, and insulate behind openings.

b. Openings cut into wall for boxes shall leave maximum gap of 1/4" around box.

c. Seal around box completely with acoustical sealant, or gasket recommended by manufacturer for acoustic isolation.

13. Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations.

C. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

1. Install gypsum wallboard as follows:

a. On ceilings apply gypsum board prior to wall/partition board application to the greatest extent possible.

b. On partitions/walls apply gypsum board vertically (parallel to framing), unless otherwise indicated or required for fire or smoke resistive rated assemblies. Provide maximum length panels, to minimize end joints.

c. On partitions/walls 8'-1" or less in height apply gypsum board horizontally (perpendicular to framing); use maximum length sheets possible to minimize end joints.

2. Single-Layer Fastening Methods: Apply gypsum boards to supports as follows:

a. Fasten with screws.

D. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

1. Install gypsum backing board for base layer and gypsum wallboard for face layer.

2. On ceilings apply base layer(s) prior to base layer application on walls/partitions; apply face layers in same sequence. Offset joints between layers at least 10-inches. Apply base layers at right angles to supports unless otherwise indicated.

3. On partitions/walls apply base layer(s) and face layers vertically (parallel to framing) with joints of base layers over supports and face layer joints offset at least one stud or furring member space from base layer joints.
4. Multi-Layer Fastening Methods:
   a. Apply base layer(s) of gypsum board and face layer to base layer(s) as follows:
   b. Fasten both base layer(s) and face layer separately to supports with screws

E. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

F. Fiber-Reinforced Gypsum Panels: Install in strict accordance with manufacturer's instructions.

G. Glass Mat Faced Gypsum Board: Install in strict accordance with manufacturer's instructions.

H. Installation on Metal Framing: Use screws for attachment of all gypsum board.

I. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority.
   For non-rated assemblies, install as follows:

J. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board with sealant.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.

B. Control Joints: Place control joints consistent with lines of building spaces, as indicated on drawings or as follows:
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
   2. At exterior soffits, not more than 30 feet apart in both directions.
   3. Install control joints at spacings and locations required by referenced gypsum board application and finish standard, and approved by the Architect for visual effect.

C. Corner Beads: Install at external corners, using longest practical lengths.

D. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.06 JOINT TREATMENT

A. General: Apply treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects and elsewhere as required to prepare work for decoration.

B. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.
   1. Joint tape and joint compound shall be compatible with waterproofing subsequently applied.


D. Fiber Reinforced Gypsum and Cement Board: Use alkali-resistant glass fiber tape, recommended by manufacturer, embedded in latex-fortified mortar or latex-based Type 1 mastic over the joint. Use same material as specified for tile setting.

E. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
4. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
5. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.

F. 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.
   2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
   3. Taping, filling and sanding is not required at base layer of double layer applications.

G. Prefill open joints and rounded or beveled edges, if any, using setting-type joint compound.

H. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.

I. Finish interior gypsum wallboard by applying the following joint compounds in 3 coats (not including prefill of openings in base), and sand between coats and after last coat:
   1. Embedding and First Coat: Ready-mix drying-type all-purpose or taping compound.
   2. Fill (Second) Coat: Ready-mix drying-type all-purpose or topping compound.
   3. Finish (Third) Coat: Ready-mix drying-type all-purpose or topping compound.

J. Water-Resistant Gypsum Board and Exterior Gypsum Board: Finish joints between water-resistant backing board with tape and setting-type joint compound to comply with gypsum board manufacturer's written recommendations and installation standards referenced in related sections.

K. Partial Finishing: Omit third coat and sanding on concealed drywall construction which is indicated for drywall finishing, except where finishing is required to achieve fire-resistance rating, sound rating or to act as air or smoke barrier

L. 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.

3.07 CLEANING AND PROTECTION OF WORK
A. Promptly remove any joint compound and adhesives and similar residue from adjacent surfaces, as it may occur.
B. Provide final protection and maintain conditions, in a manner suitable to Installer, which ensures gypsum drywall construction remain without damage or deterioration at time of Substantial Completion.

3.08 TOLERANCES
A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.09 FINISH LEVEL SCHEDULE
A. Level 1: Above finished ceilings concealed from view.
B. Level 2: Utility areas and areas behind cabinetry.
C. Level 3: Walls scheduled to receive textured wall finish.
D. Level 4: Walls and ceilings scheduled to receive flat or eggshell paint finish.
E. Level 5: Walls and ceilings scheduled to receive semi-gloss or gloss paint finish.

END OF SECTION 09260
SECTION 09511  
SUSPENDED ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Suspended metal grid ceiling system.
B. Acoustical units.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 07212 - Board and Batt Insulation: Acoustical insulation.
C. Section 07900 - Joint Sealers: Acoustical sealant.

1.03 REFERENCE STANDARDS

1.04 ADMINISTRATIVE REQUIREMENTS
A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
C. Product Data: Provide data on suspension system components and acoustical units.
D. Samples: Submit two samples 6x6 inch in size illustrating material, edge detail and finish of acoustical units.
E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed (but not less than 100 SF) for each type of acoustical unit.

1.06 QUALITY ASSURANCE
A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS
A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.08 PROJECT CONDITIONS
A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
B. Install acoustical units after interior wet work is dry.

PART 2 - PRODUCTS

2.01 ACOUSTICAL UNITS
A. Manufacturers:
   4. Substitutions: See Section 01600 - Product Requirements.
B. Acoustical Panels (LAC-1): Painted mineral fiber, ASTM E 1264 Type III with the following characteristics:
   1. Size: 24 x 24 inches.
   2. Thickness: 5/8 inches.
   3. Light Reflectance: 0.85 percent, determined as specified in ASTM E 1264.
   4. NRC Range: 0.55, determined as specified in ASTM E 1264.
   5. Edge: Square Lay-In.
   7. Surface Pattern: Medium Texture.
   11. Suspension System: Exposed grid, 15/16 in.
   12. Class A (UL).

2.02 SUSPENSION SYSTEM(S)
A. Manufacturers:
   1. Same as for acoustical units, and as indicated.
   2. Substitutions: See Section 01600 - Product Requirements.
B. Suspension Systems - General: ASTM C635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.
C. Exposed Steel Suspension System: Formed galvanized steel, commercial quality cold rolled; intermediate-duty.
   1. Products: 15/16-inch Exposed Tee Grid, equal to Prelude by Armstrong.
2.03 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same material and finish as grid.
   1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

C. Acoustical Sealant For Perimeter Moldings: Specified in Section 07900.

D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
C. Locate system on room axis according to reflected plan.
D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
I. Do not eccentrically load system or induce rotation of runners.
J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Install in bed of acoustical sealant.
   2. Use longest practical lengths.
   3. Overlap corners.
K. Form expansion joints as detailed. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.
B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
C. Lay directional patterned units with pattern parallel to longest room axis.
D. Fit border trim neatly against abutting surfaces.
E. Install units after above-ceiling work is complete.
F. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
G. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.
   3. Double cut and field paint exposed reveal edges.
H. Where round obstructions occur, provide preformed closures to match perimeter molding.
I. Install hold-down clips on panels within 20 ft of an exterior door.

3.04 TOLERANCES
A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION 09511
SECTION 09650
RESILIENT FLOORING

PART 1  GENERAL

1.01 SECTION INCLUDES
A. Resilient tile flooring.
B. Resilient base.
C. Resilient stair accessories.
D. Installation accessories.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 03300 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
C. Shop Drawings: Indicate seaming plan.
D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
E. Verification Samples: Submit two samples, 9x9 inch in size illustrating color and pattern for each resilient flooring product specified.
F. Concrete Testing Standard: Submit a copy of ASTM F710.
G. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.
H. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: Provide minimum of 5% of each type and color.
   3. Extra Wall Base: Provide minimum of 5% of each type and color.

1.05 MOCK-UP
A. See Section 01400 - Quality Requirements, for general requirements for mock-up.
B. Construct VCT tile mock-up where indicated on the drawings or where directed by Architect, indicating all colors and patterns on drawings.
   1. Approved mock-up may remain as part of the Work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect roll materials from damage by storing on end.

1.07 FIELD CONDITIONS

A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Vinyl Composition Tile (VCT): Homogeneous, with color extending throughout thickness, and:
   1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
   2. Size: 12 x 12 inch.
   3. Thickness: 0.125 inch.
   5. Manufacturers:
      c. Substitutions: See Section 01600 - Product Requirements.

B. Feature Strips: Of same material as tile.

2.02 STAIR COVERING

A. Stair Treads: Rubber; full width and depth of stair tread in one piece; tapered thickness; nosing not less than 1-5/8 inch deep.
   1. Minimum Requirements: Comply with FS RR-T-650 requirements corresponding to type specified.
   2. Nominal Thickness: 0.1875 inch.
   4. Style: Contrasting color abrasive grit strips full width.
   6. Manufacturers:
      d. Substitutions: See Section 01600 - Product Requirements.

2.03 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows:
   1. Height: 4 inch.
   2. Thickness: 0.125 inch thick.
   3. Finish: As selected by Architect.
   4. Length: Roll.
6. Accessories: Premolded external corners and end stops.

7. Manufacturers:
   d. Substitutions: See Section 01600 - Product Requirements.

2.04 ACCESSORIES
   A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
   B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
   C. Moldings, Transition and Edge Strips: Same material as flooring, except where indicated otherwise.
   D. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION
   A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
   B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
   C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
      1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
   D. Verify that concrete sub-floor surfaces are dry enough and ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
   E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION
   A. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
   B. Prohibit traffic until filler is cured.
   C. Clean substrate.
   D. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION
   A. Starting installation constitutes acceptance of sub-floor conditions.
   B. Install in accordance with manufacturer's instructions.
   C. Spread only enough adhesive to permit installation of materials before initial set.
   D. Fit joints tightly.
E. Set flooring in place, press with heavy roller to attain full adhesion.
F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
   1. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
   2. Resilient Strips: Attach to substrate using adhesive.
H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
I. Install flooring in recessed floor access covers, maintaining floor pattern.
J. At movable partitions, install flooring under partitions without interrupting floor pattern.
K. Install feature strips where indicated.

3.04 TILE FLOORING
A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless manufacturer's instructions say otherwise.
B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

3.05 RESILIENT BASE
A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
C. Install base on solid backing. Bond tightly to wall and floor surfaces.
D. Scribe and fit to door frames and other interruptions.

3.06 STAIR COVERINGS
A. Install stair coverings in one piece for full width and depth of tread.
B. Adhere over entire surface. Fit accurately and securely.

3.07 CLEANING
A. Remove excess adhesive from floor, base, and wall surfaces without damage.
B. Clean, seal, and wax in accordance with manufacturer's instructions.
   1. Apply protective floor polish to resilient flooring surfaces free from soil, excess adhesive or surface blemishes. Use commercially available, metal, cross-linked acrylic product acceptable to resilient flooring manufacturer.
      a. Coordinate selection of floor polish with Owner and/or their maintenance service.
      b. Buff floor tile and provide two (2) coats of a protective floor polish at or near the point of substantial completion.

3.08 PROTECTION
A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.09 SCHEDULE
A. See Drawings.

END OF SECTION 09650
SECTION 09680
CARPET

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Carpet, direct-glued.
B. Accessories.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 03300 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied carpet.
C. Section 09650 - Resilient Flooring: Rubber base, and transition strips.

1.03 REFERENCE STANDARDS
A. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2009.
B. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; Carpet and Rug Institute; Current Edition.

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pile and pattern, location of edge moldings and edge bindings.
C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
D. Samples: Submit two samples 12x12 inch in size illustrating color and pattern for each carpet and cushion material specified.
E. Submit two, 8 inch long samples of edge strip for each color specified.
F. Manufacturer's Installation Instructions: Indicate special procedures.
G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01600 - Product Requirements, for additional requirements.
   2. Extra Carpet: 25 sq ft of each type, color, and pattern installed.

1.05 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet with minimum three years documented experience.
B. Installer Qualifications: Company specializing in installing carpet with minimum three years experience.

1.06 FIELD CONDITIONS
A. Store materials in area of installation for minimum period of 24 hours prior to installation.
B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
C. Ventilate installation area during installation and for 72 hours after installation.

PART 2 - PRODUCTS

2.01 CARPET
A. Carpet:
   1. Product: See Finish Legend.

2.02 ACCESSORIES
A. Sub-Floor Filler: Type recommended by carpet manufacturer.
B. Adhesives - General: Compatible with materials being adhered; maximum VOC content of 50 g/L; CRI Green Label certified; in lieu of labeled product, independent test report showing compliance is acceptable.
C. Seam Adhesive: Recommended by manufacturer.
D. Contact Adhesive: Compatible with carpet material; releasable type.

PART 3 - EXECUTION

3.01 EXAMINATION
A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.
B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesives to sub floor surfaces.
C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
   1. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
D. Verify that concrete sub-floor surfaces are dry enough and ready for adhesive installation by testing for moisture emission rate and alkalinity in accordance with ASTM F710; obtain instructions if test results are not within limits recommended by carpet manufacturer and adhesive materials manufacturer.
E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION
A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
C. Clean substrate.

3.03 INSTALLATION - GENERAL
A. Starting installation constitutes acceptance of sub-floor conditions.
B. Install carpet in accordance with manufacturer's instructions and CRI Carpet Installation Standard.
C. Verify carpet match before cutting to ensure minimal variation between dye lots.
D. Lay out carpet and locate seams in accordance with shop drawings:
   1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
   2. Do not locate seams perpendicular through door openings.
   3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
   4. Locate change of color or pattern between rooms under door centerline.
   5. Provide monolithic color, pattern, and texture match within any one area.
E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 DIRECT-GLUED CARPET
A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.
B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.
C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.
D. Roll with appropriate roller for complete contact of adhesive to carpet backing.
E. Trim carpet neatly at walls and around interruptions.

3.05 CLEANING
A. Remove excess adhesive from floor and wall surfaces without damage.
B. Clean and vacuum carpet surfaces.

END OF SECTION 09680
PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints and other coatings.

C. Scope: Finish all interior surfaces exposed to view, and exterior railings, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Exposed surfaces of steel lintels and ledge angles.
   3. Mechanical and Electrical:
      a. In all areas, paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. In all areas, paint shop-primed items.
      c. Paint interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
      d. Paint dampers exposed behind louvers, grilles, to match face panels.

D. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically so indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Non-metallic roofing and flashing.
   6. Stainless steel, anodized aluminum, bronze, terne, and lead items.
   7. Marble, granite, slate, and other natural stones.
   8. Floors, unless specifically so indicated.
   9. Ceramic and other tiles.
   12. Exterior insulation and finish system (EIFS).
   14. Acoustical materials, unless specifically so indicated.
   15. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

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

B. Section 05500 - Metal Fabrications: Shop-primed items.

C. Section 05520 - Handrails and Railings.
1.03 REFERENCE STANDARDS

1.04 DEFINITIONS
   A. Conform to ASTM D 16 for interpretation of terms used in this section.

1.05 SUBMITTALS
   A. See Section 01300 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data on all finishing products and special coatings, including VOC content.
      1. List each material and cross reference to scheduled paint types, and including each specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.
   C. Samples for initial color selection in the form of manufacturer's color charts from paint/coating manufacturer intended for use.
   D. Samples: Submit two paper chip samples, 4x8 inch in size illustrating range of colors available for each surface finishing product scheduled.
   E. Samples for verification purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate. Define each separate coat, including fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
   F. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.
   G. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.
   H. Applicator certifications that are required to be in writing.
   I. Coating Maintenance Manual: Upon conclusion of the Project, the Contractor or paint manufacturer/supplier shall furnish a coating maintenance manual, such as S-W "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product / color / finish was used, product data pages, Material Safety Data Sheet (MSDS), care and cleaning instructions, and Touch-up procedures.

1.06 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
   B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum five years experience.
   C. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by paint manufacturer, and use only within the recommended limits.
D. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
   1. Notify the Architect of any problems anticipated using the materials specified, prior to proceeding with work.

E. Material Quality: Provide the manufacturer's best quality grade paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
   1. Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude approved equivalent products of other manufacturers.

F. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.

G. Lead content in pigments or other painting materials and components is not allowed.

1.07 REGULATORY REQUIREMENTS
A. Conform to applicable code for flame and smoke rating requirements for products and finishes.

1.08 DELIVERY, STORAGE, AND HANDLING
A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, pigment and vehicle constituents by volume, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
D. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers, others present or passing through or inspecting work areas (painting or any other work), and the work areas themselves are protected from fire and health hazards resulting from handling, mixing, and application of materials.

1.09 PROJECT CONDITIONS
A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
   1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer, during application, drying and curing periods.
D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
E. Minimum Application Temperature for solvent-thinned Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.10 EXTRA MATERIALS
A. See Section 01600 - Product Requirements, for additional provisions.
B. Supply 1 gallon of each color and type; store where directed.
C. Label each container with color, type, and room locations in addition to the manufacturer's label.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products from the same manufacturer to the greatest extent possible.

B. Paints:

C. Block Fillers: Same manufacturer as top coats.

D. Substitutions: See Section 01600 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Provide 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.
   3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   4. Supply each coating material in quantity required to complete entire project's work from a single production run.
   5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      b. Architectural coatings VOC limits of State in which the project is located.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Colors: As indicated on drawings
   1. In all areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
2.03 PAINT SYSTEMS - EXTERIOR
   A. Paint ME-OP-2A - Ferrous Metals, Primed, Acrylic Latex, 2 Coat:
      1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
      2. Two Coats: S-W: Sher-Cryl High Performance Acrylic, Gloss, B66-100 (<200 g/l voc).

2.04 PAINT SYSTEMS - INTERIOR
   A. Paint WI-OP-3A - Wood, Opaque, Acrylic Latex, 3 Coat:
      2. Two Coats: S-W: ProMar 200 Zero VOC Interior Latex EgShel Enamel, B20-2600 (0 g/l voc).
   B. Paint WI-TR-VS - Wood, Transparent, Varnish, Stain:
      3. One coat sealer; S-W: none required.
   C. Paint Cpp-OP-3A - Concrete, Poured and Precast, Opaque, Acrylic, 3 coats.
      1. One Coat: S-W: Loxon Concrete & Masonry Primer, A24W8300 (<100 g/l voc).
   D. Paint CI-OP-3L - Masonry, Opaque, Latex, 3 Coat:
      2. Two Coats: ProMar 200 Zero VOC Interior Latex Semi-Gloss Enamel, B31-2600 (0 g/l voc).
   E. Paint MI-OP-3A - Ferrous Metals, Unprimed, Acrylic, 3 Coat:
      1. One Coat: S-W: Pro Industrial Pro-Cryl Universal Primer, B66-310 (<100 g/l voc).
   F. Paint MI-OP-2A - Ferrous Metals, Alkyd Primed, Acrylic Finish, 2 Coat:
      1. One Coat: S-W: Touch up with alkyd primer, Kem-Kromik Universal Metal Primer, B50 Series (<420 g/l voc).
         a. Option: S-W: Pro Industrial Pro-Cryl Universal Primer, B66-310 (<100 g/l voc).
   G. Paint MgI-OP-3A - Galvanized Metals, Acrylic, 3 Coat:
      1. One Coat: S-W: Pro Industrial Pro-Cryl Universal Primer, B66-310 (<100 g/l voc).
   H. Paint CI-OP-3E - Concrete Block [Inside Face of Single-Wythe Exterior Concrete Block Walls, and in Rest Rooms], Epoxy Enamel, 3 Coat:
      1. One Coat: S-W: Cement-Plex 875 Block Filler, B42W200 (<100 g/l voc). Option: S-W: Loxon Block Surfacer, A24W200 (<100 g/l voc).
I. Paint GI-OP-3LA - Gypsum Board/Plaster, Latex-Acrylic, 3 Coat:
   2. Two Coats: S-W: ProMar 200 Zero VOC Interior Latex EgShel, B20-2600 (0 g/l voc).
      (Where Sheen is indicated "Gloss", provide Pro Industrial™ High Performance Acrylic,
       B66-600 Series, <50 g/l voc).

2.05 ACCESSORY MATERIALS
A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding
   materials, and clean-up materials required to achieve the finishes specified whether specifically
   indicated or not; commercial quality.
B. Patching Material: Latex filler.
C. Fastener Head Cover Material: Latex filler.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition
   that may potentially affect proper application.
C. Test shop-applied primer for compatibility with subsequent cover materials.
D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes
   unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION
A. Clean surfaces thoroughly and correct defects prior to coating application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result
   for the substrate under the project conditions.
C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim,
   escutcheons, and fittings, prior to preparing surfaces or finishing.
D. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair
   existing coatings that exhibit surface defects.
E. Seal surfaces that might cause bleed through or staining of topcoat.
F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and
   bleach. Rinse with clean water and allow surface to dry.
G. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali
   powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate;
   rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution
   of sodium metasilicate after thoroughly wetting with water. Allow to dry.
H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects
   after repair.
I. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent.
   Apply coat of etching primer.
J. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-PC 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

K. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

L. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

M. Interior Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

N. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

O. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's instructions.

C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply each coat to uniform appearance.

F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

G. Sand wood and metal surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

J. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Division 15 and 16 Sections for scheduling of color coding of equipment, duct work, piping, and conduit.

B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

C. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
3.05 FIELD QUALITY CONTROL
   A. See Section 01400 - Quality Requirements, for general requirements for field inspection.

3.06 CLEANING
   A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and
      remove daily from site.

3.07 PROTECTION
   A. Protect finished coatings until completion of project.
   B. Touch-up damaged coatings after Substantial Completion.

3.08 SCHEDULE - SURFACES TO BE FINISHED
   A. Paint the surfaces described in PART 2, Paint Systems Articles.

3.09 SCHEDULE - PAINT SYSTEMS
   A. Concrete, Concrete Block: Finish all surfaces exposed to view.
      1. Interior: CI-OP-3L, semi-gloss.
      2. Interior: CI-OP-3E, gloss.
   B. Gypsum Board: Finish all surfaces exposed to view.
      1. Interior Ceilings and Walls: GI-OP-3LA, eggshell (Except gloss, where indicated).
   C. Wood: Finish all surfaces exposed to view.
      1. Interior trim and frames: WI-OP-3A, eggshell.
   D. Steel Doors and Frames: Finish all surfaces exposed to view.
   E. Steel Fabrications: Finish all surfaces exposed to view.
      1. Exterior: ME-OP-3A, gloss; finish all surfaces, including concealed surfaces, before installation.
   F. Galvanized Steel: Finish all surfaces exposed to view.
      2. Interior: MgI-OP-3A, semi-gloss.

END OF SECTION 09900
SECTION 10160
METAL TOILET COMPARTMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Metal toilet compartments.
B. Urinal screens.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 06100 - Rough Carpentry: Blocking and supports.
C. Section 10800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS
B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
C. Product Data: Provide data on panel construction, hardware, and accessories.
D. Samples: Submit two samples of partition panels, 10x10 inch in size illustrating panel finish, color, and sheen.

PART 2 - PRODUCTS

2.01 MANUFACTURERS
A. Metal Toilet Compartments:
   5. Substitutions: Section 01600 - Product Requirements.

2.02 MATERIALS
A. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

2.03 COMPONENTS
A. Toilet Compartments: Baked enamelled or powder coated steel, floor-mounted headrail-braced.
B. Doors, Panels, and Pilasters: Sheet steel faces, pressure bonded to sound deadening core, formed and closed edges; corners made with corner clips or mitered, welded, and ground smooth.
   2. Door Faces: 22 gage.
GOODWYN, MILLS & CAWOOD, INC.  
GM&C PROJECT NO. ABHM130022R
B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
C. Attach panel brackets securely to walls using anchor devices.
D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
E. Field touch-up of scratches or damaged enamel finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES
   A. Maximum Variation From True Position: 1/4 inch.
   B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING
   A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
   B. Adjust hinges to position doors in partial opening position when unlatched. Return out swinging doors to closed position.
   C. Adjust adjacent components for consistency of line or plane.

END OF SECTION 10160
SECTION 10523
FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Fire extinguishers.
B. Fire extinguisher cabinets.
C. Accessories.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 1 Specification Sections apply to this Section.
B. Section 04810 - Unit Masonry Assemblies.
C. Section 06100 - Rough Carpentry: Wood blocking product and execution requirements.
D. Section 09260 - Gypsum Board Assemblies: Roughed-in wall openings.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate cabinet physical dimensions, wall bracket mounted measurements, and location.
C. Product Data: Provide extinguisher operational features and anchorage details.
D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
F. 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 Extinguisher Cabinets and Accessories:
   1. Amerex Corp.: www.amerex-fire.com
   5. Substitutions: See Section 01600 - Product Requirements.

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 for the purpose specified and indicated.

B. Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gage.
   2. Class: A:B:C.
   4. Finish: Baked polyester powder coat, red color.
   5. Extent: For all locations indicated, except kitchen or food prep areas.

C. Wet Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gage.
   1. Class: K.
   4. Temperature range: -20 degrees F to 120 degrees F.
   5. Extent: For kitchen and food prep areas.

2.03 FIRE EXTINGUISHER CABINETS

A. Metal: Formed stainless steel sheet; 0.036 inch thick base metal.

B. Cabinet Configuration: Surface mounted type, unless shown otherwise.
   1. Sized to accommodate accessories and extinguisher.
   2. Trim: rolled edge, 2.5 inch wide (unless indicated otherwise) face.

C. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with continuous piano hinges. Provide nylon catch. Door style equal to Larsens "Vertical Duo"

D. Door Glazing: Plastic, clear, 1/8 inch thick polycarbonate. Set in resilient channel gasket glazing.

E. Cabinet Mounting Hardware: Appropriate to cabinet. Pre-drill for anchors.

F. Weld, fill, and grind components smooth.

G. Finish of Cabinet Exterior Trim and Door: Stainless Steel, Type 304, brushed finish.

H. Finish of Cabinet Interior: Stainless Steel, Type 304, brushed finish.

2.04 ACCESSORIES

A. Extinguisher Brackets: Formed steel, galvanized and enamel finished.

B. Cabinet Signage: Red letters: "Fire Extinguisher".

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level in wall locations; see drawings for mounting height, or, if not indicated, at height to comply with applicable regulations of governing authorities.

C. Where exact location of cabinets and bracket-mounted fire extinguishers is not indicated, locate as directed by Architect.

D. Secure rigidly in place.
E. Install one fire extinguisher in each fire extinguisher cabinet and bracket.

END OF SECTION 10523
SECTION 10530
CANOPIES

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Work in this section includes furnishing and installation of extruded aluminum canopy.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Masonry Work - Section 04810.
C. Miscellaneous Metals - Section 05500.
D. Sheet Metal Flashing - Section 07620.
E. Sealants - Section 07900.

1.03 REFERENCE STANDARDS
D. American Architectural Manufacturer's Association (AAMA).

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's product information, specifications and installation instructions for building components and accessories.
C. Shop Drawings: Indicate all necessary plan dimensions, elevations and details. General Contractor shall verify all dimensions and provide elevations at each column, finish floor, and related soffit before releasing to manufacturer for fabrication.
D. Certification: Submit design calculations signed by a Registered Professional Engineer, licensed in Alabama. Design calculations shall state that the canopy system complies with the wind requirements of ASCE 7-95, the applicable building code, and all other governing criteria.
E. Warranty: Submit manufacturer's warranty (as described below) 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 Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience, and approved by manufacturer.
D. Wind Uplift: Provide roof and vertical panel systems including supports meeting requirements of Underwriters Laboratories, Inc. for Class 90 wind uplift resistance.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver and store all canopy components in protected areas.

1.07 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Canopy system, including materials and workmanship, shall be warranted from defects for a period of one year from substantial completion of installation.
C. Provide 10 year manufacturer warranty for canopy system remaining intact (without perceptible deformation) and completely leak-free for 10-years from date of acceptance of project (this warranty need not cover damage from winds exceeding the velocities and/or loading required by the International Building Code.
D. Provide 10 year manufacturer warranty covering finish of canopy when finished with fluoropolymer coating.

PART 2 - PRODUCTS
2.01 MANUFACTURERS
F. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS
A. Structural Components (including but not limited to decking, beams, posts, fascia, channels, tubes, angles, mounting plates and hanger rods) shall be extruded aluminum, alloy 6063-T6.
B. Fasteners: aluminum, 18-8 stainless steel or 300 series stainless steel.

2.03 COMPONENTS
A. Columns: Columns shall be radius-cornered tubular extrusion of size indicated, with cutout and internal diverter for drainage where required.
B. Beams: Beams shall be open-top tubular extrusion of size and shape indicated, top edges thickened for strength and designed to receive deck members in self-flashing manner. Provide structural ties in tops of all beams.
C. Channels, Tubes, Angles, Hanger Rods, and Mounting Plates: Structural aluminum extrusions
D. Deck: Deck shall be extruded self-flashing sections interlocking into a composite unit.
E. Fascia: Fascia shall be size and shape as indicated.
F. Flashing: Flashing shall be .040" aluminum (min.).
2.04 FABRICATION
A. Columns and gutter beams shall be designed such that the columns will be notched to receive and secure the gutter beams.
B. Support channels and beams shall be designed to receive and secure the gutter beams.
C. Beams and Columns shall be positively connected with neatly mitered corners.
D. Deck shall be manufactured of extruded modules that interlock in a self-flashing manner. Assemble deck with sufficient camber to offset dead load deflection.
E. Concealed drainage: Water shall drain from covered surfaces into integral gutter beam and be directed to ground level discharge via one or more designated support posts.

2.05 FACTORY FINISHING
A. 70% Fluoropolymer (Kynar) finish: AAMA 2605, three coat.
B. Color: Selected from manufacturer's standard colors.

PART 3 - EXECUTION
3.01 EXAMINATION
A. Verify that substrates are ready to receive work.

3.02 PREPARATION
A. Erection shall be performed after all concrete, masonry, and roofing work in the vicinity is complete and cleaned.

3.03 INSTALLATION
A. Installation shall be in strict accordance with manufacturer's recommendations and approved shop drawings.
B. Blockouts, if required, shall be provided by manufacturer, and installed by General Contractor.
C. Erect columns and beams true to line, level and plumb.
D. Aluminum columns embedded in concrete shall be protected by acrylic.
E. Downspout columns shall be filled with grout to the discharge level to prevent standing water.
F. Non-draining columns shall have weep holes installed at top of concrete to remove condensation.

3.04 CLEANING
A. After installation, entire system shall be left in a clean condition.

3.05 PROTECTION
A. Protect the finish during handling and erection.
B. Take all precautions needed to protect entire canopy system from damage during subsequent construction activity until time of Substantial Completion.

END OF SECTION 10530
SECTION 10800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Accessories for toilet rooms.
B. Grab bars.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
B. Section 06100 - Rough Carpentry: Providing blocking and support for toilet accessories.
C. Section 09260 - Gypsum Board Assemblies: Placement of blocking and reinforcing for support of toilet accessories.
D. Section 10160 - Metal Toilet Compartments.
E. Division 15 Section - Plumbing Materials.

1.03 REFERENCE STANDARDS
A. ADAAG - Americans with Disabilities Act Accessibility Guidelines.
F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate the work with the placement of reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS
A. See Section 01300 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 - PRODUCTS

2.01 MANUFACTURERS
A. Products listed are made by Bobrick Washroom Equipment, Inc.: www.bobrick.com, except where noted otherwise.
B. Other Acceptable Manufacturers:

2.02 MATERIALS
A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
B. Keys: Provide 2 keys for each accessory to Owner; master key all lockable accessories.
C. Stainless Steel Sheet: ASTM A666, Type 304.
D. Stainless Steel Tubing: ASTM A269, Type 304 or 316.
F. Mirror Glass: Float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
G. Adhesive: Contact type, waterproof.
H. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof.
I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES
A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.
B. Chrome/Nickel Plating: ASTM B456, SC 2, satin finish, unless otherwise noted.
C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.
D. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.
E. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
F. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 TOILET ROOM ACCESSORIES
A. Mirrors: Stainless steel framed, 6 mm thick float glass mirror.
   1. Size: See Drawings.
2. Frame: 0.05 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.

B. Grab Bars: Stainless steel, 1-1/4 inches outside diameter, minimum 0.05 inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
   1. Length and configuration: As indicated on drawings.
   2. Product: B-5806P manufactured by Bobrick.

C. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F 2255. Smooth concave changing area with safety strap.
   1. Style: Horizontal.
   5. Manufacturers:
      d. Substitutions: See Section 01600 - Product Requirements.

PART 3 - EXECUTION

3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify exact location of accessories for installation.
   C. See Section 06100 for installation of blocking, reinforcing plates, and concealed anchors in walls and ceilings.

3.02 PREPARATION
   A. Deliver inserts and rough-in frames to site for timely installation.
   B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION
   A. Install accessories in accordance with manufacturers' instructions.
   B. Install plumb and level, securely and rigidly anchored to substrate.
   C. Mounting Heights and Locations: As required by accessibility regulations (ANSI A117.1 and ADAAG) and as indicated on drawings.

END OF SECTION 10800
SECTION 15010

GENERAL PROVISIONS - HVAC

PART 1 - GENERAL:

1.1 SCOPE:

A. HVAC means Heating, Ventilation and Air Conditioning.
B. Provisions of this Section apply to all HVAC and Control System work.
C. Include the provisions of General, Supplementary and Special Conditions and provisions of the Specifications shall apply to and form a part of this Section.
D. Provide all labor, materials, equipment, and services necessary for the completion of all HVAC work shown or specified, except work specifically specified to be done or furnished under other sections of the Specifications. Include performing all operations in connection with the complete HVAC installation in strict accordance with the specification and applicable drawings subject to the terms and conditions of the Contract.
E. Give required notices, file drawings, obtain and pay for permits, deposits and fees necessary for the installation of the HVAC work. Obtain and pay for inspections required by laws, ordinances, rules, regulations or public authority having jurisdiction. Obtain and pay for certificates of such inspections, and file such certificates with Owner.
F. "Provide" means to furnish and install, complete and ready for operation.
G. All equipment shall be U.L. or E.T.L. Listed as an assembly.

1.2 DRAWINGS:

A. HVAC Drawings are diagrammatic and subject to requirements of Architectural Drawings. HVAC Drawings indicate generally the location of components and are not intended to show all fittings or all details of the work. Coordinate with Architectural, Structural, Electrical, Plumbing and other Building Drawings.
B. Follow the Drawings closely, check dimensions with Architectural Drawings and field conditions. DO NOT scale HVAC Drawings for location of system components.
C. Make no changes without Architect's written permission. In case of doubt, obtain Architect's decision before proceeding with work. Failure to follow this instruction shall make the Contractor liable for damage to other work and responsible for removing and repairing defective or mislocated work.
D. Do not scale Drawings to locate ceiling diffusers. Coordinate with lighting, ceiling grids and/or reflected ceiling plans.

1.3 APPLICABLE CODES AND STANDARDS:

A. Comply with the current editions of the following Codes and Standards:
1. ANSI/ASHRAE 15 - Code for Building Services Piping.
8. Other Standard as referenced in other Sections of Divisions 15.
12. Local Mechanical Code (International Mechanical Code if no local Code in effect).

1.4 QUALIFICATIONS OF SUBCONTRACTOR:
A. The HVAC Contractor shall meet the following qualifications:

1. The HVAC Contractor must be approved by the Architect.
2. The HVAC Contractor shall have been in business as a HVAC Contractor for at least three (3) years prior to Bid Date. The HVAC Contractor shall have held a license from the Alabama State Licensing Board for General Contractors for at least three (3) years prior to Bid Date.
3. The HVAC Contractor shall have a satisfactory experience record with HVAC installations of character and scope comparable with this project and have completed five projects of the same cost (or more) as the cost of this project, and for at least three (3) years prior to the Bid Date shall have had an established service department capable of providing service inspection or full maintenance contracts.
4. Contractor must have bonding capacity for project of this size and must bond the project.

1.5 CONFLICTS AND INTERFERENCES:
A. If systems interfere or conflict, the Architect shall decide which equipment to relocate regardless of which was first installed.

1.6 WORKMANSHIP:
A. Do all work in a neat and first-class manner. Remove and replace work not done in such manner as
1.7 **COOPERATION:**

A. Cooperate with all other crafts. Perform work in a timely manner. Do not delay the execution of other work.

1.8 **VISITING SITE:**

A. Visit site and become familiar with location and various conditions affecting work. No additional allowance will be granted because of lack of knowledge of such conditions.

**PART 2 - PRODUCTS:**

2.1 **MATERIALS, SUBSTITUTIONS AND SUBMITTALS:**

A. Unless otherwise noted, provide new, standard, first-grade materials throughout. Equipment and materials furnished shall be fabricated by manufacturer regularly engaged in their production and shall be the standard and current model for which replacement parts are available. HVAC equipment shall be substantially the same equipment of a given manufacturer which has been in successful commercial use and operation for at least three (3) years.

B. Where materials or products are specified by manufacturer's name, brand, trade name, or catalog reference, such named materials or products shall be the basis of the Bid, without substitution, and shall be furnished under the Contract unless requests for substitutions are approved as noted below. Where two or more brands are named the choice of these shall be optional with the Contractor.

C. Substitutions will be considered only if written request for approval has been received by the Architect ten (10) days prior to the date established for receipt of Proposals. Each request shall include the name of the material or equipment for which substitution is proposed, specification section/paragraph number and a complete description of the proposed substitute including drawings, cuts, performance and test data, samples and any other information necessary for evaluation. A statement setting forth any changes in other materials, equipment or other Work that incorporation of the substitute may require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution is final.

D. If the Architect approves any proposed substitution prior to receipt of Proposals, approval will be set forth in an Addendum. Do not rely upon approvals made in any other manner. Prior approval to be secured for "equal" or "approved equal" manufacturer.

E. No substitutions will be considered after the Contract has been executed, except as described in the General Conditions.

F. Submittal data and shop drawings, except controls, shall be submitted at one time, partial submittals will not be considered. Provide submittal in three (3) ring binders with tab sheets for each major item of equipment. Before ordering materials and equipment, submit to Architect and obtain his approval of a detailed list showing each item which is to be furnished by make, trade name, catalog number, or the like; together with manufacturer's specifications, certified prints, and other data sufficient for making comparisons with items specified. When approved, such schedule shall be of equal force with these specifications in that no variation there from shall be allowed except with Architect's written
approval. Number of Shop Drawings and procedure shall be as directed by the Architect.

G. Architect and/or Engineer's approval of submittal data does not relieve the contractor of his responsibility to comply with the contract documents.

H. It is the responsibility of the Mechanical contractor to coordinate all Electrical requirements of the submitted equipment with the Electrical contractor. Any increase in cost due to a variance between the contract documents and the submitted equipment shall be the responsibility of the Mechanical Contractor.

I. All pressure vessels shall be constructed and tested in accordance with applicable ASME Codes and shall bear ASME stamps. Certificates of inspection and approval shall be submitted to Architect.

J. Similar items of equipment shall be the product of the same Manufacturer.

2.2 SHOP DRAWINGS:

A. Before starting work, submit and obtain approval of detailed drawings of the following, fully dimensioned (including elevations of ductwork and piping) and drawn not less than 1/4"= 1'-0" scale. Submit one (1) set of paper or mylar sepias.

1. Ductwork (do not scale diffuser locations, coordinate with ceiling grids and lighting layout). See Section 15860 "DUCT ACCESSORIES".

2. Plenum casings.

3. Complete mechanical equipment and fan room plans showing location of equipment, conduit stubs for motors, floor drains, and equipment pads and foundations.

4. Equipment piping.

B. Submit complete control and power wiring diagrams for approval before installing controls. See Section 15900 "CONTROLS".

2.3 RECORD DRAWINGS:

A. When work starts, obtain white prints of the HVAC Drawings. All corrections, variations, and deviations, including those required by change orders, if any, must be recorded in colored ink or colored pencil at the end of each working day on these drawings. The marked prints shall be available at all times for the Architect's inspection.

B. Prior to examining the request for final payment or making any response thereto, the Architect shall receive from the Contractor one (1) complete set of the white prints, marked as stated above, indicating the actual completed installation of the work included under this Contract.

C. The Architect will forward the marked white prints to the Consulting Engineers for review. They will then be returned by the Architect to the Contractor for use in preparing record drawings.

D. When work is completed Contractor shall purchase from the Architect (At Architects' printing cost) one (1) set of mylar reproducible prints of HVAC Drawings for use in preparing record drawings. Contractor shall transfer the information from the marked white prints to the mylar record drawings, removing all superseded data in order to show the actual completed conditions.
1. Accurately shown location, size and elevation of new exterior piping work and its relationship to any existing piping and utilities, obstructions, etc., contiguous to the area of work.

2. Block out areas modified by change-order and identify them by change-order number.

E. Ductwork and Control Drawings may be a set of mylar reproducible shop drawings, up-dated to show actual conditions at completion of work.

F. HVAC piping may be added to the ductwork shop drawings as noted in paragraph "E" above.

2.4 MOTORS, STARTERS AND ELECTRICAL EQUIPMENT:

A. Provide electrical equipment compatible with the current shown on electrical drawings. Verify current characteristics before ordering equipment.

B. Should the Contractor with the Architect's/Engineer's approval make changes in electrical equipment from those shown on the Electrical Drawings, he shall be responsible for the coordination and cost of required changes.

C. Provide factory installed fuses in all equipment requiring fusing for branch circuit protection.

D. Motors:

1. 1750 RPM open drip-proof construction unless otherwise shown or specified.
   Integral horsepower three phase motors shall be of premium energy-efficient design with apparent efficiency (power factor X efficiency) not less than ASHRAE 90.1.

2. All motors served by variable frequency drives (VFD's) shall be inverter duty rated.

3. Unless shown otherwise motors less than 1/2 HP shall be single phase, motors 1/2 HP and larger shall be three phase.


E. Do not run motors until correct overload elements are installed in starters. Trading overload elements for elements of correct size for motors actually furnished shall be included in this Section.

F. Starters shall be in motor control centers, furnished mounted on packaged equipment or furnished in this section and installed under "ELECTRICAL SECTION" as indicated and/or shown on the Electrical Drawings. All starters furnished with fused control circuit transformers.

G. Starters shall be equipped with melting alloy terminal overload protection, in a 3 phase. Starters, unless indicated otherwise, shall be across-the-line type with overload and low voltage protection. Starting equipment shall comply with local utility company requirements.

H. Starters to be Square "D", Allen-Bradley, Cutler-Hammer or approved equal.

I. For single phase motors provide manual starters equal to Square "D" Class 2510. When installed in
equipment rooms provide surface mounted enclosure, and when installed in finished walls outside
equipment rooms provide flush mounted enclosure, key operated.

J. Key operated manual starters with Flush enclosures, equal to Square "D" Class 2510.

K. Provide magnetic line voltage starters with NEMA I enclosures and melting alloy overload elements.

L. Provide non-fused combination magnetic line voltage starters with NEMA I enclosures and melting
   alloy overload protection.

M. Provide H-O-A switches, fused control circuit transformers, auxiliary contacts, etc., as shown on
   control diagrams or required by control sequences and/or arrange for these items to be furnished with
   the starters or motor control centers specified in Electrical Work.

N. All starters shall be by the same manufacturer.

O. Provide thermal overload with equipment for motors 1/2 HP and less at 120/1/60.

2.6 SLEEVES:

A. For pipe through floors inside rated chases or through non-fire-rated walls: 20 gauge galvanized steel,
   1/2" larger than pipe or covering.

B. For uninsulated pipe through fire rated walls or partitions or floors outside chases: Pipe Shields, Inc.,
   Model WFB or approved equal at walls, Model DFB at floors.

C. For insulated pipe passing through fire rated partitions or walls or floors outside chases: Pipe Shields,
   Inc., Model WFB-CS for hot lines, VFB-CS-CW for cold lines. Insulation: Calcium silicate for hot
   lines and foamglass for cold lines, thickness specified for adjacent pipe covering.

D. For pipe through concrete beams: Schedule 40 black steel pipe, 1/2" larger than pipe or covering.
   Pipe covering passing through sleeve: calcium silicate in a 24 gauge galvanized steel shield similar to
   Pipe Shields, Inc. thermal hanger shield. Caulk space between bare pipe insulation jacket and beam
   with fire retardant rope at both ends of the sleeve and seal with 3M Brand fire barrier caulk CD 25 or
   Putty 303, thickness and application in strict accord with manufacturer's recommendations, minimum
   thickness 1".

E. At Contractor's option, instead of the factory fabricated sleeves specified above for pipe passing
   through floors and fire rated walls and partitions substitute 20 gauge galvanized steel sleeve 1/2"
   larger in diameter than pipe or pipe covering and seal one end of sleeve (both ends if both ends are
   exposed) with 3M Branch Fire Barrier Caulk CP25 or Putty 303, thickness and application in strict
   accord with manufacturer's recommendations, minimum thickness 1". Where pipe is insulated,
   insulation shall be continuous thru sleeve, calcium silicate for hot lines and foamglass for cold lines. In
   exposed areas, after product has dried it shall be sanded smooth for painting under painting section.

F. Set sleeves before concrete is poured or masonry is erected. In existing construction, grout sleeves
   firmly in place.

G. Sleeves for ducts: See Fire Dampers (See Section 15860 "DUCT ACCESSORIES").

H. Extend sleeves 1-1/2" above finish floor and waterproof.
I. Where exposed ducts pass through walls and partitions, provide 4” wide 20 gauge galvanized steel closure plates except at grilles and registers. Fit closure plates snugly to duct and secure to wall. Grout around ducts and sound absorbers at equipment room walls.

J. Where exposed pipes pass through walls and partitions in finished spaces, provide chrome plated F & C plates or escutcheons.

2.7 ACCESS DOORS:

A. Doors in non-fire rated walls and ceilings: 17-gauge steel with hinges and screwdriver latches, Bilco, Milcor, Miami-Carey, or equal. Doors in fire rated walls and ceilings: UL labeled with fire rating equal to fire rating of wall or ceiling. Provide door styles compatible with adjoining surfaces as selected by Architect. Size doors to permit removal of equipment and/or maintenance, minimum size 18" X 18".

B. Mark lay-in ceilings with paper brads at maintenance access points. Bend ends of brads over above ceiling tile.

PART 3 - EXECUTION:

3.1 PROTECTION OF ROTATING PARTS:

A. Equip exposed belt drives with belt guards with holes for measuring speeds of driven shafts.

B. Provide exposed couplings with coupling guards.

C. Equip propeller fans with guards.

D. Equip inlets and outlets of open centrifugal fans with 1-1/2" #10 Diamond mesh galvanized steel screens.

E. All motors or other equipment exposed to weather shall be provided with weatherproof covers.

3.2 PROTECTION OF EQUIPMENT:

A. During construction, protect mechanical equipment from damage or deterioration.

B. When installation is complete, clean equipment and make ready for painting.

3.3 INSTALLATION OF EQUIPMENT:

A. Install equipment to provide normal service access to all components.

B. Provide sufficient space for removing components, install equipment to provide such clearance.

C. Install equipment in accordance with manufacturer's instructions. If manufacturer's instructions conflict with contract documents, obtain Architect's decision before proceeding.
D. All equipment shall be firmly fastened in place:

1. Roof curbs shall be secured to deck and structure and curb mounted items shall be secured to curbs.
2. Pad mounted equipment shall be secured to pads using poured in place anchor bolts or cinch anchors.
3. Vibration isolators shall be secured to floors, pads or structure and equipment shall be bolted to the isolators.

3.4 EQUIPMENT SUPPORTS:
A. Provide supports for ductwork, piping and equipment. Hot dip galvanize after fabrication all grillage, supports, etc., located outdoors.
B. Set all floor-mounted equipment, other than condensate pumps, on concrete pads or rails (as indicated of height shown, but not less than 4" high). Coordinate pad height with condensate drain trap requirements. Chamfer rails and pads 1”. Where shown, provide reinforced floating pads mounted on vibration isolators. Form, reinforce and pour any pads and rails required but not shown on Structural and Architectural Drawings.

3.5 CUTTING AND PATCHING:
A. Set sleeves and inserts and lay-out and form openings in walls, beams, girders and structural floors in this Section.
B. Cut, patch and repair as required to accomplish HVAC Work and finish to match adjacent work. Architect's approval required before cutting any part where strength or appearance of finished work is involved.

3.6 INCIDENTAL WORK:
A. Provide all motors incidental to the Mechanical Systems. Wiring of motors, switches and starters is included in "ELECTRICAL SECTIONS".
B. Do all control wiring required for Mechanical work.
C. Provide motor starters as specified above.
D. Submit refrigerant piping diagrams as prepared by the HVAC Contractor and/or refrigeration equipment manufacturer for approval.
E. Final water connections to services are included in this Section.
F. Permanent drain connections for AC units, etc., and auto air vents to nearest floor drain are included in this Section.
G. Door louvers are not included in this Section.
H. Items obviously omitted from drawings and/or specifications shall be called to attention of the Architect prior to submitting Bid, after award of Contract any changes or rearrangements necessary to complete Contract shall be at no additional cost to Owner.
I. All return air and exhaust air grilles shall be covered with filter media if they are started and operated during construction.

3.7 **FLASHING:**

A. General: Furnish all fans curbs, pitch cups, metal base flashing and counter flashing required for HVAC Work. Installation of above items is specified in "ROOFING SECTION" with coordination by HVAC Contractor.
B. Fan curbs for power roof ventilators are specified with the fans.
C. Pitch Cups: 20 gauge galvanized steel, at least 8" deep, bases mitered and soldered and extending at least 4" horizontally.
D. Metal Base Flashing: Galvanized steel for ferrous items, and stainless steel for stainless steel duct and aluminum for aluminum duct. Minimum thickness 22 gauge (0.034") galvanized steel, 20 gauge (0.038") stainless steel, 0.032" aluminum. Bases mitered and soldered extending out at least 4" horizontally and 8" vertically.
E. Metal Counter Flashing: Of material and gauges specified for base flashing, lapping base flashing at least 3".

3.8 **EXCAVATION AND BACKFILLING:**

A. Include all excavation and backfilling required to bring the work to line and grade shown, including excavation of rock and all other materials which may be encountered.
B. Excavate trenches wide enough for proper installation of work. Grade trench bottoms evenly. Provide bell holes as necessary to insure uniform bearing for pipes. Excavate minimum 6" below pipe. Refill cuts below required pipe grade with sand or compacted gravel. Support pipe continuously along its entire length. Do not use piers to support piping.
C. Backfill after inspection by Architect and authorities having jurisdiction. Backfill compacted areas with "Engineered Fill", sand or fine gravel in accordance with requirements of "Sitework". Backfill paved areas with sand or fine gravel compacted to meet requirements of Paving Section. Backfill shall be free of rock, wood, steel, brick, etc. Do not disturb pipe. Restore or repair pavements and the like after backfilling, matching adjacent work.

3.9 **HVAC INSTALLATION OF AND CONNECTIONS TO ITEMS FURNISHED BY OTHERS OR SPECIFIED IN OTHER SECTIONS:**

A. Duct Mounted Smoke Detectors: Install in duct.

3.10 **PAINTING:**

A. Refinish equipment damaged during construction to new condition.
B. Paint all non-potable water pipe and insulation yellow in accordance with Plumbing Code using paint
of type specified in Painting Section.

C. Paint un-insulated duct surfaces visible through grilles and registers flat black.

D. Other painting is specified in "PAINTING SECTION, Finishes Division".

3.11 PIPE IDENTIFICATIONS:

A. Identify all piping exposed to view or accessible through removable ceilings or access panels with plastic snap-on pipe line markers. Color code markers in accordance with ANSI A13.1. Show pipe contents and direction of flow. Markers on lines 8" OD and smaller shall be taped in place; on lines over 8" OD secure with spring clips.

B. Submit samples of all labels, tags, stencils, chains, etc., for approval.

C. Protect all factory identification tags, nameplates, model and serial numbers, stenciling, etc., during construction and replace if damaged.

D. Label Spacing and Extent:

1. On straight run of pipes; Above suspended ceilings space labels approximately 10 feet on center; elsewhere, 20 feet on center.

2. Wherever a pipe enters or leaves a room or building.

3. At change of direction.

4. At main valves and control valves (not equipment valves).

5. On risers, just above and below floors.

3.12 VALVE TAGS:

A. 2" X 3" laminated plastic with 1/2" numbers engraved at top indicating type service and valve number, leaving space for further engraving by others. Secure tags with chains to valve yoke or stem, not handles.

B. Valve tags colors: Brass tags with black numbers.

C. Valve tag locations: At all valves on mains, risers and branches.

D. Valve tag numbers: Starting with Number 1, number tags in sequence from the lowest point to the highest point in the building. In existing building extend existing sequences.

3.13 VALVE CHARTS:

A. In all mechanical rooms, provide charts showing number and locations of all valves, type of service, etc. Frame with aluminum, under glass.

B. In existing buildings include existing valves in the charts of new valves.

3.14 EQUIPMENT IDENTIFICATIONS:
A. Provide 2" X 3" or larger laminated plastic nameplates with 1/2" numbers and letters in colors specified below. Screw tags to equipment in obvious locations. Engrave equipment designation and numbers as shown on plans and drawings on upper half of tags, leaving lower half of tag for future engraving by Owner.

B. Provide similar nameplates for motor starters furnished under this section.

C. Secure nameplates with acorn head screws.

D. Colors:

1. Equipment connected to utility power only - black letters on white nameplates.

2. Equipment connected to emergency power - red letters on white nameplates.

E. In existing building replace all existing nameplates which do not comply with above colors.

3.15 **EXHAUST FAN IDENTIFICATIONS:**

A. 2" X 3" or larger laminated plastic nameplates with red letters and numbers on white background, identifying type of fans, number according to plans, and rooms served. Engrave on upper half of tag, leaving lower half for engraving by Owner. Fasten with acorn head screws.

3.16 **ACCESS DOORS:**

A. Provide access doors for valves, fire dampers, dampers, controls, air vents, and other items located above non-lift-out ceilings or behind partitions or walls.

3.17 **WARRANTY AND INSTRUCTIONS:**

A. See General Conditions - One-Year Warranty.

B. Contractor shall and hereby does warrant all materials, workmanship and equipment furnished and installed by him to be free from defects for a period of one (1) year after date of substantial completion of the Contract. Should any defects in materials, workmanship, or equipment be made known to Contractor within the one (1) year warranty period, Contractor shall replace such materials, workmanship, or equipment without charge.

C. All centrifugal, reciprocating, screw or scroll type refrigeration compressors shall bear five (5) year non-pro-rated parts warranty.

D. All gas fired air furnaces shall bear ten (10) year prorated heat exchanger warranties.

E. After completion of the work, Contractor shall operate the equipment which he installs for a period of ten (10) working days, as a test of satisfactory operating conditions. During this time, Contractor shall instruct the Owner's operating personnel in the correct operation of the equipment. Furnish necessary oral and written operating instructions to the Owner's representative.

F. Provide five (5) sets of manufacturer's operating and maintenance manuals and parts lists including
nearest manufacturer's sales and service representative by name, address and phone for all equipment and materials furnished. Provide a maintenance schedule listing routine maintenance operations and suggested frequency. Include all warranty dates on equipment and guarantees. Include names, address and phone of any subcontractor and work performed. Bind above items in loose leaf three (3) ring binders with tab for each class of equipment.

G. During the period of tests, adjust all controls, regulators, etc., to comply with these Specifications.

H. Supply initial charges of refrigerant, refrigeration lubricating oil; and anti-freeze necessary for the correct operation of the equipment. Maintain these charges during the guarantee period, with no additional cost to the Owner, unless loss of charge is the fault of the Owner.

I. Make available to the Owner, without additional cost, service and adjustment of the equipment for the guarantee period.

1. Service shall include:
   a. On call nuisance issues.
   b. Replenishing refrigerant and antifreeze if loss occurs due to system failure.

2. Service shall not include:
   a. Routine maintenance of the equipment unless specified in specific equipment specification section(s).

3.18 PROJECT CLOSE-OUT DOCUMENTS:

A. Prior to the issuance of a certificate for final payment, submit to Architect and obtain his approval of the following:

1. A letter signed by the subcontractors for HVAC, Electrical, and Temperature Control work stating that they have jointly checked each power circuit and control circuit and mutually agrees that controls and power circuits will function properly.

2. Record drawings - sheet metal work (reproducible).

3. Record drawings - piping (reproducible).

4. Record drawings - control systems (reproducible).

5. Control manufacturer's letter of certification (3).

6. Air balance report (3).

7. Equipment Submittal Data (3).

8. Equipment operating and maintenance manuals (3).

9. Maintenance schedule (3).
10. Equipment warranty dates and guarantees (3).

11. List of Owner's Personnel who have received maintenance instructions.

END OF SECTION 15010
SECTION 15020

TESTING, BALANCING AND ADJUSTING (TBA)

PART 1 - GENERAL:

1.1 SCOPE:
    A. Provisions of this section apply to all HVAC work.
    B. All tests shall be witnessed by the Architect in addition to authorities having jurisdiction. A minimum of 48 hour notice is required prior to performance of test.
    C. Provide complete report to Engineer for approval TEN (10) working days prior to Engineer=s final site visit.

1.2 QUALIFICATIONS:
    A. All TBA work shall be performed by an independent Test and Balance Agency specializing in Testing, Balancing and Adjusting of HVAC Systems.
    B. All TBA work shall be under supervision of a qualified registered professional engineer regularly engaged in the TBA Agency.
    C. TBA Agency shall be an AABC or NEEB Member and/or shall obtain written approval from the Architect prior to Bidding.

1.3 APPROVAL:
    A. Application for approval of the TBA agency shall be submitted prior to Bid.
    B. Submittal information regarding the TBA agency to include:
       1. List of at least five (5) projects successfully completed of similar size and scope.
       2. Copy of reporting forms to be used for this project indicating scope of TBA work.
       3. Name of registered engineer in charge with resume of qualifications. List of personnel that will perform TBA work on project and qualifications.
       4. List of instruments to be used with dates of latest calibrations.
       5. List of memberships in AABC, NEBB or other similar organizations.

PART 2 - PRODUCTS:

2.1 INSTRUMENTS:
    A. All instruments used for the TBA work shall be calibrated within six (6) months and checked for accuracy prior to start of work.
PART 3 - EXECUTION:

3.1 GENERAL REQUIREMENTS:

A. Prior to any work beginning perform, a pre-demolition test of all existing systems being affected by the renovation and/or the addition. Submit Test and Deficiency List as indicated below.

B. After HVAC system has been installed, Test, Balance and Adjust System for proper operation, air distribution, flow rates, temperatures and humidities. Correct any noise and/or vibration conditions.

C. Include a "Deficiency List" with the TBA air and water balance report. Deficiency list shall include TBA items which are not in accordance with Contract Documents.

D. Perform all tests as required by local codes. Contractor shall furnish testing equipment.

E. If local Codes are more stringent, local Codes shall govern.

3.2 AIR SYSTEM:

A. When system has been completed, remove all trash and dirt, set grille bars and diffuser patterns for required throws and adjust and balance air duct systems so air quantities at outlets are as directed and distribution from each supply outlet is free from drafts and excessive noise, and uniform over the face of each outlet. Do all testing and balancing with filters blanked to provide pressure drops midway between clean condition and manufacturer's recommended change-out condition. Balance air quantities to within $\pm 5\%$ of indicated air quantities.

B. Make adjustments so dampers and volume adjusters close to air outlets will have the least pressure drop consistent with volume requirements. Obtain additional pressure drop required for balancing of shorter runs by adjusting dampers at branch duct take-offs. Adjustable fan drives shall be used for making final adjustments of total air quantities. Change sheaves on drives larger than 15 HP. Provide additional sheaves as required.

C. Direct reading velocity meters may be used for comparative adjustment of individual outlets, but measure air quantities in ducts having velocities of 1000 feet per minute or more with pitot tubes. Cap pitot tube openings in low pressure ducts with plastic plugs. Cap pitot tube openings in medium and high pressure ducts and kitchen and laboratory exhaust ducts with Duro-Dyne test ports.

D. Permanently mark settings of dampers and other volume adjusting devices so they can be restored if disturbed.

E. When air balancing has been completed, submit to Architect an air balance log, including design and actual air quantities, pressures, etc., in each branch duct and at each grille, register, and outlet. Individual outlet air rates are required for boots on boot-box systems.

F. Include for each system the following information:

1. Fan rpm, motor amps, motor nameplate amps, and amp rating of starter heater.

2. Total air quantity supplied by each system and/or fan.

3. Total outside air quantity supplied by each system.
4. Provide velocity pressure across each duct mounted smoke detector and list manufacturer's required velocity pressure range.

5. Air flow at all grilles.

6. Static pressure profile thru each air handler.

3.3 COILS:

A. Provide the following:

1. Entering and leaving air temperatures during heating and cooling cycles. For hot gas reheat coils provide leaving air temperatures during reheat cycle.

2. Outside air temperature at time of test.

3. Air pressure drop.

3.4 START-UP AND SERVICE:

A. At the beginning of the first heating season, adjust and balance operating phases and repeat at the beginning of the first cooling season or vice-versa, as the case may be, all without charge.

B. The Contractor and Factory Representative of the boilers, chillers, AC units and major HVAC equipment shall place every item of such equipment into satisfactory operation with all automatic and safety devices. Further, all adjustment service required shall be performed during the warranty period. Adjustment services does not include lubricating fans or motors and does not include changing filters or adjusting belts.

C. In addition, submit equipment manufacturers' start-up reports for items listed above. See "Project Close-Out".

END OF TESTING BALANCING AND ADJUSTING (TBA)
PART 1 - GENERAL:

1.1 SCOPE:

A. Include Section 15010, "GENERAL PROVISIONS - HVAC", with this Section.

PART 2 - PRODUCTS:

2.1 MATERIALS:

A. All pipe, fittings and valves shall be manufactured in the United States of America.

2.2 NON-POTABLE WATER PIPING:

A. Type "L" hard copper with wrought copper sweat fittings made with 95-5 solder. Provide dielectric unions between ferrous and non-ferrous metals.

2.3 HVAC DRAIN PIPING:

A. Standard weight galvanized steel pipe ASTM A-120 with galvanized malleable iron fittings, or type "L" hard copper with wrought copper sweat fittings or Schedule 40 PVC, at Contractor's option.

B. Provide rubber drain traps for roof mounted AC Units. Trim traps so units will drain under operating conditions. Extend PVC drain piping to nearest roof drain or gutter.

C. Provide drain traps for AC Unit drain pans. Size traps as required to drain under operating conditions.

2.6 VIBRATION ISOLATION:

A. General: Mount all piping and rotating equipment using vibration isolators as specified below. Amber Booth, Korfund, Mason Industries, Peabody, Vibration Eliminator Co., or VMC. Mason Industries part numbers are given for reference. Minimum 95% isolation efficiency.

B. Isolators for Floor-Mounted Equipment: Laterally stable free-standing unhoused spring isolators with steel base plates, ribbed neoprene acoustical pads and leveling bolts, #SFL. Static deflections: as required to provide 95% isolation efficiency.

1. Mount items noted or shown on concrete inertia bases and mount the inertia bases on the isolators specified above.

C. Isolators for Suspended Equipment: Combination steel spring and rubber in shear isolators, #30N. Static deflections: As required to provide 95% isolation efficiency or 1" static deflection, whichever is greater. Provide isolators for all suspended rotating equipment.

D. Mount air handling unit sections in contact with concrete pad on single layer of ribbed neoprene on top of housekeeping pads as shown. Neoprene vibration pad shall cover the entire surface of the unit in contact with the concrete pad.
E. Provide snubbing isolators, similar to those specified above for pipe hangers for flexible connections at fans.

F. Isolation Curbs: Provide spring isolation curbs to match units and roof slope. Springs shall have a minimum of a 2" deflection range.

PART 3 - EXECUTION:

3.1 PIPE INSTALLATION:
A. Pitch air conditioning unit drain lines down in direction of flow 1” in 20'.

3.2 INSTALLATION OF VALVES:
A. Provide shut-off valves in supply and return to each item of equipment. Locate valves to isolate each item to facilitate maintenance and/or removal.
B. Provide check valve in discharge line adjacent to each pump.
C. Locate valves in piping connections to boilers, heat exchangers, water heaters, refrigeration machine, etc., so heads and tube bundles can be removed without disconnecting equipment or piping other than union or flange connections immediately adjacent to heat exchangers.
D. Provide seat to screw adapters where required.

3.3 REFRIGERATION SYSTEM:
A. Split Systems: When system is complete, but before the pipe covering has been installed, test components with dry nitrogen and make tight at equipment manufacturer's recommended test pressures. Then evacuate the system to 26" Hg. vacuum which the system shall hold for 24 hours. After passing the above tests, charge and leak test under operating conditions using electronic leak detector.
B. Split and Packaged Systems: Check operation of refrigeration cycle and report head pressure, suction pressure and oil pressure.

END OF SECTION MATERIALS AND METHODS - HVAC
SECTION 15180

INSULATION - HVAC

PART 1 - GENERAL:

1.1 SCOPE:

A. Include Section 15010 "GENERAL PROVISIONS - HVAC", with this Section.
B. Repair existing insulation at points of connection to existing work.
C. "Exposed" is defined as: Exposed to view when construction is complete. Items which are not "exposed" are "concealed".
D. "Attic" is defined as any ceiling space that is adjacent to the roof.
E. Insulate all items subject to sweating or loss of heat.
F. All insulation shall be installed by licensed applicator and applied in accordance with the Manufacturer's Recommendations.

1.2 INSULATION REQUIREMENTS:

A. Comply with NFPA 90A.
B. Pipe hanger shields are specified in Section 15050 "MATERIALS AND METHODS - HVAC".
C. Use insulation and adhesives with Underwriter's Laboratories flame spread rating not over 25 without evidence of continued progressive combustion, and smoke developed rating not exceeding 50 for all other pipe, duct and equipment insulation.

PART 2 - PRODUCTS:

2.1 FOAM PLASTIC PIPE COVERING:

A. Fire retardant foamed plastic pipe covering, maximum K factory at 75°F mean temperature not exceeding 0.27 BTU/(hr) (sq. ft.) (°F/in). Armstrong "Armaflex II", or approved equal.
B. Pipe covering may be seamless insulation slipped over piping before erection or may be slit longitudinally and installed over erected piping.
C. Make fitting covers from segments of pipe covering.
D. Cement all joints and seams in accordance with manufacturer's instruction using Armstrong 520 adhesive.
E. Fit pipe hangers over insulation (See PIPE HANGERS). Use hanger shields as specified under pipe hangers.
F. Thermal Performance:
1. 1” thick: R=4.2.
2. 2” thick: R=8.0.

2.2 **ALUMINUM JACKET PIPING COVER:**

A. 0.010” thick corrugated aluminum jacket with laminated polyethylene and draft paper adhered liner.

B. Securely rivet jacket in place and band with flat aluminum bands 18” o.c.

C. Finish fittings on aluminum jacketed lines with 1/8” thick (dry) coat of vinyl acrylic mastic reinforced with glass cloth.

2.3 **DUCT INSULATION, INTERNAL:**

A. Glass fiber acoustical/thermal insulation complying with NFPA 90A and UL 181 and having an erosion resistant anti-microbial membrane equal to Johns Manville, Linacoustic $\text{ARC}^\circledR$ on the air side. Edge coating shall be factory applied to the edges of the liner core. Shop fabrication cuts and field cuts or tears shall be coated with Superseal Duct Butter. NRC (1” thick) not less than 0.70, minimum density 3 lb/cu. ft., and maximum friction correction factor at 2000 fpm average velocity 1.15 (per TIMA test method AHS-1S2-76U).

B. Thermal Performance:

1. 1” thick: R=4.2.
2. 1 ½” thick: R=6.3.
3. 2” thick: R=8.0.

2.4 **DUCT INSULATION, EXTERNAL FOR CONCEALED:**

A. Formaldehyde free flexible glass fiber insulation with foil-scrim-craft (FSK) facing equal to Johnson Manville Micro-Lite $\text{AXG}^\circledR$. Flame spread classification, 25 or less, smoke developed rating not exceeding 50. Minimum density, 3/4 lb./cu. ft., 2.3” thickness, installed R=6.5 minimum.

**PART 3 - EXECUTION:**

3.1 **HVAC PIPING INSULATION:**


3.2 **AIR TERMINAL DEVICES:**

A. Ceiling Mounted Supply Diffusers: 2.3” thick (or 3” thick if in Attic) duct insulation on back of diffuser, external for concealed.

B. Fire Dampers for Internally Lined Ducts and Externally Insulated Ducts: 2.3” thick (or 3” thick if in Attic) duct insulation on all sides, external for concealed.
3.3 **DUCT INSULATION INTERNAL (AND EXTERNAL WHERE INDICATED):**

A. Apply in accordance with SMACNA "Duct Liner Application Standard" over full coverage adhesive. Coat all edges with adhesive and seal all punctures or tears with mastic before installing ducts. Cut liner to assure overlapped and compressed longitudinal corner joints. Fasteners shall be sized appropriately for thickness of liner utilized. Provide mechanical fasteners and metal nosings as noted below:

1. For all velocities, provide metal nosings on upstream edge of liner at connections to equipment: Fans, coils, dampers, AC Units, sound absorbers, etc.

2. For velocities up to 2,000 feet per minute: Start fasteners within 3" of the upstream transverse edges of the liner and 3" from the longitudinal joints and space them a maximum of 12"o.c. around the perimeter of the duct, except that they may be a maximum of 12" from a corner break. Elsewhere locate fasteners a maximum of 18" o.c., except that they shall be placed not more than 6" from a longitudinal joint of the liner nor more than 12" from a corner break.

3. For velocities from 2,001 to 4,000 feet per minute: Start fasteners within 3" of the upstream transverse edges of the liner and 3" from the longitudinal joints and space them a maximum of 6" o.c. around the perimeter of the duct, except that they may be a maximum of 6" from a corner break. Elsewhere locate fasteners a maximum of 16" o.c., except that they shall be placed not more than 6" from a longitudinal joint of the liner nor more than 12" from a corner break. In addition to the adhesive edge coating of transverse joints, coat and longitudinal joints with adhesive.

4. For velocities from 4,001 to 6,000 feet per minute: Same as 2 above except that metal nosing shall be installed to secure liner at all upstream transverse edges.

5. Duct size shown (except for round or flat oval ducts) includes allowance for insulation.

6. Where ducts are listed to be lined and wrapped, install wrap per section below "Duct Insulation, External, for Concealed Ducts"

B. **Thickness and Extent (all exposed round and rectangular duct):**

1. Rectangular Return Duct: 1" thick

3.4 **DUCT INSULATION, EXTERNAL, FOR CONCEALED DUCTS:**

A. Adhere insulation to duct surface with approved adhesive applied in strips above 6" wide on approximately 12" centers. Flare door staples may be used for securing the insulation until the adhesive sets. Lap jacket and vapor seal all joints and seams with suitable mastic.

B. On rectangular and flat oval ducts 30" wide and wider, additionally support insulation with weld pins and speed clips 18" on centers. Seal weld pins with mastic and FSK tape.

C. **Thickness and Extent:**

1. Supply duct not specified to be lined: 2.3" thick.
2. Exhaust duct not specified to be lined.

NOTE: Conical and straight spin-ins on both lined and unlined ducts shall be insulated. Insulation shall be slit at damper rods, at spin-ins and sealed vapor tight.

3.5 **INSULATION, FOR FAN CASINGS:**

A. Externally Insulate Fan Casings with 1" thick foamed plastic insulation cemented in place with adhesive in accordance with insulation manufacturer's instructions.

3.6 **PLENUM OR CASING INSULATION:**

A. As specified for duct insulation, internal.

B. Install using full coverage adhesive, and weld pins located 16" o.c. Install 1/4" #16 galvanized steel hardware cloth on air side and cut weld pins off flush inside casing.

C. For portions of casing downstream from final filters provide pre-sized woven fiberglass cloth facing between insulation and hardware cloth.

D. Provide 24 gauge galvanized steel nosings for insulation at access doors, duct connections and bottom corners of casing.

E. Pan floors of after filter plenums with 24 gauge galvanized steel.

3.7 **INSULATION WETTED DURING CONSTRUCTION:**

A. Contractor shall replace any and all insulation wetted during construction at his own expense.

**END OF SECTION INSULATION - HVAC**
SECTION 15820
FANS - HVAC

PART 1 - GENERAL:

1.1  SCOPE:

A. Provisions of this Section shall apply to all HVAC work.

PART 2 - PRODUCTS:

2.1  FANS, CENTRIFUGAL - GENERAL:

A. Fan Rating: Certified in accordance with AMCA Standard 210 for capacity and sound. Provide fans of class required for service based on static pressures 20% greater than those scheduled. All fans are to be rated for continuous duty.

B. Provide forward curved blade, radial blade, backward curved blade or air foil blade fans statically and dynamically balanced with L (10) 80,000 hour rated self-aligning, grease lubricated ball or roller bearings rigidly supported by bearing stands.

C. For all fans furnish adjustable motor bases or rails.

D. Size V-belt drives for 50% overload, and provide adjustable pitch motor pulleys for drives of 15 BHP and smaller.

E. For all fans outside casings provide belt and drive guards.

F. Provide scroll access doors with quick-operating latches for all exhaust fans.

G. Equip all fans with flanged outlets and casing drains.

H. Sound power levels shall not exceed those shown.

I. Size fan motors to provide at least 5% drive loss, with motor service factors not exceeding 1.0. Provide high efficiency motors as specified under "MOTORS".

J. Where scheduled provide variable inlet vanes with rods extended for connection to control operators.

K. Where scheduled provide corrosion resistant coating consisting of two (2) coats of chlorinated rubber base paint on all parts in airstream.

L. Where shown on electrical drawings provide two (2) speed separate winding motors (1800/900 rpm).

M. Where shown on electrical drawings provide motors suitable for two (2) step increment starting.

N. Vibration isolators: See "MATERIALS AND METHODS" Section 15050.

O. All roof and wall mounted fans are to be factory painted, color by Architect.
P. Fans shall be manufactured by Trane, Carrier, Cook, Greenheck, Breidert or approved equal.

2.2 FANS, CENTRIFUGAL ROOF EXHAUST:

A. Centrifugal power roof ventilators with AMCA certified air and sound ratings, belt or direct driven as shown. Provide permanently oiled bearings, statically and dynamically balanced backward curved blade wheels and spun aluminum housing with curb cap, disconnect switches, back-draft damper and outlet birdscreen. For belt driven fans provide V-belt drive sized for 50% overload, adjustable pitch motor pulley and adjustable motor base. For each fan furnish an 18 gauge galvanized steel insulated prefabricated curb with integral cant. Furnish baffled sound absorbing curbs where required to obtain noise level specified. Static pressure scheduled are external to sound curbs.

B. For kitchen range hood furnish up-blast discharge fan without sound curb, UL-762 labeled for grease laden air and fan wheels are to be Teflon coated. Fan shall be hinged onto curb for access to cleaning the fan.

C. All roof mounted fans to be factory painted to match louvers, color by Architect

2.3 FANS, CENTRIFUGAL CEILING EXHAUST:

A. AMCA rated direct drive centrifugal fans for ceiling mounting, complete with removable ceiling grille, disconnect, fan mounted solid state speed control, flexible duct connection, integral backdraft damper and discharge outlet. Maximum noise level: 4 sones.

PART 3 - EXECUTION:

3.1 INSTALLATION:

A. Fans shall be installed in accordance with manufacturer’s recommendations.

B. See details for mounting instructions and accessories.

END OF FANS - HVAC
SECTION 15840

DUCTWORK - HVAC

PART 1 - GENERAL:

1.1 SCOPE:

A. Include Section 15010, "GENERAL PROVISIONS - HVAC", with this section.

B. Provisions of this Section shall apply to all HVAC work.

1.2 SHOP DRAWINGS:

A. Ductwork shop drawings shall include details of duct constructions: seams, joints, gauges, reinforcing and hanger details for each pressure class and size range together with details of turning vanes, branch connections, dampers and access doors and elevations of all ductwork.

PART 2 - PRODUCTS:

2.1 DUCTWORK - GENERAL:

A. Unless otherwise shown or specified construct ducts of galvanized steel sheet metal using gauges and recommended details as contained in the current edition of the SMACNA HVAC Duct Construction Standards. Ductwork shall include supply air, exhaust air, return air, and outdoor air ducts, together with all necessary fittings, splitters, dampers, quadrants, flexible connections, sleeves, hangers, support, braces, etc. Hang and install ducts in a neat and workmanlike manner from structural members (not roof deck) with adequate bracing and cross breaking to prevent breathing, rattling, and vibration.

B. No flexible ductwork on return, exhaust or outside air.

C. Install Duro-Dyn locking quadrants and Duro-Dyne end bearings on all splitters and manual volume dampers located above accessible ceiling and Young #1 regulator, C.P., and Duro-Dyne end bearings elsewhere.

D. Duct dimensions shown include allowance for internal insulation where required.

E. Duct Turns: Wherever possible, duct turns shall have a centerline radius equal to 1.5 times the duct width in the plane of the turn. Vane other duct turns to provide a dynamic loss co-efficient ("C") not greater than 0.2. No reducing ells or tees to be used.

F. Duct Sealing: Seal duct seams and joints as noted below. Seal entire circumference of all branch duct connections, tapping collars and spin-ins. Seal ducts using mastic sealant equal to United Duct Sealer.

1. Class "A" Seal: Seal all joints and seams and leak test as specified.
2. Class "B" Seal: Seal entire circumference of all transverse joints, seal all longitudinal joints.
3. Class "C" Seal: Seal entire circumference of all transverse joints.

4. Class "D" Seal: Seal corner of transverse joints.

2.2 **DUCTWORK - LOW PRESSURE:**

A. Ductwork: Low Pressure, Pressure and Seal Class shall include: All supply, return, exhaust and outside air duct, 2" pressure class "B" seal.

B. Construct ducts in accordance with SMACNA Duct Construction Standards for pressure and seal classes noted.

C. All exposed duct shall have paint grip finish. Color by Architect.

2.3 **FLEXIBLE DUCTS:**

A. Flexible duct connectors: A two (2) element spiral construction composed of galvanized steel supporting spiral and coated woven textile fabric with metal or mineral base, UL listed as Class I Air Duct and Connector (UL 181) minimum R=6.0.

B. Flexible connectors shall not exceed 5 feet in length.

C. Make connections between flexible ducts and other equipment using galvanized steel draw bands with plated screws and buckles and United Duct seal for high and medium pressure ducts and nylon draw bands for low pressure ducts.

D. Factory insulate cold flexible ducts using insulation equivalent to that specified for cold ducts.

E. Flexible ducts: Thermoflex M-KC, Wiremold 57K, Technaflex 57K, or Flexmaster Type 4M. Submit sample for approval of any other manufacturer.

**PART 3 - EXECUTION:**

3.1 **INSTALLATION:**

A. Ductwork shall be installed in accordance with manufacturer's recommendations.

B. All ductwork shall be ran as high as practical and not on the floor unless otherwise indicated.

C. See details for mounting instructions and accessories.

**END OF DUCTWORK - HVAC**
SECTION 15860

DUCT ACCESSORIES - HVAC

PART 1 - GENERAL:

1.1 SCOPE:

A. Provisions of this Section shall apply to all HVAC work.

PART 2 - PRODUCTS:

2.1 SHEET METAL SPECIALTIES:

A. Make rectangular take-offs in low pressure supply, return and exhaust ducts using 45 degrees entry tap (SMACNA Duct Construction Standards Figure #2-8) with manual damper with end bearings and locking quadrant in branch. End bearings and quadrants shall have air tight duct connections and shaft seals: Ruskin, Duro-Dyne, or approved equal.

B. Manual balancing dampers: Comply with SMACNA Duct Construction Standards, Figure 2-14 and 2-15. Equip all dampers with locking quadrants and end bearings. End bearings and quadrants shall have air tight duct connections and shaft seal, Ruskin, Duro-Dyne, or approved equal.

C. When damper quadrants are located other than above lay-in ceilings.
   1. Provide all necessary accessories for remote control of balancing dampers without requiring access doors. Substitute Young #1 regulators and an additional end bearing or Ventlock #688 regulators and an additional end bearing for the quadrant (regulators shall be chrome plated), or, Architect/Engineer option........
   2. Provide access door for access to the quadrant (See sub-section 2.05 "ACCESS DOORS", hereinafter).

D. Provide "Stand-Offs" (hat sections) for damper quadrants, controls, etc., on externally insulated ducts.

E. Branch duct connections for connecting round low pressure branches to rectangular low pressure trunks: Conical take-off spin-in fittings with integral dampers with end bearings, stand-off and beaded collars. Seal Class of components penetrating duct shall be consistent with duct pressure class. Spin-in shall be Flexmaster - CBD. Submit sample for approval of other manufacturers for prior approval.

2.2 FIRE DAMPERS:

A. Install UL labeled 1-1/2 hour fire dampers wherever sheet metal ducts pass through chase walls, floors, outside fire chases, and elsewhere as shown or required by local Code. Install dampers per SMACNA "Fire Damper Guide" and UL 555.

   1. Fire dampers shall be Type "B" "Venation Blind" dampers. Unless otherwise shown folded blades shall not obstruct duct. Dampers in floors shall be spring loaded.
2. Provide factory fabricated steel integral wall/floor sleeve 3” longer than wall thickness for each fire damper and install sleeve using bolts and angles as detailed in Figure #1 of SMACNA "Fire Damper Guide".

3. Provide rectangular, round and/or flat-oval collars. See Drawings for sizes and locations.

4. For aluminum ductwork provide stainless steel fire dampers.

B. Install ceiling fire dampers in all fire rated ceiling as shown in Figure #11 of SMACNA "Fire Damper Guide" at ceiling penetrations as noted. Fire rated diffuser assembly to be approved for the specific UL Classification of the ceiling assembly used.

C. Install access door in low pressure ducts at each fire damper. Install wall or ceiling access door for access to fire dampers not accessible through lift-out ceilings. See sub-section 2.05 "ACCESS DOORS", below.

D. Install three (3) hour fire dampers where sheet metal ducts pierce 4 hour fire walls. Three (3) hour fire damper shall consist of a three (3) hour UL labeled fire door pivoted in a 3" X 3" X 1/4" angle frame bolted through wall. Equip door frame with angle flange and latch. Install Fire Door as shown in Figure 25 and 26 of SMACNA "Fire Damper Guide".

2.3 AUTOMATIC DAMPERS:

A. Factory fabricated dampers with extruded aluminum blades and frame with full gasket stops for blades ends. Equip blades with air tight plastic or butyl rubber seals and bronze or nylon bearings. Ruskin Model CD50.

B. Automatic dampers located near fan outlets or in ducts having maximum velocities exceeding 1500 FPM shall have extruded aluminum air-foil blades and all linkages shall be located outside of airstream. Such dampers shall have leakage rates not exceeding 1% maximum design flow at 4” WG pressure differential.

2.4 SMOKE DETECTORS:

A. Smoke detectors shall be ionization detectors which detect product of combustion. Furnish, wire, and install smoke detectors under this Section. Provide smoke detectors compatible with fire alarm system specified under Electrical Work and equip them with contacts for connection to Fire Alarm System. (See sub-section 15901 "CONTROLS", hereinafter). Provide remote visual/audio indicator mounted on the ceiling near the detector.

B. Smoke detectors will be furnished and wired under Electrical Work but shall be installed in ducts under this Section.

C. Locate smoke detectors so that indicating lights are visible and so that they will not be affected by moisture from coils or humidifiers.

D. Install access door in duct at each smoke detector. (See sub-section 2.5 "ACCESS DOORS", hereinafter).

2.5 ACCESS DOORS:
A. Access doors in plenum casings are specified under "DUCTWORK - PLENUM CASINGS".

B. Access doors in low pressure ducts: Galvanized steel frame with gasket permanently secured to duct with a removable gasket access port held in place with screw driver or thumb operated latches. Door in insulated ducts: Double thickness with insulation. Doors in non-insulated ducts: A single thickness. Weld door frames to kitchen exhaust ducts. Size doors to permit removal of equipment or maintenance. Minimum size 12" X 12".

C. Mark access points in lift-out ceilings with brass paper brads. Bend points of brads over top of ceiling.

2.6 **FLEXIBLE DUCT CONNECTIONS:**

A. Install Neoprene coated glass cloth flexible connections at all duct connections to all fans and AC Units.

B. Install flexible connections in all ducts at building expansion joints.

2.7 **ELECTRICAL GROUNDING:**

A. Ground all fans.

B. Install braided copper jumpers around all flexible connections, taking care that jumpers do not bind flexes.

2.8 **INTAKE AND RELIEF HOOD:**

A. Gravity roof ventilators shall be constructed of heavy gauge aluminum as specified.

B. Hoods shall be constructed of precision formed, arched panels with interlocking seams.

C. Bases shall be constructed so that the curb cap in 8" larger than the throat size. Provide 12" bases.

D. Hood support members shall be constructed of galvanized steel and fastened so that the hood can be either removed completely from the base or hinged open.

E. Birdscreens constructed of 1/2" galvanized steel mesh shall be mounted horizontally across the intake/discharge area of the hood.

F. Intake units with throat widths through 42" shall ship assembled when throat lengths do not exceed 84". Relief units with throat widths through 48" shall ship assembled when throat lengths do not exceed 96".

G. Units shall be factory painted (submit color to Architect).

H. Gravity hoods shall be Fabra Hood Model FHI for intake or Model FHR for relief (as specified) as manufactured by Greenheck.

**PART 3 - EXECUTION:**

3.1 **INSTALLATION:**
A. Duct shall be installed in accordance with SMACNA Standards.

B. Equipment shall be installed in accordance with manufacturer's recommendations.

C. See details for mounting instructions and accessories.

END OF DUCT ACCESSORIES - HVAC
SECTION 15870

OUTLETS

PART 1 - GENERAL:

1.1 SCOPE:

A. Include section 15010 "GENERAL PROVISIONS" with this section.

B. Provisions of this Section shall apply to all HVAC work.

PART 2 - PRODUCTS:

2.1 GRILLES, REGISTERS AND DIFFUSERS:

A. General: Air devices may be Titus, Price, Metal Aire, Krueger, Tuttle & Bailey or approved equal. Where fire dampers are required at grilles, provide steel grilles, not aluminum.

B. Supply Registers (SR): Adjustable vertical deflection, adjustable horizontal deflection, removable core, opposed blade damper and multi-blade scoop and baked aluminum enamel finish. Titus "1700".

C. Wall Return Grilles (WRG): Horizontal bars fixed at about 15° angle, close spacing and plaster frames. Baked aluminum, enamel finish. Titus "1700".

D. Bar Return Grille (BRG): All steel, heavy duty, 16 gauge border, 14 gauge blades, 1/2" spacing, 38° deflection. Provide all frames. Titus "33R".

E. Ceiling Return Grilles (CRG), Ceiling Exhaust Grilles (CEG) and Transfer Air Grilles (TAG): All aluminum, 1/2" X 1/2" X 1/2" cube core and plaster frames as needed. Off-white baked enamel finish. Provide 24 x 24 panel so grille will fit in 24 x 24 ceiling grid. Titus "50F".

F. Architectural Supply Diffuser (ASD): The diffuser shall have an 18 gauge steel face panel, which shall be a one piece assembly, removable by means of four positive locking posts. The exposed surface of the face panel shall be smooth, flat, and free of visible fasteners. The face panel shall project 1/4" below the outside border of the diffuser back pan. The back of the face panel shall have an aerodynamically shaped, rolled edge to ensure a tight horizontal discharge pattern. The back pan shall be one piece precision die-stamped and shall include an integrally drawn inlet. The diffuser back pan shall be constructed of 22 gauge steel. The finish shall be #26 white. The pencil hardness must be HB to H. Provide round damper constructed of heavy gauge steel. Damper must be operable from the face of the diffuser. Option AL downblow clips shall be provided to restrict the discharge air in certain directions. The manufacturer shall provide published performance data for the square panel diffuser. The diffuser shall be tested in accordance with ANSI/ASHRAE Standard 70-1991. Diffuser shall be Titus "OMNI".

PART 3 - EXECUTION:

3.1 INSTALLATION:

A. Equipment shall be installed in accordance with SMACNA Standards and manufacturer's
recommendations.

B. See details for mounting instructions and accessories.

END OF OUTLETS
SECTION 15880

FILTERS - HVAC

PART 1 - GENERAL:

1.1 SCOPE:

A. Provisions of this Section shall apply to all HVAC work.

PART 2 - PRODUCTS:

2.1 FILTERS - AIR:

A. 30% filters, 1" or 2" thick (Maximum allowed by MFR): Throwaway deep pleated filters, maximum face velocity 350 fpm. Maximum initial pressure drop 0.1" WG, UL Class 1, 30% efficiency per ASHRAE Test Standard 52-76, minimum ratio of media area to face area 4.4:1. Turn system over to Owner with clean filters and provide one (1) set of spare filters. Farr 30/30 or approved equal.

PART 3 - EXECUTION:

3.1 INSTALLATION:

A. Filters shall be installed in accordance with manufacturer's recommendations.

B. See details for mounting instructions and accessories.

END OF FILTERS - HVAC
SECTION 15900

CONTROLS - HVAC

PART 1 - GENERAL:

1.1 SCOPE:

A. Include Section 15010 "GENERAL PROVISIONS", with this Section.

B. Provisions of this Section shall apply to all HVAC work.

PART 2 - PRODUCTS:

2.1 CONTROL SYSTEMS:

A. Furnish and install complete and ready for operation with control sequences specified below.

B. Products of a manufacturer maintaining complete service and parts facilities in Alabama continuously for the last three (3) years: Trane, Johnson, Siemens, or approved equal.

C. Control equipment, except for items comprising an integral part of the water or refrigeration piping, shall be installed by trained mechanics employed by the Control Manufacturer.

D. Include the services of a full time control technician for calibrating and adjusting controls for the first 5 working days after Owner has occupied building.

E. Before installation, submit for approval five (5) copies of complete power and control wiring and piping diagrams. Hang a photostatic copy of the approved diagram, framed behind glass, in each equipment room. Provide one (1) set of reproducible sepias of "As-Built" control diagrams at completion of project for the Owner's use.

F. Provide permanent nameplates for control switches and motor starters. Nameplates: engraved laminated plastic with letters legible under normal operating conditions. (White on black).

G. Permanently identify control devices other than room thermostats, so they may be identified on control diagrams. Provide engraved plastic nameplates for items mounted outside of or on faces of panels. Mark other instruments with indelible ink.

2.2 CONTROL WIRING:

A. Include control and interlock wiring and power wiring for control panel in this Section. Install in conduit in accordance with provisions of Electrical Work where exposed, concealed in walls or above ceilings other than lay-in type. Provide plenum rated cable above lay-in ceilings (for plenum or non-plenum).

B. Waterproof and firestop all conduit floor penetrations. Firestop conduit penetrations of fire rated walls partitions.

C. Wire all devices individually to terminal strips in control panels.
D. Furnish necessary relays and auxiliary contactors and other accessories required. Provide interlock relays per NEC. Coordinate start-stop stations, auxiliary contacts, etc., with supplier of Starters, Variable Frequency Drive (VFD) and Motors Control Centers specified in Electrical Work.

2.3 CONTROL DEVICES:

A. Room Thermostats: (Provide seven (7) day occupied/unoccupied, 24 hour, multi-stage programmable thermostats, with 3-hour override, and battery back-up equal to Johnson T310 or equals by Trane, or Siemens.) Unless otherwise shown provide proportional action relay thermostats with key operated adjustments digital readout without thermometers. Thermostat covers: high impact plastic. Mount room thermostats with tops 4 feet above floors. Provide night low limit thermostat for each zone. They shall override thermostat to maintain minimum space temperature.

B. Remote Bulb Thermostats (DDC) and Temperature Transmitters (DDC): Unless otherwise shown use averaging elements not less than 12 feet long for duct or casing cross sections for each 24 square feet of face area.

C. Thermometers: Pipe line thermometers are specified in another Section. Install digital readout thermometers in ducts where shown on control diagrams, providing averaging bulbs where shown and/or required.

D. Valves: See Section 15050 "MATERIALS AND METHODS".

E. Freezestats: Manual reset, pneumatic not permitted. Locate freezestat bulbs between preheat and chilled water coils in units with chilled water coils and downstream from DX coils in units with DX coils. Provide coverage for each 3’ X 3’ coil face area section.

F. Firestats: Single pole double throw, electric, manual reset, pneumatic not permitted. Firestats shown to be connected to the fire alarm system: compatible with fire alarm system, furnished and installed under Controls, wired under Electrical Work. Firestats to be installed in all fans where smoke detectors are not furnished.

G. Valve and Damper Operators: Of sufficient power to close/open valves and dampers under operating conditions. Electric valve and damper motors shall have oil immersed gear trains and spring return to normal position.

H. Wells: Install pipe line mounted control and indicating devices in stainless steel or brass thermometer wells.

I. Capillary Supports: Securely support all duct-mounted and casing-mounting thermostat capillaries using factory fabricated copper bulb supports.

J. Provide stand-offs for control devices mounted on externally insulated ducts and equipment.

K. Anchor all items mounted on gypsum board (dry-wall) using toggle bolts or moly bolts, not expansion shields.

L. Branch Pressure Gauges: Provide 1-1/2" dial branch pressure gauges as close as possible to each valve and damper operator (use 1" gauges on air terminal dampers). Provide 1" minimum dial gauges on each port of each instrument, including receiver-controllers, transmitters, P.E. switches, etc.
Provide 1" minimum dial gauge on each air terminal damper operator. (Gauge and P.E. switches on terminals furnished by Terminal Manufacturer).

### 2.4 CONTROL POWER:

A. All 120 Volt wiring shall be the responsibility of the Control Sub-Contractor from circuit furnished under Electrical Section.

B. Power wiring to all automatic dampers shall be included under this section.

C. Wiring and relays between light and fans for interlock shall be included under this section.

### 2.5 CONTROL PANELS:

A. Local Control Panels: Construct of galvanized steel with baked enamel finish or aluminum-plywood-aluminum fronts and backs and extruded tops, bottoms, and ends. All panels shall have piano hinges and key locking latches (key panels alike). Permanently label instruments located in panels consistent with labeling on control diagram. Cement photostat of approved diagram inside each panel cover. (Include Local-Remote switching for control point adjusters on face of each panel).

### 2.6 CONTROL SEQUENCES:

A. Packaged AC Unit Controls:

1. AC Units to be started and stopped by:
   
   a. Smoke detector in supply duct.
   b. Fire Alarm Relay - see Electrical.
   c. Thermostat Schedule
   d. Factory Safeties
   e. Override

2. When respective AC Unit controls are energized:

   a. Automatic outside air damper shall open to minimum position.
   b. Supply fan shall start.

3. Room thermostat upon a rise in room temperature shall energize condensing unit controls to load and unload compressors and start/stop condenser fans or upon a drop in room temperature shall stage electric heater to maintain room thermostat set point.

4. Provide night low limit to energize unit to maintain 55°F. after hours. Upon activation of night low limit thermostat unit shall operate in occupied mode until satisfied, except outside air damper shall remain closed, then unit shall be de-energized.

B. General Interlock Exhaust Fans: Respective fans to be interlocked to operate as scheduled. Provide remote switch if indicated on plans. Interlock fans with auto dampers on intake and exhaust louvers. Provide H-O-A switches for all fans, locate in nearest mechanical room or janitor closet.
PART 3 - EXECUTION:

3.1 INSTALLATION:

A. Control diagrams on drawings and/or Control Sequences are intended to indicate, in general, control arrangements. Provide all instruments, relays, operators, switches, etc. required to accomplish control sequences whether or not such devices are actually shown.

END OF CONTROLS
SECTION 16000

COVER - RCR

DIVISION 16

ELECTRICAL SPECIFICATIONS

PREPARED BY

ROBERT C. RENFRO

8/16/2013
SECTION 16050

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 DESCRIPTION

A. General Conditions:
   1. The accompanying General Conditions (front-end specifications) shall apply to and form a part of this section.

B. General Requirements:
   1. Carefully examine General Conditions, other specification sections, and other drawings (in addition to Electrical) in order to be fully acquainted with their effect on electrical work.
   2. Do all work in compliance with all applicable codes, laws, and ordinances, the National Electrical Safety Code, the National Electrical Code (hereinafter referred to as “Code”), and the regulations of the local utility companies. Obtain and pay for any and all required permits, inspections, certificates of inspections and approval, and the like.
   3. Cooperate with other trades and contractors at job. Perform work in such manner and at such times as not to delay work of other trades. Complete all work as soon as the structure and installations of equipment will permit. Patch, in a satisfactory manner and by the proper craft, any work damaged by electrical workmen.
   4. Electrical contracting firm shall be licensed as an electrical contractor in the state where work will be performed.

1.2 GENERAL SCOPE OF ELECTRICAL WORK (REFER TO DRAWINGS FOR OTHER SPECIFIC SCOPE ITEMS)

A. Furnish all labor and materials to complete electrical work as shown on drawings and/or herein specified.

B. Remove all existing electrical equipment and wiring made obsolete by this project and remove or relocate all electrical services located on or crossing through the project property, either above or below grade, which would obstruct the construction of the project or conflict in any manner with the completed project or any code pertaining thereto. Dispose of salvageable materials as directed by the Architect.

C. Furnish and install complete power, telephone and other electrical services as shown on drawings and/or specified herein.

D. Pay all electrical utility company service charges (if any) in connection therewith, including permanent meter deposit. Meter deposits will be refunded to Contractor at time of Owner’s acceptance.

E. Furnish and install complete power distribution system as shown on drawings and/or specified herein.

F. Furnish and install disconnect switches for motors as shown on drawings and/or specified
Furnish and install complete electrical grounding systems as shown on drawings and/or specified herein.

G. Furnish and install complete electrical grounding systems as shown on drawings and/or specified herein.

H. Install and connect electrical equipment mentioned in Division 16 Specifications or noted in drawings, whether furnished by electrical contractor or by others.
   1. Where shown or specified, equipment furnished by others shall be installed and connected under this Contract.
   2. Where shown or specified, Contractor shall receive, unpack, check and assume custody of equipment furnished by Others. Contractor shall assume responsibility for care and safekeeping of this equipment, when delivered into his custody. He shall protect it from moisture, dust and damage during construction and until Owner acceptance of project.

I. Furnish and install complete electrical lighting systems as shown on drawings and/or specified herein.

J. Furnish and install all electrical items shown on drawings and/or herein specified, unless shown or specified otherwise.

K. Furnish and install complete controls & auxiliary systems as shown on drawings and/or specified herein.

L. Furnish and install complete telephone/data raceway (including all outlet boxes, face plates, conduit raceways, telephone backboards, terminal cabinets, etc.) system as shown on drawings and/or specified herein.

M. Furnish and install a complete Fire Alarm System as shown on drawings and/or specified herein.

N. Furnish and install a complete Surge Protection System as shown on drawings and/or specified herein.

O. Procure and pay for permits and certificates as required by local and state ordinances and fire underwriter’s certificate of inspection.

P. Balance loads as equally as practicable on services, distribution feeders, circuits and buses. Provide typewritten directory for each panel.

Q. Complete field testing, adjustment & startup of all systems listed above as shown on drawings and/or specified herein.

PART 2 - PRODUCTS

2.1 APPROVED MATERIALS AND DEVICES

A. Where not otherwise specified, provide only new, standard, first-grade materials throughout, conforming to standards established by Underwriter’s Laboratories, Inc., and so marked or labeled, together with manufacturer's brand or trademark. All equipment subject to approval of
Architect before installation. All like items and associated equipment shall be of one manufacturer.

B. To insure proper coordination, it is intended that all electrical equipment and materials specified in Division 16 of these specifications and shown on the electrical drawings be furnished and installed by the electrical sub-contractor. It will not be permissible for any of these items to be furnished directly by the general contractor without the electrical contractor’s coordination.

C. To insure commonality of spare parts, it is required that the electrical contractor provide the same brand for all circuit breakers, starters, power equipment, etc. provided under the following divisions of these specifications:
1. SECTION 16410: SAFETY SWITCHES AND FUSES
2. SECTION 16441: POWER PANELBOARDS - CIRCUIT BREAKER TYPE
3. SECTION 16442: LIGHTING PANELBOARDS

2.2 SUBMITTALS

A. All submittals to the design team shall be accompanied by a letter summarizing all proposed deviations from specified products or pre-approved substitutions. The absence of such a letter shall be understood to indicate that the contractor intends to meet all contract requirements, regardless of cut-sheets/data-sheets provided within the submittal.

B. Submit to Architect ten (10) days prior to bid date three (3) copies of any items and/or manufacturers which are proposed as substitutes for those specified.

C. Submit to Architect promptly after award of Contract and prior to purchasing, the number of copies required by the contract. All drawings of a specific item or system shall be made in one submittal, and within thirty (30) days after award of Contract. Shop drawings of all power equipment shall contain exact details of device placement, phasing and numbering, in form of elevations, for each major piece of equipment. Shop drawings shall be submitted on the following:
1. SECTION 16289: SURGE PROTECTIVE DEVICES
2. SECTION 16410: SAFETY SWITCHES AND FUSES
3. SECTION 16441: POWER PANELBOARDS - CIRCUIT BREAKER TYPE
4. SECTION 16442: LIGHTING PANELBOARDS
5. SECTION 16511: LIGHTING MATERIALS AND METHODS
6. SECTION 16721: FIRE ALARM SYSTEM
7. ALL MISCELLANEOUS POWER DISTRIBUTION EQUIPMENT
8. ALL ELECTRICAL AND TELECOMMUNICATION ROOM LAYOUTS - Submittals shall include ¼" = 1'-0" CAD drawings (hand drawn sketches will not be accepted) of each electrical and IT room indicating all panelboards, transformers, switchboards, equipment racks, control panels, HVAC equipment, etc. that are located in each room. Layouts shall show that each piece of electrical equipment has the clearances, working space and dedicated equipment space required by applicable codes. No conduits to equipment within these rooms shall be installed until submittals have been provided and returned without exception by the design team.

D. The contractor shall fully review, comment upon and correct all shop drawings as required to
assure compliance with contract documents prior to submittal to Architect. The failure of the contractor to properly review and correct shop drawings prior to submittal will result in rejection of shop drawings by the engineer. Review by the Architect will be for general conformance with contract documents. The contractor shall be fully responsible for correctness of all submitted dimensions, details, quantities and locations.

E. None of the above items shall be installed until shop drawings or catalog data have been reviewed by Architect without rejection or required resubmittal. Any listed item not submitted, even if specified, shall be considered not acceptable and shall be removed if directed.

F. Any required resubmittal will be reviewed by the Architect for conformance with previously issued comments only. The contractor shall be responsible for verifying that all items not specifically requiring resubmittal have not been altered from the previously reviewed submittal.

G. Material proposed for substitution shall be of the same quality, perform the same functions, conform to such physical dimensions and appearance as are required by the Architect. All material proposed for substitution is subject to the approval of the Architect and his authority for approval is final. No material proposed for substitution will be considered unless all submittal data complies with the drawings and specifications of Section 16 as to time of submission, number of copies of submittal, and detail requirements.

H. Samples of material shall be furnished where required by drawings or Division 16 Specification, or as requested by the Architect on items proposed as substitutes.

I. Submit to Architect a certificate of final inspection from local inspection department.

PART 3 - EXECUTION

3.1 SITE VISIT

A. The Contractor shall visit the site to determine existing dimensions and conditions affecting electrical work. Failure to do so in no way relieves Contractor of his responsibility under Contract.

3.2 CLEARANCE WITH UTILITIES

A. It shall be the responsibility of this Contractor, prior to bid, to reaffirm with the utility companies involved, that the locations, arrangement (and with power company voltage, phase, and metering required) and connections to utility service are in accordance with their regulations and requirements. If their requirements are at variance with these drawings and specifications, the Contract price shall include any additional cost necessary to meet those requirements without extra cost to Owner after a contract is entered into.

B. On many projects the utility company may levy charges due to locations, size or type service involved. The Contractor shall be responsible for these charges (including permanent meter deposit), unless such charges are not available prior to bid and Contractor so documents as described below. The meter deposit will be refunded to the contractor at time of Owner’s acceptance.
C. Should above cost not be available, prior to bid, Contractor must submit a letter signed by a responsible utility company person so stating with his bid and in turn must be submitted by Prime Contractor with his bid to Owner. The cost will then be deleted from the Contract and become responsibility of the Owner.

D. Arrange with utility companies for such services as shown or herein specified and installation of meter where shown. Furnish with shop drawings a signed document from utility companies describing the location and type of services to be furnished and any requirements they may have. This document shall be signed for each utility company by a person responsible for granting such service.

3.3 WORKMANSHIP


B. All work shall be executed in a workmanlike manner and shall present a neat and mechanical appearance upon completion.

C. All items shall be installed straight and plumb in a workmanlike manner and care shall be exercised so that like items are mounted the same position, heights and general location.

D. Keep site clean of accumulation of cartons, trash and debris.

3.4 SAFETY

A. The contractor is solely responsible for all job safety. Architect assumes no responsibility for job safety. Maximum consideration shall be given to job safety and only such methods as will reasonably insure the safety of all persons shall be employed. The codes and regulations of OSHA shall be given strict compliance as well as such other codes, laws, and regulations as may be applicable.

3.5 CONTRACT DOCUMENTS

A. Contract documents indicate diagrammatically, extent, general character and approximate location of work. Where work is indicated but minor details omitted, furnish and install it complete so as to perform its intended functions. For details and mechanical equipment, follow drawings provided by other disciplines (Architectural, Mechanical, Structural, Civil, etc.) and fit electrical work thereto.

B. Contract documents consist only of the hardcopy documents issued by the Prime Architect. Electronic documents issued directly by the electrical engineer to the contractor and/or its subcontractors/vendors are issued for convenience only (electronic documents are not formal contract documents).

C. If the contractor and/or one of its suppliers require a one-time transfer of electronic files of the current electrical construction documents to prepare shop drawings (or for another similar purpose), it shall:
1. Sign a waiver prepared by the electrical engineer prior to the transmittal of these files.
2. Agree to pay the electrical engineer a fee of $50.00 per drawing, up to a maximum of $400 per transfer, payable upon receipt of the files.
3. To the fullest extent permitted by law, indemnify, hold harmless, and defend JRA from all claims, damages, losses and expenses, including attorneys’ fees arising out of or resulting from the use of the CAD files.

D. Take finish dimensions at job in preference to scaled dimensions.

E. Except as above noted, make no changes in or deviations from work as shown or specified except on written order of Architect.

3.6 EQUIPMENT STORAGE

A. Store all electrical equipment in dry, covered locations as directed by equipment manufacturers. Contractor shall be responsible for replacing or repairing improperly-storred equipment as directed by Architect.

3.7 EXCAVATION, CUTTING AND PATCHING

A. Perform all cutting and excavating as necessary for installation of electrical systems, unless specifically covered under another section. After Architect’s observation, complete all excavation, filling and backfilling as directed under specifications for preparation of site and earthwork. Foundations for equipment shall be as specified under concrete section. Concrete pads shall be minimum of 6” thick; unless greater thickness required by equipment manufacturer. Obtain specific approval of Architect before cutting into any structural members.

B. For all such work employ competent workmen, and finish up in neat and workmanlike manner, equal to quality and appearance to adjacent work.

3.8 ROOF PENETRATION

A. Furnish roof flashing for all equipment installed under Division 16 that penetrates through the roof. Appropriate flashing is specified under roofing and sheet metal section. Supply these flashings for installation under roofing and sheet metal section.

3.9 INSTALLATION OF EQUIPMENT - GENERAL

A. Care shall be exercised in exact routing and location of all items so as not to obstruct access to equipment, personnel walkways, or expose it to potential mechanical damage.

B. Items shall be securely anchored and/or fastened. All construction shall meet the seismic design requirements of the building code. Items (especially transformers, light fixtures, equipment racks, freestanding gear, etc.) installed in seismic zones C, D, E or F shall be supported and braced per applicable codes and standards.

C. All wall, pole or frame-mounted electrical equipment shall be mounted to metal unistrut (or similar) frames of same material as electrical equipment. For example, pole-mounted painted or galvanized steel disconnect switches shall be mounted to galvanized steel unistrut frames.
D. All electrical equipment, furnished by Contractor or by others shall be covered and protected during construction.

E. All control cabinets, panels, motor control centers and other electrical cabinets and enclosures shall have all trash removed and be vacuumed clean. All foreign paint, etc., shall be removed from exterior and all scratches in finish touched up with same color and material as original. Any rusted areas shall be sanded, primed and repainted.

F. All relays, starters, push-button and other control devices shall be cleaned and if necessary, lubricated with CRC 2-26 to assure free operation.

3.10 MOTORS, STARTERS AND CONTROLS

A. Unless otherwise specified or shown, all motors will be furnished and installed under other sections of this specification.

B. Electrical Contractor shall install all starters and all electrical power wiring and connections to motors and starters.

C. Unless otherwise specified or shown, all control items for motors shall be furnished, installed and wired in conduit under other divisions of this specification.

3.11 CIRCUITS AND BRANCH CIRCUITS

A. Outlets shall be connected to branch circuits as indicated on drawings by circuit numbers. No more outlets than are indicated shall be connected to a circuit.

B. Branch circuit homeruns shall be installed as shown on drawings. Multiple homerun conduits shall not be combined by contractor into larger, single homerun conduits unless specific permission is granted by the Engineer.

3.12 LUG/Terminal RATINGS

A. All lug/terminal ratings, sizes, locations, types, etc. shall be coordinated with the associated conductor sizes, types, routings, etc. by the contractor.

3.13 OUTLET LOCATION

A. Symbols shown on drawings and mounting heights indicated on drawings and in specifications are approximate only. The exact locations and mounting height must be determined on the job and it shall be the Contractor’s responsibility to coordinate with other trades to insure correct installation.

3.14 IDENTIFICATION

A. Each panel shall have each circuit identified. Panels without branch circuit nameplates shall have typewritten directories.

B. Each individually mounted switch, circuit breaker, starter and/or any other control or protective device shall identify equipment fed and fuse size, if any, by engraved plastic nameplate, white with black letters, screw attached.
C. See Specification Section 16075 for additional requirements.

3.15 **GROUNDING**

A. All equipment shall be grounded and bonded in accordance with all state/local regulations, The National Electrical Code and as specified herein.

3.16 **TELEPHONE WORK**

A. Provide telephone raceways, outlets and backboards, as shown. Provide additional work as shown on drawings. Bond all raceways together at backboards and provide No. 6 ground wire extending from raceway bonds to cold water pipe, in 1/2 inch raceway. Carefully ream ends of all raceways.

3.17 **PAINTING**

A. Refer to Painting/Finishing specifications for requirements regarding field painting of exposed conduit. Any scratches, dents or rust spots in conduit electrical enclosures, panels, motor control or any other electrical items shall have the dents removed, and they, along with any rust spots or scratches, sanded and touched up with the same exact color paint as original finish.

3.18 **ACCEPTANCE TESTING**

A. Upon completion of work, the entire electrical system installed within this project shall be tested and shall be shown to be in perfect working condition, in accordance with the intent of the specifications and drawings. It shall be the responsibility of the Electrical Contractor to have all systems ready for operation and to have an electrician available to operate same in accordance with and under the supervision of the observation representative(s) of the Architect. The Electrician shall be available to assist in removal of panel fronts, etc., to permit inspection as required.

B. The electrical sub-contractor shall include in bid price start-up assistance and training from a certified representative of the manufacturer for the following systems:
   1. SECTION 16721: FIRE ALARM SYSTEM

3.19 **OPERATION AND MAINTENANCE DATA**

A. One set of marked “AS BUILT” drawings, three (3) sets of all equipment catalog and maintenance data and three (3) sets of all final shop drawings, on all equipment requiring same shall be turned over to owner. These items shall be bound in hard back book. Contractor shall explain and demonstrate all systems to Owner’s representative.

3.20 **GUARANTY-WARRANTY**

A. Furnish a written Guarantee-Warranty, countersigned and guaranteed by General Contractor, stating:
   1. That all work executed under this section will be free from defects of workmanship and materials for a period of one (1) year from date of final acceptance of this work.
   2. Above parties further agree that they will, at their own expense, repair and replace all such defective work, and all other work damaged thereby, which becomes defective during the term of the Guaranty-Warranty.
END OF SECTION 16050
PART 1 - GENERAL

1.1 GENERAL

A. THE WORK UNDER THIS SECTION INCLUDES BUT IS NOT LIMITED TO GROUNDING OF THE FOLLOWING:
   1. Service Equipment.
   2. Transformers.
   3. Non-current carrying conductive surfaces of equipment.
   5. Structures.
   6. Other Equipment.

1.2 GENERAL REQUIREMENTS

A. All equipment, building steel, and main service shall be effectively and permanently grounded with a conductor cross section as required by the National Electrical Code and of capacity sufficient to insure continued effectiveness of the ground connections for fault current. Ground conductors shall be as short and straight as possible, protected from mechanical injury and, if practicable, without splice or joint.

B. All grounding connections shall be installed in accordance with the National Electrical Code and all local codes and requirements. Such codes shall be considered minimum requirements and the installation of the grounding system shall insure freedom from dangerous shock voltage exposure and provide a low impedance ground fault path to permit proper operation of overcurrent and ground fault protective devices.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. All grounding conductors shall be insulated with green colored, 600 volt insulation unless noted otherwise.

B. Motors having power supplied by single conductor wire in conduit shall be grounded through the conduit system. Flexible conduit shall be “jumpered” by an appropriate bonding conductor.

2.2 GROUNDING ELECTRODES

A. Grounding electrodes shall be copper-clad steel rods 3/4 inch in diameter and ten feet long. Where longer electrodes are necessary to reduce the ground resistance, Contractor shall provide sectional rods, connectors, drive heads, etc.

2.3 CONNECTIONS

A. All conductor-to-conductor, conductor-to-ground rod, conductor-to-structure, conductor-to-
fence connections of #6 and larger sized conductors and underground ground connections shall be permanent exothermic welded connections (Cadweld or equal) unless otherwise noted on applicable drawings.

B. Connections to equipment shall be by bolted compression type lugs (except for motors). When the conductor is #6 and larger, the lug shall be joined to the conductor by an exothermic weld (Cadweld or equal).

C. Motors to be grounded by the grounding conductors run with the power conductors shall have a split-post grounding stud installed in the connection box.

D. Each cast pull box or junction box shall have a ground lug, connected to largest ground conductor to enter box.

E. Ground connections at conduit terminations shall be made by approved grounding bushings (see Raceways Specification Section for additional requirements).

2.4 MANUFACTURERS

A. Conduit clamps and connectors shall be manufactured by Raco, OZ., or Ercon.

B. Lugs shall be as manufactured by Square “D”, Burndy, or T and B.

C. Exothermic weld connections shall be as manufactured by Cadweld, or approved equal.

D. Ground rods shall be as manufactured by Joslyn or McGraw Edison.

E. Split post grounding shall be as manufactured by Burndy or T and B.

PART 3 - EXECUTION

3.1 MAIN SERVICE GROUND

A. The main service grounding electrode system shall consist of the following items bonded together by the grounding electrode conductor:

1. The main underground cold water pipe (metal).
2. The metal frame of the building.
3. Driven ground rods. Ground rods shall be embedded at the lowest point in the building and below the permanent moisture level. Ground rods shall be spaced a minimum of six (6) feet apart and connected in parallel until resistance to ground does not exceed five (5) ohms.

B. The grounding electrode system shall be connected to the grounded conductor (neutral) on the supply side of the service disconnecting means by a grounding electrode conductor not smaller than that shown in Table 250.66 of the N.E.C. The main service equipment grounding conductor shall be connected to the grounding conductor on the supply side of the service disconnecting means in accordance with Table 250.122 of the N.E.C. for the ampere rating of the service entrance equipment. Where in a service entrance switchboard, the equipment grounding conductor shall not be less than 25% of the main bus rating. These connections shall
be made inside the service entrance equipment enclosure.

3.2 TRANSFORMER GROUNDS

A. Dry type insulation transformers with a grounded conductor in the secondary shall be grounded in accordance with N.E.C. Section 250-26.

3.3 EXPOSED NON-CURRENT-CARRYING METAL PARTS

A. General: Ground connections to equipment or devices shall be made as close to the current carrying parts as possible, that is, to the main frame rather than supporting structures, bases or shields. Grounding connections shall be made only to dry surfaces that are clean and dry. Steel surfaces shall be ground or filed to remove all scales, rust, grease, and dirt. Copper and galvanized steel shall be cleaned to remove oxide before making welds or connections. Code size ground conductors shall be run in all power conduits and properly terminated at each end.

B. Motors: Exposed non-current-carrying metal parts, shall be grounded by a grounding conductor either run with power conductors, and/or separate grounding conductors. Drawings will show method(s) to be used. The ground conductors with all motor conductors shall be connected to the ground buss in the motor connection box. Jumper connections shall be installed between frames and rigid conduit for equipment having flexible conduit connections (sealtight). All AC motor grounds shall provide a low impedance path to ground.

C. Raceways & boxes: All raceways, conduits, armored or shielded cable and all exposed non-current carrying metal parts shall be grounded. Such items shall be bonded together and permanently grounded to the equipment ground buss. Metallic conduits shall be connected by grounding or clamps to ground buss. Flexible “jumpers” shall be provided around all raceway expansion joints. Bonding straps for steel conduit shall be copper. Jumper connections shall be provided to effectively ground all sections or rigid conduit connected into plastic pipe. No metallic conduit shall be left ungrounded. In conduit systems interrupted by junction or switch boxes where locknuts and bushings are used to secure the conduit in the box, the sections of conduit and box must be bonded together. If conduit, couplings or fittings have a protective coating or non-conductive material, such as enamel, such coating must be thoroughly removed from threads of both couplings and conduit and the surface of conduit or fitting where the ground clamp is secured.

D. Enclosures: Metal conduits entering free standing motor control centers, switchboards or other free standing equipment shall be grounded by bare conductors and approved clamp. Any conduits entering low voltage (480 volts or below) equipment through sheet metal enclosure and effectively grounded to enclosure by double locknut or hub need not be otherwise bonded.

E. Equipment: In addition to equipment grounding provisions mandated by code requirements, additional equipment grounding provisions (including local ground rods, connections, etc.) shall be provided by the contractor as directed by equipment suppliers.

F. Both ends of ground busses in motor control centers, switchboards, etc., shall be separately connected to the main ground buss to form two separate paths to ground.

G. Fences and Grills: Fences and metal grills around equipment carrying voltage above 500 volts
between phases shall be bonded together and to ground. Fences and grill work shall be
grounded at every post, column, or support, and on each side of every gate.

3.4 ACCEPTANCE DOCUMENTATION AND TESTING

A. Contractor shall take and store photographs of all underground grounding system connections
prior to burial of connections, for review by Engineer.

B. Upon completion of work, the entire ground system shall be shown to be in perfect working
condition, in accordance with the intent of the Specifications.

C. Contractor shall measure the resistance between the main ground bonding jumper to true earth
ground. If this value is greater than five ohms, additional grounding electrodes shall be
installed as described in Part 3.1 above. The final ground resistance value shall be submitted to
the Architect prior to the final observation.

END OF SECTION 16060
PART 1 - GENERAL

1.1 DESCRIPTION

A. Wire and cable identification.

B. Pullbox & Junction Box Identification

C. Electrical distribution & utilization equipment identification.

D. Emergency and Standby Power receptacle identification.

PART 2 - PRODUCTS

2.1 WIRE AND CABLE IDENTIFICATION

A. Intermediate Locations within pullboxes/junction boxes through 4-11/16”:
   1. Wires and cable labels shall be non-ferrous identifying tags or pressure sensitive labels unless noted otherwise.
   2. Intermediate Locations within pullboxes/junction boxes larger than 4-11/16” and within cable trays:
      3. Wires and cable labels shall be white thermal transfer marker plates (sized to accommodate three lines of text) permanently affixed to the associated cable with UV-resistant plastic wire ties, with two wire ties (one on either end of marker plate to provide a flush installation) where cabling is exposed (such as within cable trays). Labels shall be Panduit #M200/300X series or equal.
      4. Circuit/Cable Termination Locations:
         5. Wires and cable labels shall be non-ferrous identifying tags or pressure sensitive labels unless noted otherwise.

2.2 ELECTRICAL DISTRIBUTION & UTILIZATION EQUIPMENT IDENTIFICATION

A. Labels on electrical distribution & utilization equipment shall be black-on-white engraved Bakelite nameplates permanently affixed to the equipment with rivets or silicone adhesive unless noted otherwise.

B. Labels on electrical distribution equipment fed from emergency or legally-required standby sources (such as emergency generators) shall be white-on-red engraved Bakelite nameplates permanently affixed to the equipment with rivets or silicone adhesive.

2.3 EMERGENCY AND STANDBY POWER RECEPTACLE IDENTIFICATION

A. Receptacles fed from emergency or standby power sources (such as emergency generators) shall be provided with factory-marked engraved coverplates as follows:
   1. Emergency System source: Red engraved lettering to read “EMERGENCY”.
   2. Legally-Required or Optional Standby Generator source:
PART 3 - EXECUTION

3.1 GENERAL

A. Any proposed deviation in identification methods and materials from those described herein shall be submitted to Architect for review and comment prior to installation.

B. Contractor shall provide all labeling or identification required by applicable local, state and national codes. These specifications do not intend to itemize all code-required labeling or identification requirements.

3.2 WIRE AND CABLE IDENTIFICATION

A. Intermediate Locations within pullboxes/junction boxes through 4-11/16”:

1. Intermediate Locations within pullboxes/junction boxes larger than 4-11/16” and within cable trays:
   - Thermal transfer labels shall be securely fastened to all cables, feeders and power circuits, in vaults, pull boxes, junction boxes, manholes, approximately every 50 feet within cable trays (especially at locations where cables exit or diverge), and other similar locations. Labels within cable trays shall be grouped (rather than being pre-labeled on cables and pulled into cable trays).
   - Labels shall be stamped or printed with the following data so that the feeder or cable can be readily identified and traced:
     a. From where the circuit originates (including panel designation and circuit number):
        1) Ex: “FROM: PP-A CIR. 3 (IN MAIN ELEC ROOM)”
     b. To where the circuit extends (using the common name of the equipment):
        1) Ex: “TO: RTU-6 (ON ROOF)”
     c. The purpose of the circuit:
        1) Ex: “POWER”
     d. The set number (If parallel power feeds are used):
        1) Ex: “SET NO. 3 OF 4”

2. Circuit/Cable Termination Locations:
   - Where multiple termination points exist within a panelboard, switchboard, MCC, starter, or other similar circuit endpoint, labels shall be securely fastened to all cables, feeders and power circuits to clearly identify the terminal associated with each conductor or cable. For example, within lighting panels, each conductor shall be labeled at a clearly visible location with the associated circuit number, so that if all conductors were unterminated, the labels would clearly indicate which conductor was associated with each circuit.

B. Refer to Specification Section 16120 for all color-coding requirements of wires and cables.

3.3 PULLBOX & JUNCTION BOX IDENTIFICATION

A. Concealed pullboxes/junction boxes:
1. Front surface of all pullbox/junction box covers in concealed areas (such as above lay-in ceilings) or within mechanical/electrical rooms (and other similar areas where appearance of boxes is not an issue) shall be neatly marked with the ID of circuits/cables contained with permanent black marker on cover of box (Ex: “RP-1A Cir. 1, 2 & 3”). Additionally, front surface of box shall be painted red where box contains fire alarm system cabling.

B. Exposed pullboxes/junction boxes:
1. Interior surface of all pullbox/junction box covers in exposed areas shall be labeled “Power”, “Telecommunications”, “Fire Alarm” or with other similar general text neatly with permanent black marker to indicate function of box. Circuit/cable labeling within box (see above) shall identify specific cables contained. Additionally, interior surface of cover shall be painted red where box contains fire alarm system cabling.

C. Where pullboxes/junction boxes are named on contract documents (Ex:”PULLBOX #3”), an engraved nameplate shall be installed on the front surface of the box to identify the name.

3.4 ELECTRICAL DISTRIBUTION & UTILIZATION EQUIPMENT IDENTIFICATION

1. All Panels, Motor Control Centers, Switchboards, Switchgear, Transformers, Etc.:
2. Engraved nameplates identifying name of equipment, nominal voltage and phase of the equipment and where the equipment is fed from shall be installed on front surface of all panels, motor control centers, switchboards, switchgear, transformers, etc.:
3. Refer to Panelboard Specification Sections for additional labeling requirements (circuit directory cards, permanent circuit labels, permanent circuit numbers, etc.) required inside panelboards.

B. Safety/Disconnect Switches and Utilization Equipment (HVAC Equipment, Control Panels, Starters, Etc.):
1. Engraved nameplates identifying equipment being fed and where the equipment is fed from shall be installed on front surface of all disconnect switches (including both visible blade type switches and toggle-type switches) and on utilization equipment (where not clearly identified by immediately adjacent local disconnect switch):
2. Where safety/disconnect switches are installed on the load side of variable frequency drives, the safety/disconnect switch shall be furnished with an additional engraved nameplate to read: “WARNING: TURN OFF VFD PRIOR TO OPENING THIS SWITCH”.
3. Safety/Disconnect switches feeding equipment that is fed from multiple sources (such as motors with integral overtemperature contacts that are monitored via a control system) and Utilization Equipment fed from multiple sources shall be furnished with an additional BLACK-ON-YELLOW engraved nameplate to read: “WARNING: ASSOCIATED EQUIPMENT FED FROM MULTIPLE SOURCES – DISCONNECT ALL SOURCES PRIOR TO OPENING COVER”.

C. Emergency Systems:
1. A sign shall be placed at the service entrance equipment indicating the type and location of on-site emergency power sources (such as generators, central battery systems, etc.) per NEC requirements.
2. All boxes and enclosures (including transfer switches, generators, power panels, junction boxes, pullboxes, etc.) dedicated for emergency circuits shall be permanently marked with white-on-red engraved nameplates so they will be readily identified as a component of an emergency circuit or system.

D. Services:
1. All Service Equipment:
   a. Engraved nameplates identifying maximum available fault current, including date the fault current calculation was performed.
   2. Where a building or structure is supplied by more than one service (or any combination of branch circuits, feeders and services), a permanent plaque or directory shall be installed at each service disconnect location denoting all other services, feeders & branch circuits supplying that building or structure and the area served by each, per NEC requirements.

3.5 EMERGENCY AND STANDBY POWER RECEPTACLE IDENTIFICATION

A. Receptacles fed from emergency or standby power sources (such as emergency generators) shall be provided with factory-marked engraved coverplates as described above.

3.6 OTHER IDENTIFICATION

A. Factory-engraved coverplates identifying functions of light switches and other similar devices shall be installed where so required by plans/specifications.

END OF SECTION 16075
SECTION 16110

RACEWAYS

PART 1 - GENERAL

1.1 DESCRIPTION

A. THE WORK UNDER THIS SECTION INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
   1. Conduits
   2. Conduit Fittings
   3. Couplings & Connectors
   4. Bushings
   5. Raceway Hardware, Conduit Clamps & Supports
   6. Watertight Entrance Seal Devices

PART 2 - PRODUCTS

2.1 CONDUITS

A. Rigid Galvanized Steel and I.M.C.:
   1. Shall be galvanized outside and inside by hot dipping.
   2. Shall be as manufactured by Republic, Wheatland, Triangle, Pittsburg Standard, Youngstown, Allied or equal.

B. E.M.T.:
   1. Shall be Electro-Galvanized.
   2. Shall be as manufactured by Republic, Wheatland, Triangle, Pittsburg Standard, Youngstown, Allied or equal.

C. Rigid Aluminum:
   1. Shall be manufactured of 6063 Alloy, T-1 temper.
   2. Shall be as manufactured by Republic, Wheatland, Triangle, Pittsburg Standard, Youngstown, Allied or equal.

D. Schedule 40 and 80 PVC:
   1. Shall be composed of polyvinyl chloride and shall be U.L. rated type 40 or 80 for use with 90 degree rated conductors. Conduit shall conform to NEMA Standards and applicable sections of N.E.C.
   2. The conduit manufacturer shall have had a minimum of 5 years experience in the manufacture of the products. Non-metallic raceways shall be as manufactured by Carlon, Triangle, Can-Tex, Allied or equal.

E. HDPE Innerduct
   1. Shall be composed high density polyethylene and shall be orange in color, unless noted otherwise.
   2. Shall be corrugated unless noted otherwise.
   3. Shall be manufactured by Carlon, Ipex or equal.
F. Flexible Metallic Conduit:
   1. Shall be continuous spiral wound and interlocked galvanized material, code approved for
      grounding.

G. Liquidtight Flexible Metallic Conduit:
   1. Shall be corrosion-resistant aluminum-core sealite, code approved for grounding.
   2. Shall have an outer liquidtight, nonmetallic, sunlight-resistant jacket over an inner flexible
      metal core.
   3. Shall be as manufactured by UA, Electric-Flex, Anaconda or equal.

2.2 FITTINGS, COUPLINGS & CONNECTORS

A. Rigid Galvanized Steel and I.M.C. couplings and connectors shall be standard threaded type,
   galvanized outside and inside by hot dipping. Threadless and clamp type are not acceptable.
   Couplings/connectors shall be as manufactured by Raco, Efcor, or Appleton or equal.

B. All rain tight connectors shall be threaded Myers or approved equal, rated for outdoor
   application.

C. E.M.T. couplings and connectors shall be set screw, or steel compression type. All couplings
   and connectors shall be 720B, 730, 750B, or 760 series of Efcor or equal series of Raco.
   Pressure indented type connectors or cast metal will not be approved for any location. E.M.T.
   couplings and connectors shall be as manufactured by O-Z/Gedney, T&B, Efcor, Raco,
   Midwest or equal. E.M.T. fittings, couplings and connectors located within concrete (where
   allowed) shall be compression type and shall be adequately sealed with tape to ensure a
   concrete-tight seal.

D. Rigid Aluminum couplings and connectors shall be standard threaded type, of the same alloy as
   the associated conduit. Threadless and clamp type are not acceptable. Fittings shall be as
   manufactured by Thomas & Betts, Crouse-Hinds, Appleton, Pyle-National or equal.

E. All PVC couplings, adapters, end bells, reducers, etc., shall be of same material as conduit.

F. Liquidtight Flexible Metallic Conduit connectors shall be aluminum liquidtight with insulating
   throat or end bushing, designed for application with aluminum-core Liquidtight Flexible
   Metallic Conduit. Fittings shall be as manufactured by Efcor, Raco, Midwest or equal.

G. All LB unilets shall have rollers.

H. Miscellaneous conduit fittings shall be as manufactured by Appleton, Crouse-Hinds, Pyle-
   National, Russell & Stoll or equal.

2.3 BUSHINGS

A. All non-grounding rigid bushings 1-1/4” and larger shall be the insulating type (O-Z/Gedney
   type “BB” or equal by T&B, Midwest Electric or Penn Union).

B. All non-grounding rigid bushings 1” and smaller shall be threaded malleable iron with integral
   noncombustible insulator rated for 150°C. Non-grounding rigid conduit bushings shall be O-
   Z/Gedney type “B” or equal by T&B, Midwest Electric or Penn Union.
C. All grounding rigid bushings shall be threaded malleable iron with integral noncombustible insulator rated for 150°C. All grounding rigid conduit bushings shall be O-Z/Gedney type “BLG” or equal by T&B, Midwest Electric or Penn Union.

2.4 HARDWARE, CONDUIT CLAMPS AND SUPPORTS

A. All hardware such as expansion shields, machine screws, toggle bolts, “U” or “J” bolts, machine bolts, conduit clamps and supports shall be of corrosion resistant materials (stainless steel, aluminum, galvanized or plated steel, or other approved materials).

B. Hardware in contact with aluminum handrails, plates or structural members and all hardware in exterior, wet or corrosive areas shall be stainless steel or aluminum (with bitumastic paint coating to isolate aluminum from contact with concrete where necessary) unless specifically noted otherwise.

C. Supports in exterior, wet or corrosive locations shall be stainless steel or aluminum (with bitumastic paint coating to isolate aluminum from contact with concrete where necessary) unless specifically noted otherwise.

D. Supports in extremely corrosive environments (such as chlorine or fluoride storage rooms) shall be PVC-Coated steel unless specifically noted otherwise.

E. Hardware and conduit clamps shall be as manufactured by Efcor, Steel City, G.A., Tinnerman or equal.

2.5 WATERTIGHT ENTRANCE SEAL DEVICES

A. For new construction, seal devices shall consist of oversized sleeve and malleable iron body with sealing rings, pressure rings, sealing grommets and pressure clamps as required (O-Z/Gedney type FSK/WSK or equal).

B. For cored-hole applications, seal devices shall consist of assembled dual pressure disks with neoprene sealing rings and membrane clamps as required (O-Z/Gedney type CSM or equal).

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Minimum Diameter: 1/2-inch.

B. Raceway Type: Raceway types shall be as specified below, unless indicated otherwise on drawings:
   1. Exterior, Exposed: Rigid Galvanized Steel or I.M.C. unless otherwise noted.
   2. Other Exterior (Concrete-Encased or Direct Earth Buried): Schedule 40 PVC. PVC conduit shall convert to metallic conduit prior to exiting concrete-encasement or direct earth burial. See “transition” items below for additional requirements. Conduits shall be left exposed until after Architect’s observation.
   3. Interior, Exposed:
      a. Hazardous Locations: Rigid Galvanized Steel
b. Wet Locations (including, but not limited to, Pump Rooms, Wet Wells, Underground Vaults, and other similar locations): Rigid Galvanized Steel or I.M.C.
c. Dry Locations Where Subject to Mechanical Damage (including, but not limited to, below 10'-0" A.F.F. in shop, storage, warehouse and other similar areas): Rigid Galvanized Steel or I.M.C.
d. Extremely Corrosive Locations (Chlorine Storage Rooms, Fluoride Storage Rooms and other similar areas): Schedule 80 PVC.
e. Other Dry Locations: E.M.T.

4. Interior, Concealed:
   a. Embedded inside Poured Concrete Walls, Ceilings or Floors, with a minimum of 2" of concrete between finished surface and outer wall of conduit on all sides, where no anchor bolts, screws or other similar items will be installed: Schedule 40 PVC. PVC conduit shall convert to metallic conduit (exact type as specified elsewhere within this section) prior to exiting poured concrete-encasement of wall, ceiling, floor or ductbank. See “transition” items below for additional requirements.
   b. Other Raceways Embedded inside Poured Concrete Walls, Ceilings or Floors (not meeting requirements above): Rigid Galvanized Steel or I.M.C. (coated with two coats of asphaltum paint where below grade or within concrete).
   c. Other Raceways: E.M.T.

5. Terminations at motors, transformers and other equipment which has moving or vibrating parts:
   a. Exterior or Wet Locations (including, but not limited to, Pump Rooms, Wet Wells, Underground Vaults, and other similar locations): Aluminum-Core Liquidtight Flexible Metallic Conduit (shall generally not exceed 24 inches in length) with watertight fittings.
   b. Dry, Interior Locations: Flexible Metallic Conduit (shall generally not exceed 24 inches in length).

6. Terminations at fixtures mounted in grid-type ceilings:
   a. Flexible Metallic Conduit or MC cabling (shall generally not exceed 72 inches in length and shall run from junction box to fixture, not from fixture to fixture).

7. Transition from underground or concrete-encased to exposed:
   a. Convert PVC to Rigid Galvanized Steel (coated with two (2) coats of asphaltum paint) utilizing Rigid Galvanized Steel 90 degree bends (and vertical conduits as required by application) prior to exiting concrete/grade (except at outdoor pull boxes and under freestanding electrical equipment, where terminations shall be by PVC end bells installed flush with top of slab). Exposed portions of these coated conduits shall extend a minimum of 6” above floor level, and shall be installed at uniform heights.

3.2 RACEWAY INSTALLATION

A. General:
   1. Follow methods which are appropriate and approved for the location and conditions involved. Where not otherwise shown, specified, or approved in a particular case, run all wiring concealed.
   2. Where conduit crosses a structural expansion joint an approved conduit expansion fitting shall be installed.
   3. A #10 aluminum pull wire shall be installed in all empty conduits.
4. Metal conduit field-cuts shall be cut square with a hacksaw and the ends reamed after threading.
5. PVC conduit field-cuts shall be made with hacksaw, and ends shall be deburred.
6. All PVC joints shall be made as follows:
   a. Clean the outside of the conduit to depth of the socket, and the inside of socket with an approved cleaner.
   b. Apply solvent cement as recommended by the conduit manufacturer to the interior of the socket and exterior of conduit, making sure to coat all surfaces to be joined.
   c. Insert conduit into the socket and rotate 1/4 to 1/2 turn and allow to dry.
7. All metallic conduit installed below grade or within concrete shall be painted with two (2) coats of asphaltum paint prior to installation.
8. Install ground wire sized per N.E.C. Table 250.122 in all conduits.
9. Use of running threads is absolutely prohibited. Conduit shall be jointed with approved threaded conduit couplings. Threadless and clamp type not acceptable.
10. Conduits shall be sized in accordance with latest National Electrical Code except when size shown on drawings. 1/2-inch conduit shall not contain conductors larger than No. 12 or more than four (4) No. 12 conductors.
11. Exposed, field-cut threads on all metal conduits shall be painted with zinc primer (for Galvanized Rigid or I.M.C.).

B. Routing/Locating:
1. Exposed conduit runs shall be run level and plumb and shall, on interior of buildings, be run parallel and/or at right angles to building walls and/or partitions.
2. Conduit with an external diameter larger than 1/3 the thickness of a concrete slab shall not be placed in the slab. Conduits in slab shall not be spaced closer than 3 diameters on center.
3. Conduit run in ceiling spaces shall be run as high as possible, all at same level, and shall be supported from building structure. Do not support conduit from any other installation.
4. Install conduit runs to avoid proximity to steam or hot water pipes. In no place shall a conduit be run within 6” of such pipes except where crossing is unavoidable, then conduit shall be kept at least 3” from the covering of the pipe crossed.
5. Before installing raceways for motors, HVAC equipment and other fixed equipment, check location of all equipment connections/terminal boxes with equipment supplier and locate and arrange raceways appropriately.
6. A minimum of 12” of clearance shall be provided between the finished lines of exterior, underground conduit runs and exterior, underground utilities (gas, water, sewer, etc.).

C. Bends:
1. Do not make bends (in any raceway, including flexible conduits) that exceed allowable conductor bending radius of cable to be installed or that significantly restrict conductor flexibility.
2. All bends within concrete-encased ductbanks installed in exterior locations shall be long radius bends (24” minimum bending radius – varies with conduit diameter).
3. Where numerous exposed bends or grouped together, all bends shall be parallel, with same center and shall be similar in appearance.
4. All PVC elbows, bends, etc., shall be either factory bends or made with an approved heat bender.
D. Support:
1. Anchor conduit securely in place by means of approved conduit clamps, hangers, supports and fastenings. Arrangement and methods of fastening all conduits shall be subject to Engineer’s direction and approval. All conduits shall be rigidly supported (wire supports may not be used in any location). Use only approved clamps on exposed conduit.
2. Conduit in riser shafts shall be supported at each floor level by approved clamp hangers.
3. Right angle beam clamps and U bolts shall be specially formed and sized to snugly fit the outside diameters of conduits.
4. Where installed in seismic zones, suspended raceways shall be braced in two (2) directions as required to prevent swaying and excessive movement.

E. Terminations:
1. All conduit connections to sheet metal cabinets or enclosures located in exterior or wet locations shall terminate by use of rain tight hubs.
2. Where rigid or I.M.C. conduits enter sheet metal boxes, they shall be secured by approved lock nuts and bushings.
3. Where metal conduits enter outdoor pull boxes, manholes, under freestanding electrical equipment or other locations where direct metal-to-metal contact does not exist between enclosure and conduit, grounding bushings shall be installed. Each grounding bushing shall be connected to the enclosure ground and all other grounding bushings with properly sized grounding conductors.
4. Where E.M.T. enters sheet metal boxes they shall be secured in place with approved insulating fittings.
5. Where PVC enters outdoor pull boxes, manholes or under freestanding electrical equipment, PVC end bells shall be installed.
6. Conduit ends shall be carefully plugged during construction.
7. Permanent, removable caps or plugs shall be installed on each end of all empty raceways with fittings listed to prevent water and other foreign matter from entering the conduit system.

F. Penetrations:
1. All fire/smoke barrier penetrations shall be made in accordance with a U.L. listed assembly. Refer to drawings and other specifications for additional requirements.
2. All penetrations shall be at right angles unless shown otherwise.
3. Structural members (including footings and beams) shall not be notched or penetrated for the installation of electrical raceways unless noted otherwise without specific approval of the structural engineer.
4. Dry-packed non-shrink grout or watertight seal devices shall be used to seal openings around conduits at all penetrations through concrete walls, ceilings or aboveground floors.
5. All raceways entering structures shall be sealed (at the first box or outlet) with polyurethane grout compound that expands to form a flexible foam seal that prevents the entrance of gases or liquids from one area to another (Prime Resins Prime-Flex or equal).
6. All raceways passing through concrete roofs or membrane-waterproofed walls or floors shall be provided with watertight seals as follows:
   a. Where ducts are concrete encased on one side: Install watertight entrance seal device on the accessible side of roof/wall/floor as directed by equipment manufacturer.
   b. Where ducts are accessible on both sides: Install watertight entrance seal device on each side of roof/wall/floor as directed by equipment manufacturer.
7. All raceways passing through walls of rooms containing/storing noxious chemicals (chlorine, ammonia, etc.) or through hazardous locations shall be sealed with conduit seals (Crouse-Hinds type EYS or equal).

8. All raceways terminating into electrical enclosures/devices/panels/etc. located in hazardous locations shall be sealed with conduit seals (Crouse-Hinds type EYS or equal) within 18” of the termination.

G. Exterior Electrical Ductbanks:
1. Where exterior electrical concrete-encased ductbanks are indicated on drawings, conduit runs between buildings or structures shall be grouped in concrete-encased ductbanks as follows:
   a. A minimum of 3” of concrete shall encase each side of all ductbanks.
   b. A minimum of 1 ½” of separation shall be provided between each conduit within ductbanks. PVC spacers shall be installed at the necessary intervals prior to placement of concrete to maintain the required spacing and to prevent bending or displacement of the conduits.
   c. Top of concrete shall be a minimum of 30” below grade. A continuous magnetic marking tape shall be buried directly above each ductbank, 12” below grade.
   d. Exact routing of ductbanks shall be field verified and shall be modified as necessary to avoid obstruction or conflicts.
   e. Underground electrical raceways shall be installed to meet the minimum cover requirements listed in NEC Table 300.5. Refer to drawings for more stringent requirements.

END OF SECTION 16110
PART 1 - GENERAL

1.1 DESCRIPTION

A. Cables rated for 0V-50V application

PART 2 - PRODUCTS

2.1 GENERAL

A. Unless specified otherwise, all cables within the scope of this specification section shall:
   1. Be rated for exposed cable tray installation.
   2. Be plenum rated.
   3. Be UL-rated for the proposed application.
   4. Be multi-conductor with overall outer sheath as required by the application. The insulation of each conductor within the overall multi-conductor cable shall be uniquely color-coded. Ground conductors (when provided) within the multi-conductor cable shall have green insulation.
   5. Utilize copper conductors.
   6. Have wire gauge as required to limit voltage drop to acceptable limits determined by the system supplier and to meet all applicable code requirements.
   7. Where installed underground, within slab-on-grade or in exterior locations, be rated for wet locations.
   8. Where required for specific systems, meet the specific requirements (conductor quantity, wire gauge, insulation type, shielding, etc.) of the system supplier.

2.2 CLASS 1 CONTROL CABLEING (120VAC CONTROL CIRCUITS, ETC.)

A. In addition to above requirements, and unless specified otherwise, Class 1 control cabling shall:
   1. Be rated for 600V.
   2. Be industrial grade.
   3. Have stranded conductors.
   4. Have sunlight/oil-resistant PVC/Nylon insulation and jacket with ripcord.
   5. Be manufactured by Belden, AlphaWire or General Cable.

2.3 CLASS 2 & 3 CONTROL CABLEING (FED FROM CLASS 2 OR 3 POWER SUPPLIES)

A. In addition to above requirements, and unless specified otherwise, Class 2 & 3 control cabling shall:
   1. Be rated for 300V.
   2. Be shielded if so recommended by the system supplier/integrator.
   3. Have twisted conductors.
   4. Have plenum-rated insulation/jacket with ripcord.
   5. Be manufactured by AlphaWire, Belden, General Cable, Superior Essex or West Penn.

2.4 NETWORK CABLEING
A. Furnish and install all Ethernet, Fiber Optic and Backbone Copper Telephone cabling in accordance with all BICSI requirements and in accordance with other applicable specification sections.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Routing:
   1. All wires and cables shall be installed in conduit unless specifically noted otherwise. Where conduit is not otherwise required by contract documents, 0-50V Cabling located within concealed, accessible ceiling spaces (such as above lay-in ceilings) may be run without conduit if the following requirements are met:
      a. Cabling is plenum-rated, multi-conductor.
      b. Cabling is supported by cable tray or with J-hook supports on intervals not to exceed 5’-0” on center. Cabling shall be supported solely from the cable tray or j-hooks supported from the building structure, without using piping, ductwork, conduit or other items as supports.
      c. Cabling is neatly formed, bundled and tied with plenum-rated Velcro straps on intervals not to exceed 30” on center.
      d. Properly-sized conduit(s) are provided wherever cabling enters an inaccessible or exposed area (such as above gyp board ceilings, within walls or through walls).
      e. Cabling is not a part of a Fire Alarm System, Smoke Control System, Emergency Generator Control System or other life-safety related system.
   2. End bushings shall be provided on both ends of all raceway terminations.
   3. No splices shall be pulled into conduit.
   4. No cabling shall be pulled until conduit is cleaned of all foreign matter.

B. Penetrations:
   1. All fire/smoke barrier penetrations shall be made in accordance with a U.L. listed assembly.
   2. For cabling not installed in conduit:
      a. Fire/smoke barrier penetrations shall be sealed utilizing an enclosed fire-rated pathway device (STI EZ Path or equal) containing a built-in fire sealing system sufficient to maintain the hourly fire rating of the barrier being penetrated. The self-contained sealing system shall automatically adjust to the installed cable loading and shall permit cables to be installed, removed or retrofitted without the need to remove or reinstall firestop materials. The pathway shall be UL Classified and tested to the requirements of applicable ASTM/UL1479 standards.
   3. For cabling installed within conduit from endpoint to endpoint:
      a. Fire/smoke barrier penetrations shall sealed utilizing fire caulk or other equivalent firestop systems around perimeters of conduits per UL requirements.
   4. For cabling installed within cable trays:
      a. Fire/smoke barrier penetrations shall be sealed with one of the following methods:
         1) Continuous cable tray through the penetration, with a combination of large firestop pillows and small firestop pillows contained, supported and secured (to prevent unauthorized removal) on both sides by aluminum wire mesh and firestop putty.
Firestop pillows shall be STI Series SSB or equal and Firestop putty shall be STI Spec Seal or equal.

2) Cable tray broken at the penetration, with fire/smoke barrier penetrations sealed utilizing an enclosed fire-rated pathway device (STI EZ Path or equal) containing a built-in fire sealing system sufficient to maintain the hourly fire rating of the barrier being penetrated. The self-contained sealing system shall automatically adjust to the installed cable loading and shall permit cables to be installed, removed or retrofitted without the need to remove or reinstall firestop materials. The pathway shall be UL Classified and tested to the requirements of applicable ASTM/UL1479 standards.

C. Excess Cabling:
   1. Excess cabling shall be neatly coiled within all junction boxes, pullboxes, wireways, etc. and at all terminations as required to allow future re-termination of cabling.

D. Terminations:
   1. Cabling shall be neatly formed, bundled and tied at all terminations.

3.2 SPLICES/CONNECTIONS/TERMINATIONS:

A. Network Cabling:
   1. Network and fiber optic cabling shall be continuous from endpoint to endpoint and shall not be spliced unless specifically noted otherwise.

B. Control Cabling:
   1. Connections shall be made with T & B Sta-Kon wire joints EPT66M, complete with insulating caps. To be installed with WT161 Tool or C nest of WT11M Tool, Ideal Super - Nuts (not wire nuts), Ideal Wing Nuts, or Buchanan Elec. Products B Cap or Series 2000 Pressure connectors complete with nylon snap on insulators to be installed with C24 pressure tool.

C. Shielded cabling:
   1. Unless directed otherwise by the system supplier, 0-50V cable shielding shall be grounded at the PLC/control panel end only (not at the field device end) with a termination kit as directed by the PLC/control panel supplier.
   2. Shielded cabling shall be continuous from endpoint to endpoint and shall not be spliced without prior written approval from the Engineer.

3.3 LABELING

A. Refer to Specification Section 16075 for all labeling requirements.

END OF SECTION 16116
PART 1 - GENERAL

1.1 DESCRIPTION

A. Power Wires and Cables

B. Low Voltage Wires and Cables

PART 2 - PRODUCTS

2.1 POWER WIRES AND CABLES - 600 VOLT

A. General: Conductors shall have current carrying capacities as per N.E.C. and with 600 volt insulation, #12 minimum except for controls and fixture wire. Conductors shall be copper.

B. General Application (see below for exceptions):
   1. At or Below Grade (including within slab-on-grade):
      a. #8 or larger conductors: XHHW or RHH/RHW/USE stranded.
      b. #10 or smaller conductors for circuits terminating at motors: THHN/THWN or XHHW stranded.
      c. #10 or smaller conductors (excluding circuits terminating at motors): THHN/THWN or XHHW solid.
   2. Above Grade:
      a. #8 or larger conductors: THHN/THWN stranded.
      b. #10 or smaller conductors for circuits terminating at motors: THHN/THWN stranded.
      c. #10 or smaller conductors (excluding circuits terminating at motors): THHN/THWN solid.
      d. Contractor may use MC cabling for concealed branch circuits where supported in accordance with the NEC.
   3. Power Wire and cable shall be as manufactured by Southwire, Rome, American Insulated Wire, Okonite, Phelps-Dodge, Amercable, Aetna or approved equal.

C. Emergency Feeder Wiring
   1. Feeder-circuit wiring for emergency systems installed in spaces or areas not fully protected by an approved automatic fire suppression system shall be a listed electrical circuit protective system consisting of 2-hour fire-rated, mineral insulated, copper-sheathed wiring cable (Pyrotenax System 1850 or equal).

D. Class 1 Control Cabling (120VAC Control Circuits, Etc.)
   1. Unless specified otherwise, Class 1 control cabling shall:
      a. Be rated for exposed cable tray installation.
      b. Be plenum rated.
      c. Be UL-rated for the proposed application.
      d. Be multi-conductor with overall outer sheath as required by the application. The insulation of each conductor within the overall multi-conductor cable shall be uniquely
color-coded. Ground conductors (when provided) within the multi-conductor cable shall have green insulation.

e. Utilize copper conductors.

f. Have wire gauge as required to limit voltage drop to acceptable limits determined by the system supplier and to meet all applicable code requirements.

g. Where installed underground, within slab-on-grade or in exterior locations, be rated for wet locations.

h. Where required for specific systems, meet the specific requirements (conductor quantity, wire gauge, insulation type, shielding, etc.) of the system supplier.

i. Be rated for 600V.

j. Be industrial grade.

k. Have stranded conductors.

l. Have sunlight/oil-resistant PVC/Nylon insulation and jacket with ripcord.

2. Control cabling shall be as manufactured by Belden, AlphaWire or General Cable.

E. Fixture Wiring

1. Conductor Types:
   a. Type TFFN or XFF.

2. Minimum Sizes:
   a. For fixtures up to 300 watts: #16.
   b. For fixtures over 300 watts up to 1500 watts: #14.
   c. For fixtures over 1500 watts: as required.
   d. Conductors to concrete pour fixtures: #12.

3. Fixture wire shall extend only from fixture to first junction, and not over 6 feet, except for concrete pour units.

2.2 COPPER WIRE CONNECTIONS:

A. At Motor Connections (within motor terminal boxes):
   1. On Unshielded Wire:
      a. Single conductor per phase: shall be made with insulated set screw connectors or 3M 5300 Series 1kV Motor Lead Connections kits with mechanical lugs as required.
      b. Multiple conductors per phase: shall be made with insulated mechanical lugs, rated for the associated motor cable types, by Polaris or Ilsco.

2. On Shielded Power Wire:
   a. The braided shields and internal grounding conductors of shielded power (not instrumentation) cables shall be grounded at BOTH ends (at VFD/starter and at motor) with a termination kit provided by the cable supplier. This termination kit shall include a connection ring that makes contact around the full circumference of the braided shield, and connects all internal grounds to a common external ground point.

B. Other Dry locations:
   1. On Wire larger than #10: shall be made with solderless, non-insulated compression-type connectors meeting requirements of Federal Specification WS-610e for Type II, Class 2 and shall be covered with Scotch #33 electrical tape so that insulation is equal to 150% of conductor insulation.
   2. On Wire #10 and smaller: shall be made with one of the following:
      a. Ideal Wing Nuts or equal by 3M.
      b. Ideal Push-In Wire Connectors (for #12 and smaller only).
C. Other Wet/Damp locations:
   1. On Wire larger than #10: shall be made with solderless, non-insulated compression-type connectors meeting requirements of Federal Specification WS-610e for Type II, Class 2 and shall be covered with Scotch #33 electrical tape so that insulation is equal to 150% of conductor insulation.
   2. On Wire #10 and smaller: shall be made with one of the following:
      a. Ideal Weatherproof or Underground Wire Connectors pre-filled with 100% silicone sealant as required by the application.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. All wires and cables shall be installed in conduit unless specifically noted otherwise.

B. All joints and splices on wire shall be made with solderless connectors, and covered so that insulation is equal to conductor insulation.

C. No splices shall be pulled into conduit.

D. No conductor shall be pulled until conduit is cleaned of all foreign matter.

E. Wire and cable shall be neatly formed, bundled and tied in all panelboards, wireways, disconnect switches, pullboxes, junction boxes, cabinets and other similar electrical enclosures.

F. All wires and cables installed in underground or other wet locations shall be rated by the manufacturer for wet locations.

G. Network cabling shall be continuous from endpoint to endpoint and shall not be spliced unless specifically noted otherwise.

3.2 POWER WIRE AND CABLE INSTALLATION:

A. No power conductor shall be smaller than #12 except where so designated on the drawings or hereinafter specified.

B. Multi-wire lighting branches shall be used as indicated.

C. Where more than three current-carrying conductors are installed in a single raceway or cable, conductors shall be derated as indicated in NEC Table 310.15(B)(2)(a).

D. In installing parallel power conductors, it is mandatory that all conductors making up the feeder be exactly the same length, the same size, the same type of conductor with the same insulation. Each group of conductors making up a phase or neutral must be bonded at both ends in an approved manner.

E. In installing overhead main power services, a minimum of 5’-0” of cable per run shall be extended beyond the weatherhead(s) for connection to service drop.

3.3 WIRE CONNECTIONS
A. See Part 2 above for material types.

B. Aluminum Wire Connections:
   1. Where aluminum wiring is allowed, connections shall utilize compression fittings, no exceptions (Anderson Versa Crimp or equal).

C. Any stranded wire connection to wiring devices shall be made with crimp type terminals.

D. All electrical connections and terminals shall be tightened according to manufacturer’s published torque-tightening values with calibrated torque wrenches as required to clearly indicate final torque value to the contractor. Where manufacturer’s torque values are not provided, those specified in UL 486A & 486B shall be used.

E. All connections and connector types shall be installed in strict compliance with all requirements of the connector manufacturer.

3.4 LOW VOLTAGE (LESS THAN 50V) CONTROL AND NETWORK CABLE INSTALLATION:

A. All wires and cables shall be installed in conduit unless specifically noted otherwise. Low voltage control and/or network cabling located within concealed, accessible ceiling spaces (such as above lay-in ceilings) may be run without conduit if the following requirements are met:
   1. Cabling shall be plenum-rated, multi-conductor.
   2. Cabling shall be supported by cable tray or with J-hook supports on intervals not to exceed 5'-0” on center. Cabling shall be supported solely from the cable tray or j-hooks supported from the building structure, without using piping, ductwork, conduit or other items as supports.
   3. Cabling shall be properly bundled with plenum-rated Velcro straps on intervals not to exceed 30” on center.
   4. Properly-sized conduit(s) shall be provided wherever cabling enters an inaccessible or exposed area (such as above gyp board ceilings or through walls). End bushings shall be provided on both ends of all raceway terminations. All fire/smoke barrier penetrations shall be made in accordance with a U.L. listed assembly.

3.5 CIRCUITS AND BRANCH CIRCUITS

A. Outlets shall be connected to branch circuits as indicated on drawings by circuit number adjacent to outlet symbols, and no more outlets than are indicated shall be connected to a circuit.

3.6 LABELING AND COLOR CODING OF WIRE AND CABLE

A. Refer to Specification Section 16075 for all labeling requirements.

B. A color coding system as listed below shall be followed throughout the network of branch power circuits as follows:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>120/208/240/</th>
<th>120/240 HIGH LEG</th>
<th>277/480 VOLT</th>
</tr>
</thead>
<tbody>
<tr>
<td>COLOR</td>
<td>DELTA COLOR</td>
<td>COLOR</td>
<td></td>
</tr>
</tbody>
</table>
C. Where dedicated neutrals are installed for multi-wire branch circuits, the neutral conductors shall be color coded as follows:

<table>
<thead>
<tr>
<th>PHASE</th>
<th>120/208/240/277/480 VOLT</th>
<th>120/240 HIGH LEG DELTA COLOR</th>
<th>277/480 VOLT COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEUTRAL A</td>
<td>WHITE W/ BLACK TRACER</td>
<td>WHITE W/ BLACK TRACER</td>
<td>GRAY W/ BROWN TRACER</td>
</tr>
<tr>
<td>NEUTRAL B</td>
<td>WHITE W/ RED TRACER</td>
<td>WHITE W/ ORANGE TRACER (FOR HI-LEG NEUTRAL)</td>
<td>GRAY W/ ORANGE TRACER</td>
</tr>
<tr>
<td>NEUTRAL C</td>
<td>WHITE W/ BLUE TRACER</td>
<td>WHITE W/ BLUE TRACER</td>
<td>GRAY W/ YELLOW TRACER</td>
</tr>
</tbody>
</table>

D. Control Conductors: Shall be color coded by use of colored “tracers”. No control circuit shall contain two identical conductors. For example, a set of five (5) control conductors for a pushbutton station represents one (1) control circuit which would require five (5) uniquely-colored control conductors.

3.7 TESTING

A. The insulation resistance of all feeder conductors (feeding electrical distribution equipment such as switchboards, panelboards, transfer switches, transformers, etc.) shall be tested at the load side of the feeder breaker with a 500-volt DC Megger Tester. Any feeder conductor with an insulation resistance less than 1 Mega ohm to ground shall be replaced by the contractor at the contractor’s expense. All final test results shall be clearly documented (with date, time, feeder, results, test equipment, etc.), and the final test results shall be submitted to the design team for review.
SECTION 16130

OUTLET BOXES, JUNCTION BOXES, WIREWAYS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Outlet and Junction Boxes
B. Pull Boxes
C. Wireways

PART 2 - PRODUCTS

2.1 OUTLET BOXES & JUNCTION BOXES (THROUGH 4-11/16”)

A. Sheet Metal: Shall be standard type with knockouts made of hot dipped galvanized steel as manufactured by Steel City, Raco, Appleton, Bowers or equal.

B. Cast: Shall be type FS, FD, JB, GS, or SEH as required for application as manufactured by O-Z/Gedney, Appleton, or equal.

C. Nonmetallic: Shall be type Polycarbonate/ABS construction as required for application with non-metallic quick-release latches as manufactured by Hoffman, O-Z/Gedney, Appleton, or equal.

2.2 JUNCTION AND PULL BOXES (LARGER THAN 4-11/16”)

A. Oil-Tight JIC: Shall be Hoffman Type CH box or approved equal.

B. Galvanized Cast Iron or Cast Aluminum: Shall be O-Z/Gedney or approved equal.

C. Stainless Steel: Shall be as manufactured by O-Z/Gedney, Hoffman or approved equal.

D. Nonmetallic: Shall be type Polycarbonate/ABS construction as required for application with non-metallic quick-release latches as manufactured by Hoffman, O-Z/Gedney, Appleton, or equal.

E. Wireways: Shall be standard manufacturer’s item as manufactured by Hoffman, Square “D”, Burns, B & C or equal.

F. Pre-cast Polymer Concrete Below-Grade Hand Holes & Pull Boxes:
   1. Enclosures, boxes and cover are required to be UL Listed and conform to all test provisions of ANSI/SCTE 77 “Specifications For Underground Enclosure Integrity” for Tier 15 applications (15,000lb design load and 22,500lb test load) unless noted otherwise.
   2. All covers shall have a minimum coefficient of friction of 0.05 in accordance with ASTM C1028 and the corresponding Tier level shall be embossed on the top surface.
3. Cover shall be bolt-down include factory-labeling to read “Electric”, “Communications” or other as directed.
4. Hardware shall be stainless steel.
5. Shall be Quazite PG/LG Style or approved equal.

G. Galvanized Cast Iron Below-Grade Pull Boxes:
   1. Enclosures, boxes and cover are required to conform to AASHTO H-20 requirements for deliberate vehicular traffic applications unless noted otherwise.
   2. Cover shall be checkered, bolt-down include factory-labeling to read “Electric”, “Communications” or other as directed.
   3. Hardware shall be stainless steel.
   4. Shall be furnished with grounding kit.
   5. Shall be O-Z/Gedney Type YR or approved equal.

1) PART 3 - EXECUTION

3.1 APPLICATION

A. General
   1. All boxes and wireways shall be of sufficient size to provide free space for all enclosed conductors per NEC requirements. Fill calculations shall be performed by contractor per NEC requirements.

B. Outlet Boxes & Junction Boxes (through 4-11/16”)
   1. Sheet metal boxes shall be used on concealed work in ceiling or walls and exposed work in dry, interior locations.
   2. Cast boxes shall be used wherever Rigid or I.M.C. conduits are installed.
   3. All boxes installed in extremely corrosive areas (such as chlorine and fluoride storage rooms) where non-metallic raceways are used shall be non-metallic.
   4. Except when located in exposed concrete block, switch and receptacle boxes shall be 4” square for single gang installation. Appropriate gang boxes shall be used for mounting ganged switches.
   5. When installed in exposed concrete block, switch and receptacle boxes shall be square type designed for exposed block installation.
   6. Ceiling outlet boxes shall be 4” octagon 1-1/2” deep or larger required due to number of wires.

C. Junction & Pull Boxes (larger than 4-11/16”)
   1. For all below grade exterior use and elsewhere as shown:
      1) In areas subject to future vehicular traffic: shall be galvanized cast iron (rated AASHTO H-20 Loading unless noted otherwise).
      2) In areas not subject to vehicular traffic: shall be galvanized cast iron or pre-cast polymer concrete (rated for Tier 15 Loading unless noted otherwise).
   2. All boxes installed exposed in exterior or wet areas shall be powder-coated galvanized steel (NEMA 3R).
   3. All boxes installed exposed in corrosive areas shall be stainless steel (NEMA 4X).
4. All boxes installed in extremely corrosive areas (such as chlorine and fluoride storage rooms) where non-metallic raceways are used shall be non-metallic.

5. All others shall be oil tight JIC box not less than 16 gauge.

3.2 INSTALLATION

A. General
1. All boxes and wireways shall be securely anchored.
2. All boxes shall be properly sealed and protected during construction and shall be cleaned of all foreign matter before conductors are installed.
3. All boxes and wireways shall be readily accessible. Contractor shall be responsible for furnishing and installing access panels as directed by the architect as required to make boxes and wireways accessible where above gypsum board ceilings or in other similar locations.
4. All metallic boxes and wireways shall be properly grounded.
5. Refer to Specification Section 16075 for identification requirements.

B. Outlet Boxes & Junction Boxes (through 4-11/16”)
1. Boxes shall be provided with approved 3/8” fixture studs were required.
2. Recessed boxes for wiring devices, surface fixtures, or connections, shall be set so that the edge of cover comes flush with finished surface.
3. There shall be no more knockouts opened in any sheet metal box than actually used.
4. Any unused opening in cast boxes shall be plugged.
5. Back to back boxes to be staggered at least 3 inches.
6. Under no circumstances shall through-the-wall boxes be used.

C. Junction & Pull Boxes (larger than 4-11/16”)
1. Pull boxes shall be installed as indicated on plans and/or as required due to number of bends, distance or pulling conditions.
2. Boxes to be imbedded in concrete shall be properly leveled and anchored in place before the concrete is poured.
3. All pull boxes and/or junction boxes installed exterior below grade, shall have their tops a minimum of 1-1/2 inches above surrounding grade and sloped so that water will not stand on lid. A positive drain shall be installed, to prevent water accumulation inside.
4. Above grade pull boxes shall be installed on concrete anchor bases as shown on Plans.

D. Wireways and/or wall-mounted equipment
1. Mount each wireway to channels of the same metal type as the wireway.
2. Conductors serving a wireway shall be extended without reduction in size, for the entire length of the wireway. Tap-offs to switches and other items served by the wireway shall be made with ILSCO type GTA with GTC cap.

END OF SECTION 16130
PART 1 - GENERAL

1.1 DESCRIPTION

A. Wiring Devices
B. Plates
C. Finishes

PART 2 - PRODUCTS

2.1 WIRING DEVICES AND PLATES

A. Switches shall be AC type, extra-heavy duty industrial grade (unless otherwise shown) of ratings shown on drawings. Switches shall be as manufactured by Hubbell, P & S, Sierra, Bryant, GE, Arrow Hart or equal.

B. Receptacles shall have blade configuration and shall be extra-heavy duty industrial grade (unless otherwise shown) of current and voltage rating as shown on drawings. Receptacles shall be as manufactured by Hubbell, P & S, Sierra, Bryant, GE, Arrow Hart or equal.

C. Each wiring device shall have a plate (see “Finishes” section below for specific requirements).

2.2 FINISHES

A. All wiring devices (switches, receptacles, etc.) shall be colored to match the coverplates described below. For instance, all items covered by stainless steel, aluminum or malleable iron plates shall be gray in color.
   1. Exceptions:
      a. Emergency wiring devices shall be red.
      b. Isolated ground wiring devices shall be orange.

B. Coverplates for recessed, wall-mounted electrical items (switches, receptacles, telephone outlets, etc.) shall be stainless steel unless shown otherwise.

C. Coverplates, trim rings, etc. for recessed, floor-mounted electrical items (floor outlets, underfloor duct junctions, etc.) shall match finish of building hardware (302/304 stainless steel, brass, etc.) in area installed.

D. Coverplates for exposed electrical items (switches, receptacles, telephone outlets, etc.) shall be of same material as exposed boxes (see Outlet Box Specification for required material type) and shall have beveled edges.

E. Coverplates for receptacles in wet locations shall be metallic, in-use type, rated for wet
locations per NEC requirements unless noted otherwise.

F. See “Electrical Identification” specification section for coverplate labeling requirements.

PART 3 - EXECUTION

3.1 GENERAL MOUNTING

A. Symbols on drawings and mounting heights are approximate. The exact locations and mounting heights shall be determined on the job, and it shall be the Contractor's responsibility to coordinate with all trades to secure correct installation. For example, Contractor shall coordinate exact mounting heights over counters, in or above backsplashes, in block walls, and at other specific construction features.

B. Verify all door swings with Architectural. Locate boxes for light switches within four inches of door trim on swing side (not hinge side) of door.

C. Devices and associates plates shall not be used as support; outlet boxes shall be rigidly supported from structural members.

D. Mount all receptacles vertical with ground pole down.

E. Unless otherwise shown or required by local handicap codes, centerline of outlet boxes shall be the following distances above the finished floor unless otherwise noted.
   1. Receptacles and telephone outlets in offices and other finished areas: 1’-6”
   2. Receptacles and telephone outlets in equipment rooms and other unfinished areas: 4’-0”
   3. Receptacles over counters: As Noted
   4. Clock outlet, general: 7’-6”
   5. Switches, general: 4’-0”
   6. Bell outlets, interior, general: 7’-6”
   7. Bell outlets, exterior, general: 10’-0” or 1’-0” below roof line, whichever is lower.
   8. Fire Alarm Pull Stations: 4’-0”
   10. Push-button, etc., general: 4’-0”

END OF SECTION 16140
SECTION 16289

SURGE PROTECTIVE DEVICES

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 field-mounted SPDs for low-voltage (<1000 V) power distribution and control equipment.

B. The specified unit(s) shall provide effective high energy transient voltage surge suppression, surge current diversion and high frequency noise attenuation in all electrical modes for equipment connected downstream from the facility’s meter or load side of the main overcurrent device. The unit(s) shall be connected in parallel with the facility’s wiring system.

C. The unit(s) shall be designed and manufactured in North America by a qualified manufacturer of suppression filter system equipment. The qualified manufacturer shall have been engaged in the commercial design and manufacturer of such products for minimum of ten (10) years.

D. All products that are submitted according to these specification will be required to meet this specification in it’s entirety for both service and distribution TVSS systems. Any product that is submitted and does not comply with all parts of this specification will be subject to rejection.

1.3 DEFINITIONS

A. VPR: Voltage Protection Rating.

B. SPD: Surge Protective Device(s)

C. I(o): Nominal Discharge Current

1.4 SUBMITTALS

A. See specification section 16050.

B. Product Data: For each type of product indicated. Include:

C. Maximum Single Impulse Surge Current Rating.

D. Surge Life (Repetitive Surge) Rating.


F. UL1449 Third Edition Nominal Discharge Current (In).
G. Product dimensions and weights.
H. Furnished specialties and accessories.
I. Qualification Data:
J. Safety Agency File Number.
L. ISO 1401-2001 Certification.
M. Operation and Maintenance Data: For SPDs to include all submittal data and any applicable operation and maintenance manuals.
N. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE
A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a testing agency, and marked for intended location and application.
B. The unit shall be UL 1449 Listed and CUL Approved as a Surge Protective Device and UL 1283 Listed as an Electromagnetic Interference Filter
C. Provide 2nd party certified data demonstrating SPD response to ANSI/IEEE C62.41.2-2002 standard waveforms when tested according to IEEE C62.45.
D. Comply with NFPA 70.
E. All SPDs provided within this project at the service entrance, distribution panels, and sub-panels shall be from the same manufacturer.

1.6 PROJECT CONDITIONS
A. Service Conditions: Rate SPDs for continuous operation under the following conditions unless otherwise indicated:
1. Maximum Continuous Operating Voltage: Not less than 115 percent of nominal system operating voltage.
2. Operating Temperature: 30 to 150 deg F.
3. Humidity: 0 to 95 percent, non-condensing.
4. Altitude: Less than 13,000 feet above sea level.

1.7 COORDINATION
A. Where field-mounted SPD’s are specifically shown on plans, coordinate locations of field-mounted SPDs to allow adequate clearances for maintenance.

1.8 WARRANTY
A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or
replace components of surge suppressors that fail in materials or workmanship within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.

1.9 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Replaceable Protection Modules: 1 of each size and type installed, where field-replaceable modular SPDs are provided.
2. Fuses: 1 of each size and type installed, where field-replaceable fuses are provided.

PART 2 - PRODUCTS

2.1 SURGE PROTECTIVE DEVICES

A. Manufacturer:

B. Integral Devices: Surge Protective Devices shall be as manufactured by the distribution equipment manufacturer (Square D, etc.), or by Surge Suppression Inc. if all of the performance of this specification are met and all UL listing of the equipment manufacturer are met.

C. External Devices (where specifically specified on plans): Surge Protective Devices shall be as manufactured by the distribution equipment manufacturer (Square D, etc.) or Surge Suppression Inc.

D. Each Surge Protective Device shall:
1. Be internal to the associated distribution equipment (without violating any applicable UL listings) unless specifically shown otherwise on plans.
2. Be UL 1449 3rd edition listed.
3. Have short-circuit current rating complying with UL 1449 3rd edition, that matches or exceeds the short-circuit rating of the associated distribution equipment.
4. Be designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.
5. Have fuses, rated at 200-kA interrupting capacity.
6. Have a minimum UL 1449 Nominal Discharge Current (Iₙ) Rating of 20kA.
7. Be fabricated using bolted compression lugs.
8. Provide suppression for all ten (10) modes of protection.
9. Have LED indicator lights for power and protection status of each phase.
10. Have audible alarm, with silencing switch, to indicate when protection has failed.
11. Have form-C contacts rated at 2 A and 24-V ac minimum, one normally open and one normally closed, for remote monitoring of protection status. Contacts shall reverse on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with facility monitoring and control system if monitoring by that system is required by plans or other specifications.
12. Have six-digit transient-event counter, mounted to front of equipment door, set to totalize transient surges (externally mounted SPD’s may have the transient –event counter monted on the visible face of the SPD).
13. Meet all UL 96A requirements (for Lightning Protection Systems) where the device is installed at a service entrance of the facility. At a minimum, these devices shall:
14. Be marked as Type 1 or Type 2 SPDs with product Identity consisting of “Surge Protective Device” or “SPD”, and identifying all ratings so required by UL96A and the 4 digit alpha numeric Control Number.
15. Have a minimum UL 1449 Nominal Discharge Current ($I_n$) Rating of 20kA.
16. Be UL listed and labeled with holographic label.

E. Peak Single-Impulse Surge Current Rating shall be meet the following minimums unless specifically shown otherwise on plans:

<table>
<thead>
<tr>
<th>Application</th>
<th>Per Phase</th>
<th>Per Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Entrance Devices</td>
<td>240 kA</td>
<td>120 kA</td>
</tr>
<tr>
<td>Downstream Devices</td>
<td>160 kA</td>
<td>80 kA</td>
</tr>
</tbody>
</table>

F. The ANSI/UL 1449 voltage protection rating (VPR) in grounded wye circuits, the SPDs shall not exceed the following:

<table>
<thead>
<tr>
<th>Modes</th>
<th>208Y/120V</th>
<th>480Y/277V</th>
<th>600Y/347V</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-N,L-G, N-G</td>
<td>800</td>
<td>1200</td>
<td>1500</td>
</tr>
<tr>
<td>L-L</td>
<td>1200</td>
<td>2000</td>
<td>2500</td>
</tr>
</tbody>
</table>

G. The ANSI /UL 1449 VPR for 240/120 V, 3-wire or 4-wire circuits with high leg shall not exceed the following:

<table>
<thead>
<tr>
<th>Modes</th>
<th>240/120V</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-N,L-G, N-G</td>
<td>1200/800</td>
</tr>
</tbody>
</table>

2.2 ENCLOSEMENTS

A. Where external units are specifically specified on plans, units not mounted within electrical distribution equipment (such as switchboards, MCC’s, etc.) shall be provided in enclosures with NEMA enclosure ratings that match or exceed the NEMA enclosure ratings of the equipment from which the units are fed. For example, a unit fed from a NEMA 4X stainless steel panelboard shall also be mounted within a NEMA 4X stainless steel enclosure.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All SPD’s shall be integrally-mounted within the associated distribution equipment unless specifically shown otherwise on plans.

B. Install SPDs at service entrance on load side, with ground lead bonded to service entrance
C. Install SPDs downstream of the service entrance with conductors or buses between suppressor and points of attachment as short and straight as possible. The lead lengths between the TVSS unit and the equipment being protected shall not exceed fourteen (14) inches without approval from the engineer. Do not bond neutral and ground. Leads shall be as straight as possible with no sharp bends.

D. Where externally-mounted SPD’s are specifically shown on plans, provide circuit breaker as directed by the SPD supplier as a dedicated disconnecting means for SPD unless otherwise indicated.

3.2 FIELD QUALITY CONTROL

A. Ensure that interiors are free of foreign materials and dirt.

B. Check and test switches, pushbuttons, meters for proper operation.

C. Check and test indicating lights for proper operation and color.

D. Perform manufacturer's on site field test procedures.

3.3 STARTUP SERVICE

A. Do not perform insulation resistance (MEGGER) tests of the distribution wiring equipment with the SPDs installed. Disconnect all wires, including neutral, before conducting insulation resistance tests, and reconnect immediately after the testing is over.

3.4 SYSTEM WARRANTY

A. The SPD system manufacturer shall warranty the entire SPD system against defective materials and workmanship for a period of ten (10) years from the date of substantial completion. This warranty is in effect as long as the unit is installed in compliance with the manufacturer's installation, operation, and maintenance manual, UL Listing requirements, and any applicable national or local electrical codes.

B. Any SPD device which shows evidence of failure or incorrect operation, including damage as the result of lightning strikes, during the warranty period shall be replaced by the manufacturer at no charge to the owner. Warranty will provide for multiple exchanges of any inoperable devices at any time during the warranty period which starts at the date of substantial completion of the system to which the surge suppressor is installed.

C. The manufacturer is required to have a nationwide network of factory-authorized local service representatives for repair and service of this product. The manufacturer shall have a dedicated 1-800 telephone number for service problems and questions. This number shall be manned by a knowledgeable factory employee to ensure prompt response to any emergency situation that may arise.

END OF SECTION 16289
SECTION 16410

SAFETY SWITCHES AND FUSES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Safety Switches
B. Fuses
C. Branch Feeders
D. Feeders

PART 2 - PRODUCTS

2.1 SAFETY SWITCHES

A. Safety switches shall be quick-make, quick-break, NEMA heavy duty type HD, fused or nonfused as shown. Switch blades shall be fully visible in the off position.

B. Safety switches shall be furnished with transparent internal barrier kits to prevent accidental contact with live parts. Barriers shall provide finger-safe protection when the switch door is open and shall allow use of test probes and removal of fuses without removing barrier.

C. Fused switches shall have provisions for class R, rejection type fuses.

2.2 FUSES (600V)

A. Fuses for all branch switches shall be Bussman Mfg. Co., Dual Element, Class “R” Fusetron.

B. Fuses for main switch/switches shall be Bussman Mfg. Co. Hi-Cap.

2.3 MANUFACTURER

A. Safety switches shall be as manufactured by Square ’D’, G.E., Siemens or Cutler Hammer.

B. Fuses shall be as manufactured by Bussman Mfg. Co. or equal.

PART 3 - EXECUTION

3.1 SAFETY SWITCHES

A. Safety switches shall be installed as shown on the plans and in accordance with N.E.C.

B. Locations shown for safety switches on plans are diagrammatical only. Exact locations shall be field coordinated by contractor as required to provide code-required clearances.
C. Switch enclosures shall be rated NEMA I indoors in dry locations and NEMA3R outdoors and in wet areas.

D. Adequate support shall be provided for mounting safety switches. Safety switches shall not be mounted to the associated equipment (unless the safety switch is furnished with the equipment).

3.2 FUSES

A. Fuses shall be sized as shown on drawings, unless a smaller size is required by the associated equipment supplier, in which case the contractor shall provide fuses sized as directed by the associated equipment supplier at no additional cost.

B. Provide not less than one spare set of fuses for each size used. Provide an additional spare set for each five sets of same size fuses used.

END OF SECTION 16410
SECTION 16441

POWER PANELBOARDS - CIRCUIT BREAKER TYPE

PART 1 - GENERAL

1.1 GENERAL

A. The work under this section includes but is not limited to the following:
   1. Power Panelboards
   2. Power Circuit Breakers

PART 2 - PRODUCTS

2.1 PANELBOARDS - GENERAL

A. Panelboards shall be dead front type, having lugs only or circuit breaker in mains as shown in panelboard schedule with circuit breaker branches.

B. Panelboard bus structure and main lugs or main breaker shall have current ratings as shown on plans. Such rating shall be established by heat rise test with Maximum hot spot temperature on any connector or bus bar not to exceed 50 degrees C rise above ambient at full rated load. Heat rise test shall be conducted in accordance with UL Standard UL67. Bus structure shall be tin-plated aluminum or tin-plated copper. All neutral busses shall be full size. All panelboards shall contain ground buss.

C. Entire panelboard assembly, including all bussing, shall have SCCR ratings meeting or exceeding the minimum AIC ratings listed on the plans for the panel. All ratings shall be full ratings. Series ratings will not be allowed unless shown otherwise on drawings.

D. Panelboards shall be listed by Underwriters Laboratories and shall bear the UL label. Panelboards shall be suitable for use as service equipment when required.

E. Top/bottom feed arrangement and lug sizes/quantities shall be coordinated by the contractor.

2.2 CIRCUIT BREAKERS

A. Circuit breakers shall be quick-make and quick-break, whether actuated automatically or manually. Circuit breakers shall be thermal magnetic with inverse time tripping characteristics with automatic release secured through action of a combination thermal-magnetic trip element which shall trip free of the handle. Circuit breaker handles shall be three distinct positions—“OFF”, “ON”, and “TRIPPED”. When a circuit breaker opens on overload or short circuit, the operating handle shall automatically assume the “TRIPPED” position.

B. Multipole breakers shall be internal common trip with single operating handle. External handle ties are not acceptable, unless specifically noted otherwise (such as for multi-wire branch circuits described below).

C. Circuit breakers feeding multiwire branch circuits (as defined by NEC) consisting of separate
single phase loads sharing a common neutral shall be provided with handle ties to
simultaneously disconnect all ungrounded conductors per NEC Article 210.4(B). The
necessary locations of these handle ties shall be coordinated by the contractor. Where
necessary, the contractor may rearrange circuit breakers (as minimally as possible) as required
to meet this requirement.

D. Circuit breakers shall be of the bolt-on type.

E. Circuit breakers shall be “FA” frame and larger.

F. All breakers shall meet the minimum RMS symmetrical interrupting capacity ratings shown on
plans for the associated panel. All interrupting ratings shall be full ratings. Series ratings will
not be allowed unless shown otherwise on drawings.

G. The front face of all circuit breakers shall be flush with each other. Breaker numbers shall be
permanently attached to trim.

H. All branch circuit breakers shall be listed to UL489 or shall be specially-tested to be HACR
listed.

2.3 CABINETS, TRIM AND WIREWAY SPACE

A. Clear space from bottom of lugs to bottom of wireway shall be not less than 6 inches for 400
amps and below, 10 inches for 600 amps, 12 inches for 800 amps and above.

B. Panelboard interiors shall be fastened to cabinets by adjustable aligning supports.

C. Panelboard assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel to be
as specified in UL Standard 50 for cabinets. Single section cabinets shall not exceed 72 inches
in height.

D. Fronts of cabinets shall be made from a single sheet of full finished steel having the door cut
out. Doors shall have flush hinges, and lock utilizing all metal construction (with all locks
keyed alike). Front shall be attached to cabinets with hinged trim with piano-hinge down full
length of one side to allow access to wiring without complete removal of outer trim. Front
shall be provided with a metal directory and holder with clear plastic covering welded to the
inside of the door. Fronts shall be code gauge full-finished steel with rust inhibiting primer and
baked enamel finished in ASA #49 gray. Panelboards installed in exterior or wet locations
shall have NEMA 3R enclosures.

E. Each section of multi-section panelboards shall be of matching heights and depths.

F. Panelboard enclosures shall be furnished as shown on panel schedule on plans for surface, flush
or motor control center mounting.

2.4 MANUFACTURER

A. Panelboards shall be as manufactured by Square ‘D’, G.E., Siemens or Cutler Hammer.
PART 3 - EXECUTION

3.1 INSTALLATION

A. All panelboard dimensions and clearances shall be carefully checked and coordinated with the proper trades to insure proper mounting space and support prior to roughing in equipment. In no case shall any circuit breaker be located above 6'-7" A.F.F..

B. Wiring in panelboard gutters shall be done in a neat and workmanlike manner. Wiring shall be grouped into neat bundles and secured with approved tie wraps.

3.2 PANEL IDENTIFICATION

A. Refer to Specification Section 16075.

END OF SECTION 16441
SECTION 16442
LIGHTING PANELBOARDS

PART 1 - GENERAL

1.1 GENERAL

A. The work under this section includes but is not limited to the following:
   1. Lighting Panelboards
   2. Circuit Breakers

PART 2 - PRODUCT

2.1 PANELBOARDS

A. Enclosure:
   1. Panelboards shall be dead front type and shall be in accordance with Underwriter’s Laboratories, Inc., standard of panelboards and enclosing cabinets and so labeled.
   2. Panelboard boxes shall be fabricated from sheet steel and shall be finished in ASA #49.
   3. The door shall have a cylinder type lock. Lock shall be held in place by concealed screw to a captive nut, welded to inside of door. All locks shall be keyed alike.
   4. A metal framed circuit directory card holder with clear plastic covering shall be factory-mounted on the inside of door.
   5. Panels for 20 or more circuits, including spares and spaces, shall be 20 inches wide.
   6. Panelboards enclosures shall be as shown on panel schedule on plans for surface, flush or motor control center mounting.
   7. Provide hinged trim with piano-hinge down full length of one side to allow access to wiring without complete removal of outer trim.
   8. Each section of multi-section panelboards shall be of matching heights and depths.

B. Bussing/Lugs:
   1. Ampacity and service voltage of main buss, lugs or main breakers and branch circuit breakers shall be as shown on drawings.
   2. All bussing and associated connectors shall be tin-plated aluminum or tin-plated copper.
   3. All panelboards shall contain ground buss.
   4. Entire panelboard shall be capable of withstanding a short circuit not less than the interrupting capacity of any breaker in the panel. Interrupting ratings shall be full ratings. Series ratings will not be allowed unless shown otherwise on drawings.
   5. Buss connectors shall be for distributed phase arrangement.
   6. Top/bottom feed arrangement and lug sizes/quantities shall be coordinated by the contractor.
   7. Entire panelboard assembly, including all bussing, shall have SCCR ratings meeting or exceeding the minimum AIC ratings listed on the plans for the panel. All ratings shall be full ratings. Series ratings will not be allowed unless shown otherwise on drawings.

C. Breaker arrangement and numbering:
1. Panelboards shall be factory assembled with branch breakers arranged exactly as indicated on plans.
2. Breakers shall be numbered vertically beginning top left. Multi-section panelboards shall be numbered consecutively through all sections.
3. Breaker numbers shall be permanently attached to trim.

2.2 CIRCUIT BREAKERS

A. Circuit breakers shall be quick break, quick make, thermal magnetic type, for alternating current. Breakers shall trip free for the handle and tripping shall be indicated by the handle assuming a position between OFF and ON.

B. Circuit breakers shall be of the bolt-on type.

C. Multi-pole breakers shall be internal common trip with single operating handle; external handle ties are not acceptable, unless specifically noted otherwise (such as for multi-wire branch circuits described below).

D. Circuit breakers feeding multiwire branch circuits (as defined by NEC) consisting of separate single phase loads sharing a common neutral shall be provided with multi-pole breakers or handle ties to simultaneously disconnect all ungrounded conductors per NEC Article 210.4(B). The necessary locations of these multi-pole breakers or handle ties shall be coordinated by the contractor. Where necessary, the contractor may rearrange circuit breakers (as minimally as possible) as required to meet this requirement.

E. All breakers shall meet the minimum RMS symmetrical interrupting capacity ratings shown on plans for the associated panel. All interrupting ratings shall be full ratings. Series ratings will not be allowed unless shown otherwise on drawings.

F. All branch circuit breakers shall be listed to UL489 or shall be specially-tested to be HACR listed.

2.3 SPECIAL REQUIREMENTS

A. Any special requirements on the drawings, such as for increased interrupting rating, ground fault protection, etc., shall supersede these specifications, but only insofar as that particular requirement is concerned.

B. Lighting panels larger than 400A shall conform to the requirements for power panels.

C. Panelboards installed in exterior or wet locations shall have NEMA 3R enclosures.

2.4 MANUFACTURER

A. Panelboards shall be as manufactured by Square 'D', G.E., Siemens or Cutler Hammer.

PART 3 - EXECUTION

3.1 INSTALLATION
A. All panelboard dimensions and clearances shall be carefully checked and coordinated with the proper trades to insure proper mounting space and support prior to roughing in equipment. In no case shall any circuit breaker be located above 6’-7” A.F.F..

B. Wiring in panelboard wireways shall be done in a neat and workmanlike manner. Wiring shall be grouped into neat bundles and secured with approved tie wraps.

C. For all flush-mounted panelboards, a minimum of three (3) one-inch empty conduits shall be stubbed out above the nearest accessible ceiling space for future use.

3.2 PANEL IDENTIFICATION

A. Refer to Specification Section 16075.

END OF SECTION 16442
SECTION 16511

LIGHTING MATERIALS AND METHODS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Luminaires
B. Ballasts
C. Stems
D. Lamps

PART 2 - PRODUCTS

2.1 GENERAL

A. Fixtures shall be furnished as shown on plans and specified herein. It shall specifically be the responsibility of Contractor to verify exact type ceiling and recessing depth of all recessed fixtures and furnish the specific mounting trims and accessories of the specified and/or accepted fixture specifically for the ceiling to be installed.

B. Fluorescent fixtures, unless otherwise noted, shall be so designed and have ballasts installed so as to function without interruptions when operating in the following temperature conditions:
   1. All fixtures: In a room ambient temperature of 80 degrees Fahrenheit (minimum) unless higher temperature is noted on plans.
   2. All recessed fixtures: In a plenum ambient temperature of 110 degrees Fahrenheit (minimum).
   3. All recessed fixtures on single story buildings and on upper floors of multi-story buildings: In a plenum temperature of 140 degrees Fahrenheit (minimum).

C. All fixtures installed in fire rated ceiling enclosures shall be labeled as suitable for that purpose.

2.2 STEMS/PENDANTS

A. Hangers shall be approved ball aligner type swivel, 30 degrees from vertical with swivel below canopy.

B. Stems/Pendants shall be rigid or IMC conduit unless specified otherwise on plans. Proposed stem/pendant types shall be submitted for review prior to shipment of light fixtures from factory.

C. Shall be painted the same color as the fixture trim unless noted otherwise.

2.3 BALLASTS/DRIVERS
A. Unless shown otherwise on plans, all fluorescent ballasts shall be electronic type with 10% maximum harmonic distortion and shall be approved by E.T.L. and have U.L. and C.B.M. label, be high power factor and have a noise level rating in accordance with I.E.S. recommendations. Fluorescent ballasts shall conform to temperature requirement noted under fixture above.

B. All T8 and T5HO ballasts shall be programmed-start type with parallel wiring (Philips/Advance Optanium #PSP or equal by GE).

C. All HID ballasts shall be of the pulse-start super constant wattage autotransformer type (SCWA) or electronic type. Reactor-type HID ballasts are unacceptable.

D. Each ballast/driver shall be properly protected by fusing, internal or external to the ballast/driver assembly. Where required by the authority having jurisdiction, provide HLR/GMF fusing of proper size and rating external to each individual ballast. All fuses for fixtures mounted on steel or aluminum poles shall be mounted in handhole near fixture base. Contractor shall verify requirement with authority having jurisdiction prior to submitting shop drawings.

2.4 LAMPS

A. Furnish and install 125 volt inside frosted incandescent lamps of proper wattage for all incandescent outlets designated on drawings unless shown otherwise.

B. Furnish and install fluorescent and H.I.D. lamps of proper size and type as shown on drawings.

C. All lamps shall be installed new, immediately prior to final inspection and shall not be used for construction purposes.

D. The guarantee-warranty shall apply to lamps as follows:
   1. Fluorescent and HID Lamps; Contractor shall be guaranteed for one (1) full year.
   2. Incandescent lamps shall be guaranteed for one (1) month.
   3. All Quartz Lamps shall be guaranteed for six (6) months.
   4. Guarantee shall begin from date of final acceptance.

2.5 MANUFACTURER

A. Fixtures and stems shall be manufactured as shown in fixture schedule or approved equals.

B. Ballasts shall be as manufactured by Philips/Advance, GE, Magnatec, Motorola or approved equal.

C. Lamps shall be as manufactured by General Electric, Sylvania, Philips or equal.

PART 3 - EXECUTION

3.1 INSTALLATION OF LIGHTING FIXTURES

A. Support:
1. Support of all lighting fixtures shall be responsibility of electrical contractor. All lighting fixture supports shall be installed in accordance with lighting fixture supplier’s recommendations.

2. Fixtures shall be supported independent of ceiling from structural members of building.

3. Lay-in fixtures shall be supported by four (4) taut 12 gauge hanger wires connected from each corner of the fixture to the structure above so that fixture is supported independent of the ceiling.

4. Other recessed light fixtures (including recessed downlights) shall be supported with two (2) taut 12 gauge hanger wires connected from opposing corners of the light fixture to the structure above so that fixture is supported independent of the ceiling.

5. Pendant mounted fixtures shall be directly supported from the structure above using a 9 gauge hanger wire or an approved alternate support without using the ceiling suspension system for direct support.

6. Tandem fixtures may utilize common hanger wires.

7. All lay-in fixtures shall be attached to ceiling grid by means of approved clips and in accordance with the N.E.C.

8. Contractor shall submit typical hanging detail to Engineer before installing any fixtures.

B. Connections:

1. All grid fixtures shall be wired by flex individually to junction and not wired fixture to fixture.

2. All flex shall contain 3 conductors (3rd wire ground). Ground wire shall be securely grounded at each end. Other conductors shall be connected by approved connectors.

C. Row-Mounted fixtures:

1. All stems on row-mounted fluorescent fixtures shall be installed as follows (except fixtures with slide grip hangers):
   a. One stem shall be installed in the first fixture knockout from end of row (on the first and last fixture of the row).
   b. One stem shall be installed between each two fixtures. Stem shall center joint where fixtures join and shall attach by use of “joining plates”.

2. All fixtures in continuous rows other than recessed grid type shall be connected by nipples with locknuts bushings.

D. Coordination:

1. Contractor shall coordinate all dimensions & locations of light fixtures prior to rough-in to insure proper fit and coordination with other trades.

2. Contractor shall verify exact ceiling types being installed and shall adjust fixture trim types accordingly (prior to submitting light fixture shop drawings).

3.2 SPARE LAMPS

A. Turn over to Owner a minimum of one of each type lamp used. In addition turn over to Owner one spare lamp for each ten (10) or major factors thereof used, up to a maximum of 20 for any one type and size.

END OF SECTION 16511
SECTION 16721

FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 SCOPE

A. The Contractor shall furnish and install a complete low voltage, automatic and manual fire alarm system as specified herein and indicated on the drawings.

B. The system shall include a central control panel, power supply, signal initiating devices, audible and visual alarm devices, a conduit and wiring system and all necessary accessories required to provide a complete operating system.

C. The system shall be completely addressable.

D. The system shall comply with the applicable provisions of the National Fire Protection Association Standard Number 72 (National Fire Alarm Code) for fire alarm systems; N.E.C. Article 760; and meet all requirements of the local authorities having jurisdiction.

E. The system shall be provided by a local service organization located within 50 miles of the job site.

1.2 DESCRIPTION OF SYSTEM

A. Conduit, outlet boxes, cabinets, devices and wiring installation for complete fire detection and alarm system.

B. Each and every item of the Fire Alarm System shall be listed as a product of a SINGLE fire alarm system manufacturer under the appropriate category by Underwriter's Laboratories, Inc. (UL), and shall bear the "UL" label. All control equipment shall be listed under UL category UOBZ as a single control unit. Partial listing shall not be acceptable. System controls shall be UL listed for Power Limited Applications per N.E.C. Article 760. All circuits shall be marked in accordance with N.E.C. 760-23.

C. Wiring shown is diagrammatic to define system and is not intended to show every wire. Review drawings prior to bidding and inform Contractor of any additional wiring necessary for installation of systems. Include cost of all wiring in bid.

D. Submit complete shop drawings of system for review including terminal to terminal connection diagrams for system components and associated equipment interfaces, conduit diagrams, complete descriptive information on each item of equipment including UL listing for all system components, and any other information required by Architect to describe system. Identify color code and terminal numbers on shop drawings.

E. After completion of work, submit one set of record mylar sepias with items for Owner described above. Typical type drawings will not be accepted.
F. Manufacturer's trained technical representative shall supervise installation, connections and tests. The authority having jurisdiction shall be notified prior to installation or alteration of equipment or wiring. Before acceptance, manufacturer's representative will test and certify in writing that system is installed and functioning properly as intended by drawings and specifications. Test includes operation of all devices in entire system.

G. Guarantee entire system in writing for one year from date of acceptance by Owner. Guarantee will cover completely all components, equipment, wiring, etc. Repair any defects found in the system within the guarantee period without cost to owner.

H. Submit with bid a guaranteed price for complete maintenance and service of system for one year beginning at expiration of guarantee period. Price shall be guaranteed for acceptance by Owner until date of substantial completion of system.

1.3 SYSTEM OPERATION

A. Actuation of any alarm initiating device shall cause all audible alarm signals to sound, all visual indicating appliances to flash, activate an alarm LED and local tone-alert at control panel/annunciator, cause an LCD read-out of point in alarm including type of alarm (smoke detector, manual station, etc.), provide a signal to the mechanical controls to shut down or re-route air handling systems according to established plans. This shall include a suitable addressable relay at each air handling unit to shut down all air handlers in a given zone when system goes into alarm.

B. The general alarm devices may be silenced by authorized personnel only, by entering a locked cabinet and operating the proper silencing switch. A subsequent zone alarm shall reactivate the signals. Operation of the silencing switch shall be indicated by a trouble light and audible signal.

C. Operation of any sprinkler monitoring switch, power failure, opens, grounds, or any disarrangement of the system wiring or components shall be indicated by a visual and audible trouble signal. The audible trouble signal may be silenced; however, the trouble LED shall remain lit until the system has been returned to normal operating condition.

D. Analog Smoke Sensor Operation
1. The smoke sensor shall be a smoke density measuring device having no self contained alarm set-point. The alarm decision for each sensor shall be determined by the control panel. The control panel shall determine the condition of each sensor by comparing the sensor value to stored values.

2. The control panel shall maintain a moving average of the sensors smoke chamber value. Systems that do not automatically maintain a constant smoke obscuration sensitivity for each sensor by compensating for environmental factors and are deemed unacceptable.

3. The system shall automatically indicate when an individual sensor needs cleaning. When a sensor’s average value reaches a predetermined value, a “Dirty Sensor” trouble condition shall be audibly and visually indicated at the control panel for the individual sensor. Additionally, the LED on the sensor base shall glow steady giving a visible indication at the sensor location.
4. If a “Dirty Sensor” is left unattended, and its average value increases to a second predetermined value, an “Excessively Dirty Sensor” trouble condition shall be indicated at the control panel for the individual sensor.

5. The control panel shall automatically perform a daily self-test on each sensor. Checking the electronics in the sensor’s base ensures the accuracy of the values being transmitted to the control panel. A sensor which fails the self-test will cause a “Self Test Abnormal” trouble condition at the control panel. A sensor self-test which must be manually initiated by the operator shall not be acceptable.

1.4 SYSTEM FEATURES

A. The fire alarm system shall include the following features as a minimum:

1. Supervision of all field wiring.
2. Microprocessor based solid state modular construction.
3. Ground fault detection and ground fault isolating & supervising circuitry.
4. 80 character LCD display to indicate alarms, supervisory service conditions and troubles.
5. Simultaneous test of all LED's and LCD's from a central point.
6. "Dead Front" design control panel/annunciator with field programmable LED alarm, status and trouble indicators, and all control switches located behind a locked tempered glass door.
7. Fully automatic battery charger and lead alkaline batteries. Batteries shall have capacity to maintain system operation for 24 hours in normal supervisory mode and shall have sufficient capacity remaining to operate in alarm mode for 15 minutes at conclusion of supervisory period. Batteries shall be supervised for connection to the system and for low voltage threshold. Ammeter and voltmeter shall be provided to indicate battery voltage and charging current.
8. Two (2) sets of 2 amp form C auxiliary alarm contacts fused with feedback.
9. One (1) set of 2 amp form C auxiliary trouble contacts.
10. Standard with 99 addressable points (expandable to 250 points) and four input/output (I/O) circuits (expandable to 20 circuits).
11. Basic four (4) amp power supply (expandable as required).
12. 600 event historical logging.
13. System shall be field programmable for offsite monitoring by remote station reverse polarity, local energy master box or shunt master box types.
14. System shall be field programmable for signal circuit type of operation; march time code, temporal code, selective code, zone code, general alarm, time limit cutout and alarm silence inhibit.
15. System shall be field programmable for waterflow/sprinkler supervisory operation on distinct zones as required.
16. Transient suppression protection shall be provided on the system power supply and on the municipal protection circuit to comply with UL 864 requirements. Additionally, surge suppression shall be provided within the control panel on all circuits that extend outside the building (including to roof-mounted HVAC units).
17. Supervised remote annunciator connection circuit.
18. System shall incorporate an alarm/trouble walk test.
19. Resident non-volatile programmable operating system memory for all operating requirements.
PART 2 - PRODUCTS

2.1 FIRE ALARM CONTROL PANELS/ANNUNCIATORS

A. Furnish and install Simplex type 4010-9101 fire alarm control panel(s) with options and accessories as required.

2.2 MANUAL ALARM STATIONS

A. Manual alarm stations shall be Simplex addressable type 4099-9002 break glass (double-action). The station body shall be so constructed that chips and scratches will not expose metal. All stations shall be master keyed with the control equipment. When actuated, the "Pull Lever" shall remain at right angle to the station body until reset.

B. Boxes:
   1. Recessed, two-gang outlet boxes with Simplex type 2099-9813 red, semi-flush trim plates shall be used where possible.
   2. Where surface-mount outlet boxes are required, boxes shall be red, cast aluminum Simplex type 2975-9022.

2.3 PHOTOELECTRIC SMOKE SENSOR

A. The smoke sensors shall be of the photoelectric addressable Simplex type 4098-9714 and shall communicate actual smoke chamber values to the system control panel. The smoke sensors shall operate on the light scatter principle. For maximum maintenance free service and low power requirement, light source for detection chamber and visual alarm indication shall be solid state photodiode.

B. Each sensor base shall be visually and electrically supervised.

C. The sensors shall be listed to UL Standard 268 and shall be documented compatible with the control equipment to which they are connected. The sensors shall be listed for both ceiling and wall mount applications.

D. Each sensor base shall contain integral addressable electronics and an LED that will flash each time it is scanned by the control panel (once every 4 seconds). The control panel shall be responsible for drift compensation. When the control panel determines that a sensor is in an alarm or a trouble condition, the control panel shall command the LED on that sensor’s base to turn on steadily indicating the abnormal condition. Sensors which do not provide a visible indication of an abnormal condition at the sensor location shall not be acceptable. Sensor bases shall be compatible with detachable photoelectric, ionization and heat sensors so that these various sensor types can be easily interchanged to meet specific location requirements. Sensor base shall be addressable type as required.

E. Where required, sensor bases shall be provided with a relay driver output and supervised relay, which are to be controlled either automatically or manually from the control panel.

F. Each sensor base shall be scanned by the control panel for its type identification to prevent inadvertent substitution of the wrong sensor type. The control panel shall operate with the installed device but shall initiate a “Wrong Device” trouble condition until the proper type is
installed or the programmed sensor type is changed.

G. Each sensor shall contain a magnetically actuated test switch to provide for easy alarm testing at the sensor location.

H. The sensor’s electronics shall be immune from false alarms caused by EMI and RFI.

I. Cover all smoke detection devices with plastic bags immediately after installation to maintain cleanliness, if field conditions so require.

J. Provide a U.L. listed sensor guard for sensors in areas subject to tampering. The guard shall be suitable for ceiling or sidewall mounting and hinged for easy access. The guard shall be securely mounted with tamper-proof screws.

2.4 PHOTOELECTRIC DUCT DETECTOR

A. The detector shall be an addressable, non-polarized 24VDC, Simplex type 4098-9755, which is compatible with the Fire Alarm Control Panel and obtains its operating power from the supervisory current in the fire alarm detection loop. It shall be of the same analog type as the ceiling smoke detectors. Detectors shall be of the solid state photoelectric type and shall operate on the light scattering, photodiode principle. To minimize nuisance alarms, detectors shall have an insect screen and be designed to ignore invisible airborne particles or smoke densities that are below the factory set alarm point. No radioactive material shall be used.

B. The detector head shall be directly interchangeable with an ionization detector type. The 24VDC detector may be reset by actuating the control panel reset switch.

C. Detector construction shall have a mounting base with a twist-lock detecting head that is lockable. The locking feature must be field removable when not required. Contract between the base and head shall be of the bifurcated type utilizing spring type, self-wiping contacts. Removal of the detector head shall interrupt the supervisory circuit of the fire alarm detection loop and cause a trouble signal at the control panel.

D. Sampling tubes sized to match duct size as recommended by equipment manufacturer shall be provided with duct detectors as required.

E. Detector design shall provide compatibility with other normally open fire alarm detection loop devices (heat detectors, pull stations, etc.). It shall be possible to alarm the duct housing by using a test switch. For maintenance purposes, it shall be possible to clean the duct housing sampling tubes by accessing them through the duct housings front cover.

F. To minimize false alarms, voltage and RF transient suppression techniques shall be employed as-well-as smoke signal verification circuit and an insect screen.

G. Separate auxiliary SPDT relays for fan shutdown shall be provided with each duct detector for fan shutdown, smoke evacuation or other purposes as indicated on plans.

H. Remote key operated test stations with LED alarm indicators shall be installed in an accessible, inconspicuous location for each duct detector.
I. Duct detectors shall be installed for the equipment as indicated on plans as follows (locations shown on plans are diagrammatical only):
   1. A minimum of six duct widths downstream from bends or inlets to avoid air turbulence.
   2. On the downstream side of filters to detect fires in the filters.
   3. In return ducts, ahead of mixing areas.
   4. Upstream of air humidifier and cooling coil.
   5. With accessibility for test and service.

J. The following duct detector locations shall be avoided:
   1. Where dampers closed for comfort control would interfere with airflow.
   2. Next to outside air inlets (unless the intent is to monitor smoke entry from that area).
   3. In return air damper branch ducts and mixing areas where airflow may be restricted.

K. Where duct detectors are installed in exterior or wet locations, weatherproof duct housing enclosures shall be provided to protect the detectors. Enclosures shall be located to be in shaded areas rather than direct sunlight. Entire installation shall be as directed by the equipment manufacturer.

2.5 HEAT SENSORS

A. Heat sensors shall be U.L. listed, addressable Simplex type 4098-9733. They shall provide rate-of-rise temperature sensing, fixed temperature sensing (135 degrees F) and utility temperature sensing (32 degrees F to 155 degrees F range).

B. Each sensor base shall be visually and electrically supervised.

C. The sensors shall be listed to UL Standard 268 and shall be documented compatible with the control equipment to which they are connected. The sensors shall be listed for both ceiling and wall mount applications.

D. Each sensor base shall contain integral addressable electronics and an LED that will flash each time it is scanned by the control panel (once every 4 seconds). The control panel shall be responsible for drift compensation. When the control panel determines that a sensor is in an alarm or a trouble condition, the control panel shall command the LED on that sensor’s base to turn on steady indicating the abnormal condition. Sensors which do not provide a visible indication of an abnormal condition at the sensor location shall not be acceptable. Sensor bases shall be compatible with detachable photoelectric, ionization and heat sensors so that these various sensor types can be easily interchanged to meet specific location requirements. Sensor base shall be addressable type as required.

E. Where required, sensor bases shall be provided with a relay driver output and supervised relay, which are to be controlled either automatically or manually from the control panel.

F. Each sensor base shall be scanned by the control panel for its type identification to prevent inadvertent substitution of the wrong sensor type. The control panel shall operate with the installed device but shall initiate a “Wrong Device” trouble condition until the proper type is installed or the programmed sensor type is changed.

G. Each sensor shall contain a magnetically actuated test switch to provide for easy alarm testing.
at the sensor location.

H. The sensor’s electronics shall be immune from false alarms caused by EMI and RFI.

I. Heat sensor shall be automatically restorable.

2.6 MAGNETIC DOOR HOLDERS

A. Provide Simplex type 2088 series magnetic door holders as required where shown on plans.

2.7 ALARM SIGNALS (AUDIBLE)

A. Horns:
   1. Alarm horns shall be Simplex type 4901-9820. The horns shall be polarized and shall be operated by 24 VDC. Each horn assembly shall include separate wire leads for in/out wiring for each leg of the associated signal circuit. T-tapping of signal device conductors to signal circuit conductors shall NOT be accepted. Where horns are shown as a combination audio-visual assembly, they shall be mounted as a combination unit in a single back box (4903 series). Horns shall be capable of producing 95 dB.

B. Electronic Chimes:
   1. Electronic chimes shall be Simplex type 2902 series. The chime shall be polarized and shall be operated by 24 VDC with a minimum of 82 dB at 10 ft. Adaptors shall allow surface, semi-flush, weather resistance, or audio/visual mounting as shown on the plans.
   2. Chimes shall have field adjustable volume control. They shall be provided with four (4) connections to insure properly supervised in/out system connection. Chime shall be U.L. listed for its intended purpose. Where chimes are shown as a combination audible-visual assembly, they shall be mounted as a combination unit with an adapter in a single back box.

C. Devices required to be surface mounted shall be furnished with Simplex type 2975-9145 surface mounting box and 4905-9903 adaptor plate.

D. Devices installed in areas subject to mechanical damage (ie. gymnasiums) shall be furnished with suitable wire guards as indicated on plans.

2.8 ALARM SIGNALS (VISUALS)

A. Visual Flashing Lamps (Xenon Strobe):
   1. Furnish and install per plans and specs Simplex type 4904 series visible appliance for fire alarm system notification. The appliance shall be 1HZ synchronized (15cd, 30cd, 110cd) with polar distribution or 75 cd illumination as required by the Americans with Disabilities Act (ADA). The appliance shall be U.L. listed to Standard 1971 and have a circumpolar light output allowing mounting in either vertical or horizontal positions or on the ceiling.
   2. The light unit shall be of ABS polycarbonate and the lens of high grade, optical quality LEXAN. For optimized light distribution, the xenon flash tube shall be installed perpendicular to the appliance’s back plane. A special compound reflector shall be utilized to maximize and best distribute the light pattern in key axis directions.
   3. The effect of the illuminated visible appliance shall be observable in a circumpolar pattern. The visible appliance shall be labeled with the word “FIRE” in a contrasting color and the
height of each character shall be a minimum of 5/8 inches. In its quiescent state, the word “FIRE” shall be visible.

4. Mounting heights of visual appliances shall in all respects comply with the Americans with Disabilities Act.

5. Visual indicating appliances shall be Simplex type 4904 series and comprised of a Xenon flash tube and be entirely solid state. These devices shall be U.L. listed and be capable of either ceiling or wall mounting. The LEXAN lens shall be pyramidal in shape to allow better visibility. Visual units shall be of the stand alone type.

2.9 REMOTE ANNUNCIATOR

A. Where shown on the plans, provide and install an LCD annunciator. The annunciator(s) shall have a beige enamel finish and shall provide the same functionality as the main control panel front panel display. The annunciator shall communicate to the control panel over one twisted shielded pair of wire and operating power shall be 24VDC and be fused at the control panel. Point-wired annunciators will not be considered as equal.

B. The serial annunciator shall provide a common alarm and trouble circuit consisting of:
   1. Control push-button switches – for alarm silence, trouble silence, system reset and manual evacuation duplicating the control panel switches. A key “enable” switch shall be provided to activate or deactivate the control switches.
   2. Tone Alert – Duplicates the control panel tone alert during alarm and trouble conditions.
   3. System trouble LED.
   4. Power on LED.

C. To accommodate and facilitate job site changes the control switches shall have the capability to be programmed on site to provide for manual switch input operation other than their standard purpose.

2.10 SPRINKLER FLOW SWITCHES

A. Sprinkler flow switches and supervisory switches are provided under another section of these specifications. This contractor shall be responsible for electrical connection of these devices to the fire alarm system.

2.11 SMOKE DAMPERS

A. Smoke dampers are provided under another section. This contractor shall be responsible for supplying a source of power and connecting them to the fire alarm system to close on alarm.

2.12 OFF SITE MONITORING

A. Furnish all material and labor to accomplish and coordinate with local company or fire department as necessary for off site monitoring of the Fire Alarm System. Off site monitoring shall be in operation prior to final acceptance. Exact type of off site monitoring (basic reporting or advanced reporting as described below) shall be provided by the contractor per the owner’s direction.

B. Furnish and install serial digital alarm communicating transmitter (DACT), capable of reporting specific alarm points to the central station. DACT shall be universal in that it can be
utilized to either provide basic reporting (alarm, trouble, supervisory conditions) or more advanced reporting (point-to-point reporting of specific alarm conditions) DACT shall be mounted integral to or beside fire alarm control panel.

2.13 FIRE ALARM CABLEING
1. All fire alarm cabling shall:
2. Have red outer insulation/jacket with ripcord.
3. Be listed and labeled for the intended use in Fire Alarm systems.
4. Be manufactured by West Penn, Allied, Belden or Superior Essex.

2.14 FIRE ALARM SYSTEM MANUFACTURER
A. All equipment shall be listed by UL. All panels and peripheral devices shall be the standard equipment of a single manufacturer and shall display the manufacturer's name on each component. Manufacturer's numbers specified in this section are those of Simplex Time Recorder Company to denote type, quality, material and desired operating features to be furnished.

B. Equipment shall be as manufactured by Simplex, Notifier or EST.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide and install the system in accordance with the plans and specifications, all applicable codes and the manufacturer's recommendations.

B. All wiring shall be installed in strict compliance with all the provisions of NEC - Article 760 A and C, Power-Limited Fire Protective Signaling Circuits or if required may be reclassified as non-power limited and wired in accordance with NEC-Article 760 A and B.

C. Upon completion, the contractor shall so certify in writing to the owner and general contractor.

D. Front surface of all junction box covers in concealed areas (such as above lay-in ceilings) or within mechanical/electrical rooms (and other similar areas where appearance of boxes is not an issue) shall be sprayed red and labeled "Fire Alarm" or "F/A". Covers in exposed areas shall be labeled “F/A” on interior of front cover. Wiring color code shall be maintained throughout the installation.

E. All fire alarm wiring shall be installed in conduit. Conduit shall be sized per manufacturer's recommendations, but in no case shall conduit be smaller than 3/4".

F. Installation of equipment and devices that pertain to other work in the contract shall be closely coordinated with the appropriate subcontractors.

G. All raceways shall be concealed unless specifically shown or approved otherwise.

H. The contractor shall provide 120VAC power to all remote booster power supplies, control panels, transponder cabinets or other similar items as required. Where the project is provided with emergency power from an emergency generator, all power supplies shall be connected to
an emergency source.

I. The contractor shall clean all dirt and debris from the inside and the outside of the fire alarm equipment after completion of the installation.

J. The manufacturer's authorized representative shall provide on-site supervision of installation and shall provide all system setup and programming services.

K. The manufacturer’s authorized representative shall have as a minimum, a NICET LEVEL III certification.

L. Where the fire alarm system is installed in a facility located in the state of Alabama, the fire alarm contractor shall be licensed as a certified fire alarm contractor by the State Fire Marshal’s Office in accordance with Alabama Act 2009-657. The fire alarm contractor shall have a technician with a minimum Nicet Level III certification working in a position of responsibility. All technicians working for the certified contractor shall have a minimum Nicet Level II certification. Any fire alarm contractor wishing to bid on the fire alarm work shall show evidence of certifications at the pre-bid conference.

M. Per NFPA 72, A dedicated branch circuit (or circuits) shall be provided to supply primary power to the fire alarm system. The associated branch circuit breaker shall be furnished with lock-on hardware and shall be identified with red marking as a fire alarm circuit. The location of the circuit disconnecting means shall be permanently identified at the fire alarm control unit.

3.2 TESTING

A. The completed fire alarm system shall be fully tested in accordance with NFPA-72H by the contractor in the presence of the owner's representative and the Local Fire Marshal. Upon completion of a successful test, the contractor shall so certify in writing to the owner and general contractor.

3.3 WARRANTY

A. The contractor shall warrant the completed fire alarm system wiring and equipment to be free from inherent mechanical and electrical defects for a period of one (1) year from the date of the completed and certified test or from the date of first beneficial use.

B. The equipment manufacturer shall make available to the owner a maintenance contract proposal to provide a minimum of two (2) inspections and tests per year in compliance with NFPA-72H guidelines.

3.4 CERTIFICATION & ACCEPTANCE

A. A factory trained representative of the manufacturer shall supervise final testing of the system in accordance with N.F.P.A. Standard 72H-1984 in the presence of a representative of the authority having jurisdiction. Manufacturer’s representative shall be NICET trained and shall have a level III NICET certificate. It shall be subject to the approval and acceptance of the responsible engineer. On completion of the acceptance tests, the Owner or his representative shall be instructed in the operation and testing of the system.
B. The fire alarm system shall be free from defects in workmanship and materials, under normal use and service, for a period of one year from the date of acceptance or beneficial occupancy whichever is earlier. Any equipment shown to be defective in workmanship or material shall be repaired, replaced, or adjusted free of charge.

C. The equipment manufacturer shall be represented by a local service organization, and the name of this organization shall be furnished to the Architect and Owner. The service organization shall be located within 50 miles of the job site. The service organization shall furnish, gratis to the Owner, a one year maintenance warranty contract, effective from the date of final acceptance.

END OF SECTION 16721